HEATHKIT® 1969

22nd year of kit leadership

Over 300 electronic kits—
world's largest selection



Catalog 810/69

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WELCOME TO THE WORLD OF HEATHKIT 1969

It is a pleasure to send you this new 1969 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, model radio control, and home protection systems.

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

D. W. Nurse
President

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

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Why Do Millions Build Heathkit® Electronics?













Creative Fun And Unique Personal Satisfaction

Building your own Heathkit provides a chance to create useful, sophisticated products from your own effort . . . a chance to enjoy a hobby that's a fascinating change from the everyday routine . . . a chance to have fun and relax, to escape from the ordinary. And the greatest thrill comes when you finish your kit and turn it on. You experience that exhilirating sense of self-accomplishment . . . that feeling of personal victory that only comes from doing something you doubted was possible for you to 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 AD-27 Stereo Compact, pp. 56-57, you "earn" as much as $7.50 an hour when you consider the big savings.

A Finished Product With Superlative Performance

Over 550 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 60645
3462-66 W. Devon Ave.
Phone: 312-583-3920

Denver, Colorado 80214
2901 Sheridan Blvd.
Phone: 303-238-2348

Philadelphia, Pa. 19149
6318 Roosevelt Blvd.
Phone: 215-288-0180

Cleveland, Ohio 44129
5444 Pearl Road
Phone: 216-886-2590

Anaheim, California 92805
330 E. Ball Road
Phone: 714-776-9420

Detroit, Michigan 48219
18645 W. 8 Mile Rd.
Phone: 313-535-6480

Rockville, Maryland 20852
(Washington, D.C. area)
5542 Nicholson Lane
Phone: 301-942-4506

Milwaukee, Wisconsin 53216
5215 W. Fond du Lac
Phone: 414-873-8250

Los Angeles, California 90007
2309 S. Flower Street
Phone: 213-749-0261

San Diego, California 92101
1300 Market Street
Phone: 714-234-0293

New York, New York 10036
35 W. 45th St.
Phone: 212-765-4590

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

Network Of Authorized Service Centers

Fully staffed and equipped to service all Heathkit electronics and provide replacement parts. They have been selected on their ability to offer you the same high quality service and attention as our factory service center. And they will handle your problems either over the counter or by mail. If there's one in your area, we suggest you use their facilities for faster attention to your needs.

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

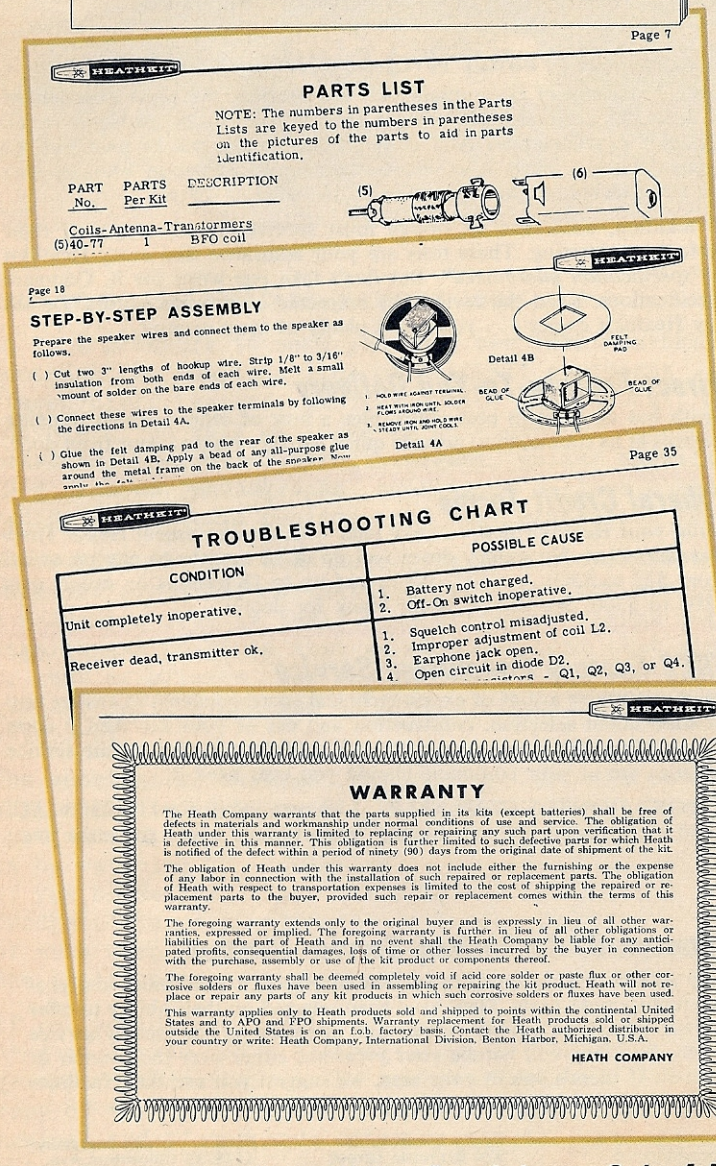
Scientific Radio-TV/Hi-Fi
4122 E. Madison St.
Seattle, Washington
Phone: 322-3215

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

READ WHY YOU CAN BUILD ANY HEATHKIT!

The Key To Your Success... Heathkit® Manuals





1 *"Tips" On Kit-Building*

Each Heathkit contains a 16-page, full color booklet packed with valuable tips for the beginning kit builder. Shows you the tools you need . . . how to unpack and set-up the kit for easy building . . . how to identify components by size, shape and coding. Shows how to mount parts, cut & position leads . . . completely illustrated . . . describes the right and wrong way so you build your first kit like a professional technician. Even explains and illustrates how to properly solder "point-to-point" and on circuit boards so your kit will perform like a factory-built model!

2 *Detailed Parts List*

Inside every Heathkit manual are descriptions and pictures of each and every part for easy identification while you are building your kit.

3 *Simple Step-By-Step Procedure*

Guides you through each assembly step. Tells you exactly what part to use, what to do, and how to do it. Covers kit construction, alignment and installation . . . nothing is left to chance. Written in non-technical, everyday language so everyone can understand.

4 *Large "Exploded" Diagrams*

"King-size" illustrations and "fold-outs" show precisely where each component goes. And many detailed diagrams are generously sprinkled among the instructions to illustrate how various assemblies go together . . . greatly reduces the chance for errors.

5 *Operating Instructions*

Covers the use of your kit under virtually any situation, and recommends appropriate accessories where necessary. Even dwells on operational theory, if required for use. For example, the Heathkit Marine Radio Direction Finder includes a full discussion on the theory of direction finding.

6 *Trouble-Shooting Chart & Service Information*

To err is human, so if you do run into trouble, there's an "In Case Of Difficulty" section and a "Trouble-Shooting chart" that lists difficulties and possible causes to assist you in locating your problem. And our staff of Technical Correspondents is at your service to answer any question about construction, accessories or kit selection. The Service Information section explains procedures for returning kits for factory service, should you ever need it.

7 *Circuit Description And Schematics*

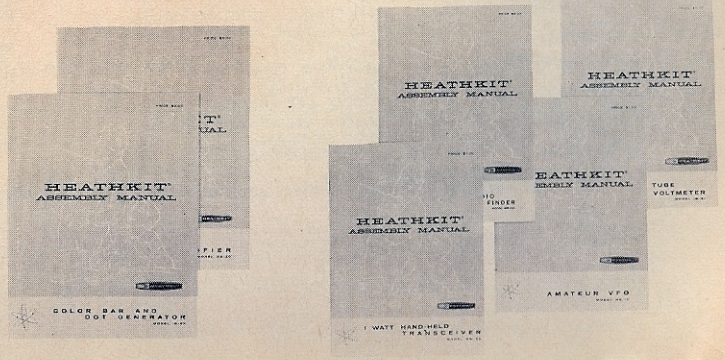
If you are technically inclined or interested in learning about electronics, you'll find the Circuit Description and various circuit diagrams and schematics both helpful and educational.

8 *Heath Warranty*

Heath warrants all kit parts against defects in workmanship and materials for a period of 90 days after shipment.

Convince Yourself How Easy It Is . . . Order A Manual. Its Cost Is Refunded When You Order The Kit

All manuals cost $2.00 (ppd.) except those for EK educational and EF applications series which are $5.00 ppd. each. Just list the model number and write "Manual Only" on the catalog order blank. The purchase price of any manual you order will be credited to your account when that specific kit is ordered. Just retain the manual invoice and return it with your kit order. **IMPORTANT!** As new kits are introduced, some manuals may cost over $2 because of their size—please write for quotation before ordering. Specification sheets, containing complete specifications & schematics, for virtually all Heathkits are available free of charge. Just drop a note or card to "Customer Correspondence" in care of the Heath Company.



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. 30). 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!



4-Speed Solid-State Stereo Portable Phonograph, pg. 22 . . . Finish in 4 Hours



Solid-State FM Stereo Receiver pg. 54 . . . Build in 15 Hours



"Ham" Code Practice Oscillator, pg. 106 . . . Build in 2 Hours



6-Transistor AM Portable, pg. 25 . . . Finish In An Evening



Heathkit Jr. 4-Speed Transistor Portable Phonograph, pg. 23 . . . Assemble in 2 Hours

Thousands Of Beginners Prove You Can Build a Heathkit®

MR. JAMES ADANALIAN, FRESNO, CALIF.: *"This was the first time I have ever assembled any type of electronic equipment (IO-20 Ignition Analyzer). I must say never have I found instructions so easy to follow step by step. The unit was completed so quickly that I couldn't believe my success."*

DR. ALAN M. WHITE, SANTA MONICA, CALIFORNIA: *"Frankly, I was amazed and delighted with the ease and speed with which the work progressed. Each step was so graphically explained that even a rank amateur such as myself had not the slightest bit of trouble. The entire kit . . . from packaging to finished component is beautifully engineered. I am thrilled with the results."*

LEE BLANTON, CINCINNATI, OHIO: *"I am 13 years old and had no help in assembling the GR-64 shortwave receiver. The instructions were very clear and precise. I was quite surprised when I turned the unit on for the first time and it functioned perfectly."*

MR. R. W. ROSEBERRY, JR., SHAWNEE MISSION, KAN.: *"Being a layman in anything electronic, I was somewhat skeptical of my ability to obtain desired results. However, I had absolutely no trouble whatever. The assembly manual left nothing to doubt."*

MR. JERRY ANTONETTI, OROVILLE, CALIF.: *"This was my first experience with electronic kit building and you can be proud of the product you sell. The instructions were very clear and the construction made simple by thorough engineering. The GR-54 shortwave receiver is a beautiful set to look at, and the performance is beyond my expectations."*

MRS. JOSEPH GESSWEIN, BETHESDA, MD.: *(Heathkit color TV owner) "If a housewife with three children under 4 years of age can successfully build it in her few spare moments, it has to be good."*

ERIC C. WELCH, PHILADELPHIA, PA.: *"I had never put together any kind of kit like this before and know almost nothing of electronics. Needless to say it was with great trepidation that I began to work. I've never had so much fun. Your simple directions on soldering had me producing perfect connections every time. Everything was very easy to follow. I didn't really expect it to work but it worked perfectly and the good quality of the sound amazes me."*

FRANK J. ENNIS, MANCHESTER, CONNECTICUT: *"I was quite skeptical when assured that my twin nine year old sons would be able to assemble the HR-10B receiver with little difficulty. I was amazed to find that the step by step instructions were so clearly explained that the boys were able to not only assemble the kit themselves but they were able to read and follow the instructions & diagrams with very little help from me. From the first time the set was turned on they have gotten very good reception."*



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 19¼″ D x 31″ H x 36″ W.

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

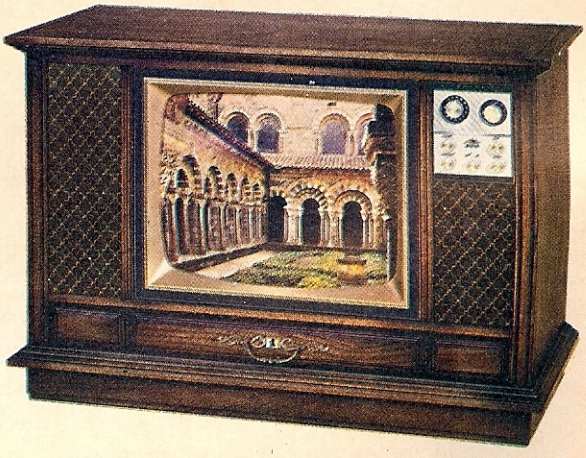




Contemporary Styled Walnut Cabinet **$62.95**

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 34½″ W.

Assembled GRA-295-1, 56 lbs. . . Express or motor freight, no money dn., $7 mo. **$62.95**



NEW! Mediterranean Oak Cabinet **$119.50**

Factory assembled of selected furniture hardwoods, finished in luxurious oak; styled in newest Mediterranean motif. Statuary bronze trim handle. Overall dimensions 45½″ W x 20″ D x 31″ H.

Assembled GRA-295-4, 85 lbs. . . Express or motor freight, no money dn., $11 mo. **$119.50**

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

Deluxe Heathkit® "295" Color TV . . . Now Only $449.95
New 2-Year Picture Tube Warranty & Optional Remote Control

TV Programs Are Better Than Ever . . . More Color, Excitement And Drama . . . And The Heathkit "295" Makes Color TV Viewing A Thrilling New Experience

• 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 • 24,000 volt regulated picture power • Automatic degaussing & mobile degaussing coil • Exclusive built-in servicing aids • Dynamic pincushioning correction circuit eliminates picture edge distortion • Extra B+ boost for improved picture definition • 3-stage video IF strip reduces interference, improves reception • Exclusive Heath "Magna-Shield" improves color purity • Gated Automatic Gain Control (AGC) for steady, jitter-free pictures at all times • Automatic Color Control circuit reduces color fading • Deluxe VHF turret tuner with "memory" fine tuning & 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 prebuilt & aligned • Two VHF antenna inputs . . . 300 ohm or 75 ohm • Circuit breaker protection • 2-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 . . .

HI-FI 90° RECTANGULAR COLOR TUBE with 295 sq. inch viewing area features new rare earth phosphors for brighter pictures and highlights . . . stronger contrast . . . elimination of color fringing . . . and better viewing under normal home lighting conditions. Also features new integral anti-glare protective window.

27-TUBE, 10 DIODE CIRCUIT. Features the highest quality, heavy-duty components, and latest, most sophisticated design to bring you the finest color and black & white pictures. The 24,000 volt regulated high voltage power supply assures sharpness and clarity. Circuit breaker protection.

AUTOMATIC DEGAUSSING CIRCUIT. Demagnetizes and "cleans" the picture every time you turn the set on from a "cold" start. Also eliminates any manual degaussing when you move the set. A "mobile degaussing coil" is included for initial set-up and adjustment.

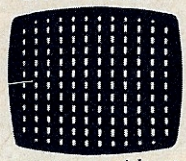
EXTRA B + BOOST. Accelerates the electronic beams for a smaller spot size, high resolution, improved definition and brighter pictures.

DYNAMIC PINCUSHIONING CORRECTION CIRCUIT. Keep the edges straight for a full picture with no distortion.

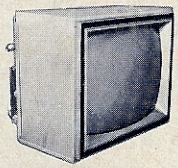
2-SPEED, TRANSISTOR UHF TUNER. Has high vernier ratio for either fast channel selection of all UHF channels or fine tuning of individual stations.

DELUXE VHF TURRET TUNER WITH "MEMORY" FINE TUNING—so you don't have to readjust when you return to a channel. Also features gold alloy contacts for positive switch action. Both channel indicators are lighted for easy reading.

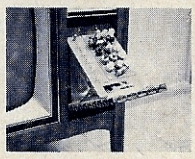
TWO VHF ANTENNA INPUTS. Choose either 300 ohm balanced, or 75 ohm coax input to reduce interference in metropolitan areas and for use in CATV areas.



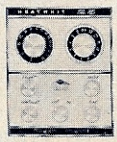
EXCLUSIVE FEATURES THAT CAN'T BE BOUGHT IN READY-MADE SETS AT ANY PRICE. Like built-in servicing aids, so *you* can perform the periodic convergence and color purity adjustments that are required on *all* color TV sets . . . *without* calling in a TV serviceman . . . *without* any technical skills or knowledge. Just flip a switch on the built-in dot generator and a pattern appears on the screen. Simple step-by-step instruction 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.



EASY TO BUILD! 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. 11!

Kit GR-295, all parts including chassis, tubes, mask, UHF & VHF tuners, and special extended-range 6"x9" speaker, 131 lbs. (REA or motor frt.) . . . $45 dn., as low as $27 mo. **$449.95**

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, 6½" W x 7⅞" H x 7" D.

Now, A Choice Of Color TV Remote Controls . . . For All Heathkit Color TV's



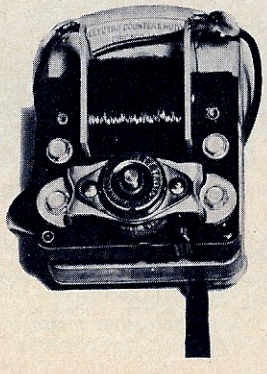
NEW! Wireless Full Color TV Remote Control

Now, control your Heathkit Color TV from the comfort of your easy chair . . . completely electronic (no cables). See page 9 for all the details.

Kit GRA-295-6, 9 lbs., for use with Heathkit model GR-295 and GR-25 color TV's **$69.95**

Kit GRA-227-6, 9 lbs., for use with Heathkit model GR-227 and GR-180 color TV's **$69.95**



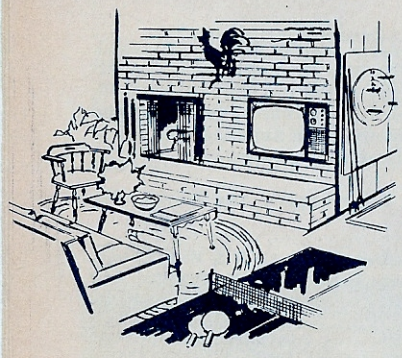


Heathkit Color TV Cable Type Remote Control

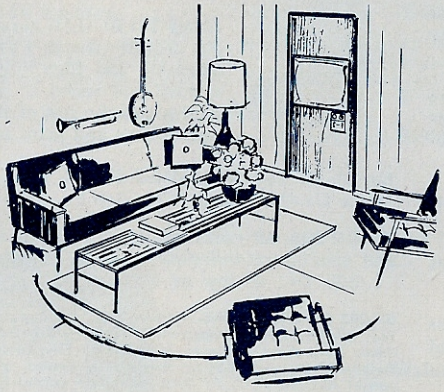
Change VHF channels and turn your Heathkit Color TV on and off from the comfort of your armchair . . . includes 20' flat wire cable. See page 11 for complete details.

Kit GRA-27, 4 lbs. **$19.95**

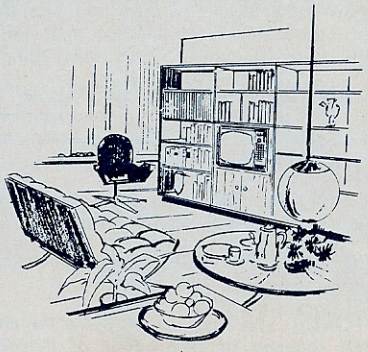
Design Your Own Custom Installation



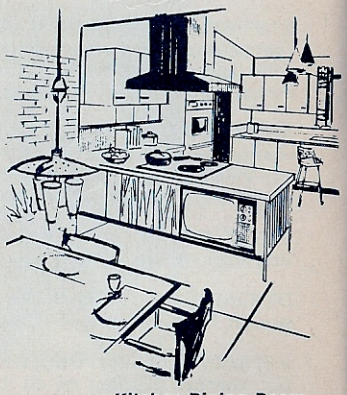
Recreation Room Wall



Closet Door



Book Shelves



Kitchen-Dining Room
Pass-Thru Counter



Contemporary Walnut Cabinet

Factory assembled; fine hardwoods finished in rich walnut. Overall dimensions: 31¾″ W x 29⅝″ H x 19½″ D.
Assembled GRA-227-1, 54 lbs. . . Express or motor freight,
no money dn., $6 mo. **$59.95**



Mediterranean Oak Cabinet

Factory assembled; selected hardwoods; oak finish; Mediterranean styling; bronze handle. Dimensions: 40″ W x 19½″ D x 29″ H.
Assembled GRA-227-2, 70 lbs. . . Express or motor freight,
no money dn., $10 mo. **$99.50**

Heath Has The World's Largest Selection Of Electronic Kits—Over 300 To Choose From

Deluxe Heathkit® "227" Color TV . . . Now Only $399.95
New 2-Year Picture Tube Warranty & Optional Remote Control

Exclusive Heathkit Color TV Features And Versatility Plus Advanced New Circuits Add Up To More Enjoyable TV Viewing And Years Of Complete Satisfaction

• Top quality American brand rectangular color tube with 27 sq. inch viewing area, and anti-glare safety glass • New improved phosphors for brilliant, livelier colors • 27 tube, 12 diode, 1 transistor circuit • 24,000 v. regulated picture power • Automatic degaussing & mobile degaussing coil • Exclusive built-in servicing aids • 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 circuit (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 gold alloy 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 • 2-year warranty on picture tube, 90 days on all other parts

COLOR ADDS A NEW DIMENSION TO TV VIEWING. Now see your favorite programs, exciting sports events, the fabulous TV spectaculars, even news broadcasts in bright, sharp, natural color as only the Heathkit "227" can deliver.

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. And kit assembly helps you become thoroughly familiar with the "227" inside and out; 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 such as tube replacements.

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 to 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" 8 ohm speaker (included) that mount on the right side of the one-piece face mask.

EASY TO ASSEMBLE. 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, and 4" x 6" speaker, 114 lbs. (REA or motor frt.)
$40 dn., as low as $23 mo. **$399.95**

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:** 27 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 7/16" 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! Wireless Remote Control For All Heathkit Color TV's . . . Adds Pleasure and Convenience At Low Cost

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

The Remote Receiver is easy to build . . . on one uncluttered circuit board. An Integrated Circuit is used which consists of 15 Resistors, 10 Transistors, and one Diode. A meter is also built into the receiver for adjustment ease. Installation is also easy . . . you merely mount the 3 motors and the receiver, and connect them together with a plug-in type wire harness.

The Remote Transmitter is electronic (no cables) and is powered by a small conventional 9 v. battery such as used in small transistor radios. The different functions are obtained by simply pushing the proper rocker type knob which operates a set of switches on the transmitter circuit. The transmitter is housed in a small, smartly styled, Beige plastic case . . . feather-light, and fits comfortably in your hand for easy push-button operation.

Kit GRA-295-6, 9 lbs., for use with Heathkit model GR-295 and GR-25 Color TV's, no money dn., $7 mo. **$69.95**

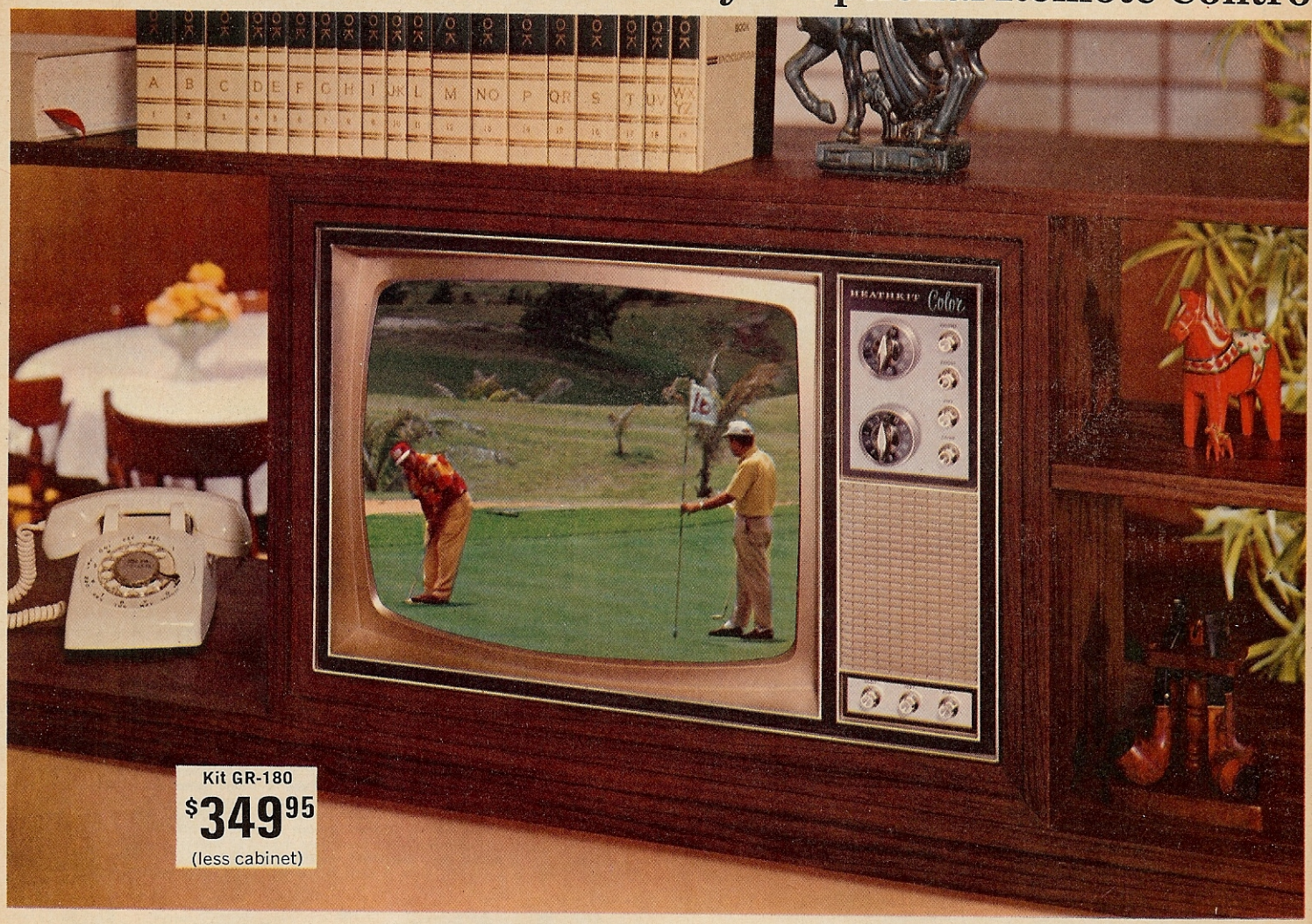
Kit GRA-227-6, 9 lbs., for use with Heathkit model GR-227 and GR-180 Color TV's, no money dn., $7 mo. **$69.95**

SPECIFICATIONS—Switch functions: On-Off Volume, VHF Channel Selector, Color Up—Color Down, Tint Green, Tint Red. **Channel frequencies:** On-Off Volume—40 kHz. VHF Channel Selector—38 kHz. Color Down—44 kHz. Color Up—42 kHz. Tint Red—36 kHz. Tint Green—34 kHz. **Power requirements: Transmitter:** 100 milliwatts @ 9 volts, supplied by a N.E.D.A. type #1604 battery. **Receiver:** 1.5 watts (idling) @ 120 VAC. **Color:** Beige (transmitter case). **Meter:** Receiver adjustment. **Transmitter dimensions:** 4¾" x 3¼" x 1⅜". **Weight: Transmitter:** 8 oz. **Total shipping wt.** 9 lbs.

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

Deluxe Heathkit® "180" Color TV...Now Only $349.95

New 2-Year Picture Tube Warranty & Optional Remote Control



Kit GR-180
$349.95
(less cabinet)

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 31¾" H.

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



Table Model TV Cabinet & Cart

Factory assembled walnut-grained vinyl-clad wood cabinet accommodates GR-180 chassis . . . measures 18⅝" H. x 27⅜" 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 28⅝" x 16⅞", 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**

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

See the World In Living Color— On Heathkit "180" Color TV . . . Now With 2 Year Picture Tube Warranty & Optional Wireless Remote Control

• Top quality American brand rectangular color tube with 180 sq. inch viewing area and 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 • All critical circuits prewired and tested • 2 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 a 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 volt 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.

Kit GR-180, all parts including chassis, tubes, mask, UHF & VHF tuners, mounting kit and special limited-field 4" x 6" speaker, 102 lbs. (REA or motor frt.) . . . $35 dn., as low as $21 mo. **$349.95**

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 9/16" H x 24 3/16" W. **Chassis room:** 17 1/2" H x 26" W x 18" D. 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 NORTHUP, 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 borrowed 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."

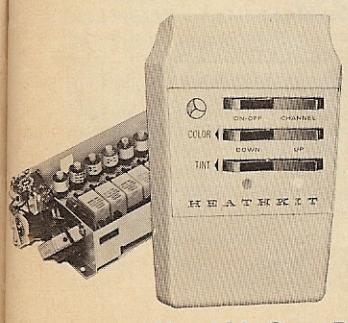
"—the circuitry, features and performance match or exceed those of sets selling at twice the price. Some of the features, such as the built-in servicing aids, can't be bought in ready-made sets at any price."

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 peformance? 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."*

Now Two TV Remote Control Units

New Wireless, Electronic Remote Control Of Your GR-180 With The Heathkit GRA-227-6 TV Remote Control.



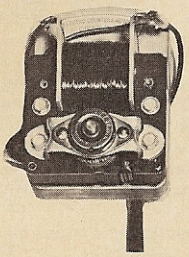




See page 9 for details.

Heathkit Cable Type 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 pushbutton 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**

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

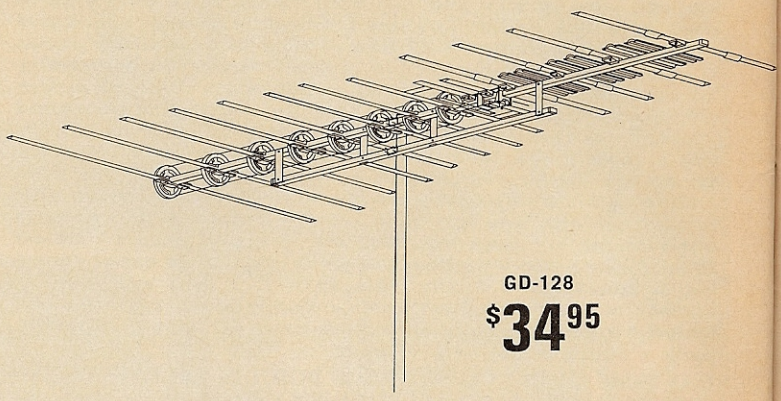
New Heathkit® TV Antennas & Accessories For

Featuring World-Famous Jerrold Antennas Designed Exclusively For Heath

New Heath 3-Way Coaxial Antenna For Deep Fringe Color Reception

• 33 Elements For Peak Performance • Flat Response Across The Entire TV/FM Band • Extra High Gain • Superior Efficiency

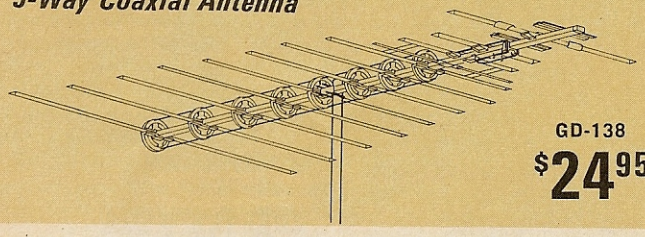
Introducing Heath's new Jerrold-designed UHF/VHF/FM Coaxial antenna for deep fringe areas up to 150 miles, depending on conditions. Performance proven log-periodic coaxial design and extra high gain make this antenna an ideal solution to the problem of good TV and FM reception in areas where lesser antennas would fail. Thanks to its flat response across the entire TV and FM band, color distortion and signal fading are virtually eliminated. High directivity makes it ideal for FM stereo also. The GD-128 comes complete with a low loss 300 to 75 ohm transformer at the antenna and a compact, efficient matching transformer/frequency splitter that separates the VHF and UHF signals at the back of the receiver and matches the set's 300 ohm impedance—this enables you to get maximum performance with only one coaxial down lead. The heavy-duty square boom construction, rugged Cycolac insulators & Golden Armor finish are your assurance of years of trouble-free use, and the positive locking U-bolt assemblies & easy instructions make for quick, simple assembly. For top performance, the use of UHF coaxial 75 ohm cable is a must. Start enjoying distortion free, interference-free TV and FM—order your GD-128 now.



GD-128
$34.95

GD-128, 8 lbs. (119¾") (less mast and coax cable), no money dn., $5 mo. **$34.95**

New! Suburban—Fringe Area 3-Way Coaxial Antenna

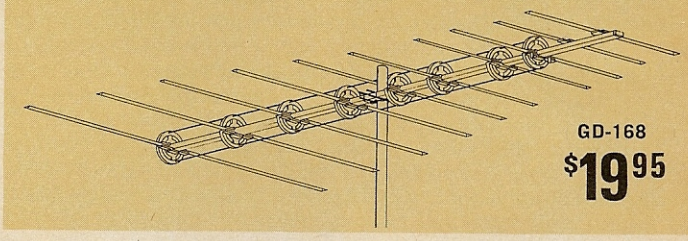


GD-138
$24.95

There's no need to install separate antennas for UHF, VHF and FM—this one will receive all three. A true all-channel coaxial antenna, its 17 elements give it high directivity, to eliminate the problems caused by reception-destroying reflected signals. Its unusually flat response insures the finest in color fidelity. At the receiver, the small and efficient matching transformer/frequency splitter supplied (with the antenna) converts the coaxial cable impedance to the set's 300 ohm input impedance and separates the VHF & UHF signals. Built to last, it has tough Cycolac insulators, square boom construction and corrosion resistant Golden Armor finish. All elements snap into position for easy assembly.

GD-138, 6 lbs. (110¼" L.) no money dn., $5 mo. **$24.95**

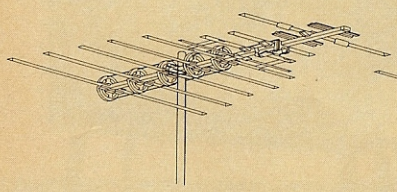
New! VHF/FM Suburban-Fringe Coaxial Antenna



GD-168
$19.95

For uncompromising VHF B&W and color TV and stereo FM reception, this antenna is ideal in suburban-near fringe areas—up to 60 miles depending on conditions. Features 10 elements for very high gain, sharp directivity, flat response and a precise impedance match to achieve the very best performance from your set. Uncompromising Jerrold-designed construction too—rugged square booms, positive locking U-bolts, tough, corrosion-resistant Golden Armor finish and almost indestructable Cycolac insulators. Easy assembly too, with the simple instructions and snap-into-place elements. Because of its superior characteristics, coaxial cable is recommended when installing this antenna. A 300 to 75 ohms transformer comes with the antenna.

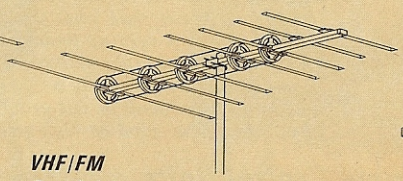
GD-168, 5 lbs. (99½" L.) (less mast & coaxial cable). **$19.95**



Metro-Suburban UHF/VHF/FM Coaxial Antenna

A superior performer for all 82 TV channels plus FM out to 40 miles under usual conditions. Top quality Jerrold design assures you of peak performance for many years. 14 elements give the high directivity required to eliminate reflected signals and the flat response necessary for sparkling color fidelity. Sturdy construction, corrosion resistant finish and easy assembly make this an exceptional value. Coaxial cable recommended.

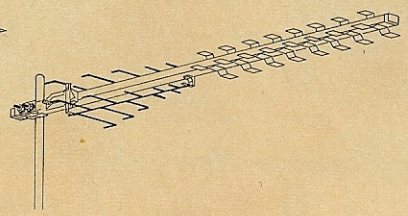
GD-148, 4½ lbs. (66½" L.) (less mast and coaxial cable). . . . **$19.95**



VHF/FM Coaxial Antenna For Suburbs Or City

An inexpensive and effective way to improve your VHF and FM reception. Under normal conditions the 7 element GD-178 will function admirably up to 60 miles from the signal source, and its highly directional qualities and very flat response guarantee better color fidelity and elimination of distortion. Built to stay up where other antennas fail too—Jerrold's years of design experience insure it. Coaxial cable is the best way to install this low priced top flight antenna. Matching transformer included.

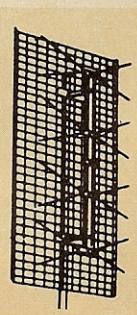
GD-178, 4 lbs. (55¼" L) (less mast and coaxial cable). **$14.95**



Periodic-Type UHF Coaxial Antenna For Channels 14-83

A high gain, broadband periodic type UHF antenna especially designed for Heath by Jerrold for outstanding deep fringe color reception of channels 14 through 83. Features a 75-ohm coaxial output for use with all-channel coaxial cable. May be combined with any existing VHF antenna without going to the added expense of a combiner. Easy installation and rugged construction.

GD-188, 5 lbs. (less mast and coaxial cable) **$9.95**



High Quality UHF At A Very Low Cost

A high quality 300-ohm UHF antenna at an economy price. Receives all UHF channels (14-83) with high gain and excellent front-to-back ratio for rejection of unwanted signals. Ruggedly constructed of heavy galvanized steel mesh screen reflector for years of dependable, trouble-free performance. Open "V" type with pivot mount for locking to existing mast.

GDP-233, 5 lbs., less mast. **$5.14**

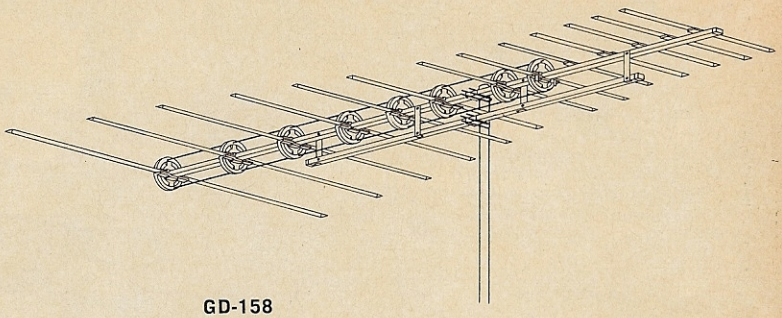
Better Reception Of Color And B&W TV or FM

New! High Performance VHF/FM Coaxial Antenna . . . Receives Up To 150 Miles Away

• Flat Response To Eliminate Phase Shifts • Very Sharp Directivity • High Gain • Last A Lifetime Construction

A 17 element antenna ideal for use in sections that suffer from distortion and poor color due to low signal levels and phase shifting, the GD-158 is of log-periodic design and manufactured exclusively for Heath by the world famous Jerrold Company. The very high gain, pinpoint directivity, extremely flat response and precise impedance match all add up to make this antenna a very able performer in the VHF/FM bands up to 150 miles away under normal conditions. And it's built to take the kind of weather demands usually made on antennas in outlying areas—solidly built with heavy duty square boom construction, Cycolac insulators, rust and corrosion resistant Golden Armor finish and positive locking U-bolts, it'll last much longer than other antennas. The 8 driven and 9 parasitic elements snap into position for quick and easy installation and the simple instructions make it even easier. 75-ohm coaxial cable is recommended for installation of the GD-158 because of its very positive effect on overall reception. Matching transformer is included.

GD-158, 7½ lbs. (120" L) (less mast & coaxial cable)
no money dn., $5 mo. **$24.95**



GD-158
$24.95

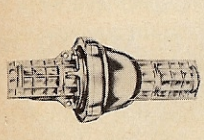


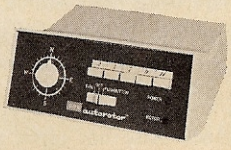
GD-248
$109.95

New! Heathkit 4-Way Coaxial Distribution Kit . . . Delivers An Amplified, Undistorted TV & FM Signal To Four Rooms At Once

Now you can enjoy your favorite B&W and color TV or FM stereo program in any room in your house, with the new Heathkit All Channel Coaxial Distribution System. The heart of the system is the Jerrold TAC-4 distribution amplifier which takes a single coaxial input from any all-channel antenna (such as the GD-128, -138 or -148), amplifies all signals and gives four coaxial outputs to feed four outlets anywhere in the house. Signal level at each of the four outputs is actually greater than the original antenna signal! Each line terminates at a surface-mounted outlet box or mount them flush in standard electrical wall boxes if desired. Connections to the TV or FM set are made via coaxial cable, with a matching transformer/frequency splitter for the rear of the set providing the necessary impedance match and UHF/VHF separation. The kit supplies everything you need for a complete installation—200 ft. of UHF color coaxial cable, connectors and a connector crimping tool. If these quality Jerrold components were bought separately, they would cost over $165. This system is the answer for those who want unparalleled color TV and FM reception throughout the house, at a reasonable price. Complete instructions included.

GD-248, 12½ lbs. . . no money dn., $11 mo. **$109.95**





New! Cornell-Dubilier AR-33 Pushbutton Antenna Rotator

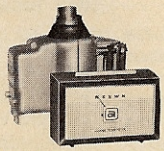
A unique advancement in antenna rotor design. The solid-state control can be operated either by dial or set-and-forget pushbuttons merely by flicking a switch. For pushbutton operation, any of five pre-selected channels or FM stations may be located quickly and accurately. No more dial twisting or trying to remember what station is in what direction. ± 1° accuracy and heavy duty rotor design. Complete instructions included.

GDP-258, 16 lbs. . . no money dn.,$5 mo. . . . **$49.95**

Connect Your Antenna The Modern, Reception-Proven Way With Coaxial Cable

Coaxial cable is used in thousands of commercial TV stations, motels, hotels and cable TV installations. Why? Because it is far superior in signal carrying capabilities to twin-lead. And it is an absolute necessity for really superb, distortion-free color television. Twinlead loses signal strength, causes phase shifting and wears out quickly. This special sweep tested, color coaxial cable has none of these faults, and it can be run through pipes, near electrical lines etc. without causing color-killing distortion. Coax will last 10 to 15 years under the most adverse conditions too.

3 lbs. **$7.95**
GD-238, 100' coax w/connectors installed,
4 lbs. **$9.95**

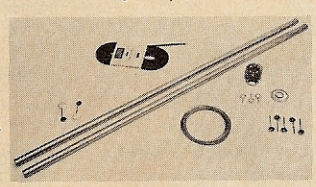


High Quality Alliance Tenna-Rotor . . . Save $16.50

Save money and put a top performing antenna rotator on your roof at the same time—this is a real value. Features the well-known patented 5-wire bridge-type circuit—a sure sign of quality. Rotates a full 360 degrees in either direction and is instantly reversible, thanks to its magnetic braking action. Lubricated for life and sealed against moisture. Uses standard 115V, 60 Hz house current.

GDP-214, 11 lbs. . . no money dn., $5 mo. **$23.45**

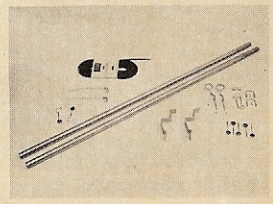
Strong, Safe Antenna Roof Mount Kit



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

GD-218, 8½ lbs. **$6.95**

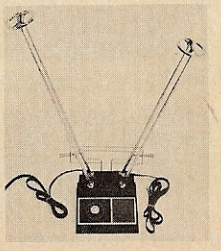
Chimney Mount Your Antenna Efficiently With This Complete Kit



Nothing extra to buy—you get everything you need to do a first rate job of chimney mounting your new antenna. Kit includes two 5' masts, "Z" chimney mount, 50 foot of 300 ohm transmission line, five 3½" and two clip-type standoffs, two steel straps and complete instructions.

GD-208, 9½ lbs. **$6.95**

Premium 82-Channel Jerrold-Designed Antenna



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

GD-198, 2½ lbs. . . . **$9.95**

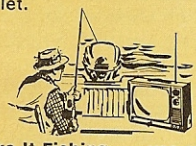
Heath Has The World's Largest Selection Of Electronic Kits—Over 300 To Choose From



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.



Deluxe Solid-State Portable B&W TV

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

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

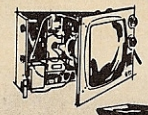
PORTABLE A-GO-GO! That's the versatile, easy-to-carry GR-104. With its optional battery pack it goes where you go . . . beach, picnic, camping, fishing . . . to bring you all your favorite TV shows. If you're a boat owner, run it off the boat's 12 v. battery for at-sea TV. Or plug it into any household 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 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**

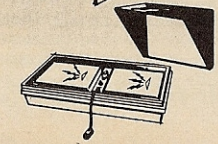
GR-104 SPECIFICATIONS: Picture Size: 74 sq. in. viewing area, picture diagonal 12". **Deflection:** Magnetic, 110 degrees, 20 mm neck. **Focus:** Electrostatic. **Antenna Input Impedance:** 300 ohm balanced. **Tuning Range:** VHF TV Channels 2 thru 13, UHF TV channels 14 thru 83. **Picture IF Carrier:** 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:** 11½" H, 15¾" W, 9⁵⁄₁₆" D. **Net weight:** 20 lbs.



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



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



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

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

America's Lowest Cost Solid-State Organ

FREE! Thomas 40 Lesson Self Teacher-Record Course When You Buy This Organ!

Sells For $19.95, a fifty dollar value, and now it's yours FREE when you buy either TO-67 or GD-325C organs. Provides firm basis of musical knowledge. Includes four 33⅓ RPM 12" records, comprehensive music book with many song favorites, gold-embossed white leatherette album. GDA-232-2, recorded lessons, 5 lbs., available separately $19.95

Add Musical Enjoyment To Your Home . . . With The Heathkit®/Thomas COLOR-GLO Organ

• Exclusive Thomas Color-Glo to start you playing instantly • All genuine Thomas factory-fabricated components • 10 true organ voices • Variable repeat percussion. . . produces banjo, mandolin, balalaika effects • 13-note heel and toe bass pedals range C_1 through C_2 • 2 overhanging 37-note keyboards, range C_2 through C_5 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. Thousands of people have already experienced the thrill and unique personal satisfaction that comes from building this sophisticated, beautiful sounding musical instrument. It takes no special skills or knowledge . . . the world-famous Heathkit manual guides you every step of the way, with clear, simple instructions and large, fold-out drawings. Genuine Thomas factory-made parts . . . diagrammed, easy-to-wire circuit boards . . . factory-built cabinet that's ready for the sub-assemblies as you complete them. You even tune the organ with the pre-tuned tone generator using a simple counting method . . . no "musical ear" needed. And you enjoy very substantial savings over assembled versions. For sheer musical enjoyment, great satisfaction and kit-building fun, you just can't beat the Heathkit/Thomas Solid-State Electronic Organ.

Kit GD-325C, organ and matching bench, 172 lbs. . .
$44 dn., as low as $26 mo. (REA or motor freight only) **$439.95**
Export model available for 115-230 v. AC, 50-60 Hz; write for prices

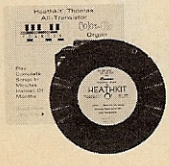


5-Year Warranty!
The transistorized plug-in tone generator boards, the heart of the organ, are warranted for five years. You buy with confidence when you buy a Heathkit version of the Thomas Organ. Replacement upon prepaid return of undamaged board to the Heath Company.

GD-325C
$439.95
(including bench and FREE 40 lesson Self-Teacher-Record Cours



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!



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.

Multiply The Musical Capability of Your Heathkit/Thomas Organ . . .

with the optional Band Box and Playmate kits. The Band Box adds ten different percussion instruments to the music you play and the Playmate supplies fifteen different rhythms. Almost like having a full orchestra at your fingertips! See page 17 for details.

Heath Has The World's Largest Selection Of Electronic Kits—Over 300 To Choose From

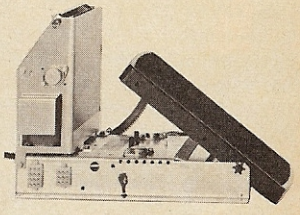
Deluxe Heathkit®/Thomas "Paramount" Transistor Theatre Organ



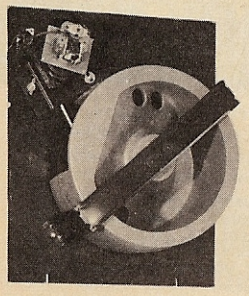
TO-67

$1,095.00

(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.



Profesional 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.

Use Heath's Free Technical Consultant Service—Write Them On Any Kit Subject

Boasts 19 Organ Voices, 200 Watts Peak Power, Chimes, Rotating Leslie Speaker, Horseshoe shaped Console, Plus a Host Of Other Professional Features At Up To $400 Savings

FREE! Thomas 40 Lesson Self Teacher Record Course When You Buy This Organ!

Sells For $19.95, a fifty dollar value, and now it's yours FREE when you buy either TO-67 or GD-325C organs. Provides firm basis of musical knowledge. Includes four 33⅓ RPM 12″ records, comprehensive music book with many song favorites, gold-embossed white leatherette album.

GDA-232-2, recorded lessons, 5 lbs., available separately....$19.95

ALL GENUINE THOMAS FACTORY-FABRICATED COMPONENTS . . . DO-IT-YOURSELF HEATHKIT SAVINGS. Here is a truly sophisticated organ with a wide array of deluxe features to give professional playing versatility. Add to this its advanced transistor circuit, luxurious horseshoe console, rainbow of multi-colored voice tabs, and you have an outstanding instrument you'll be proud to have in your home. And Heathkit do-it-yourself assembly makes it possible for you to own this superb organ at cost far below its factory-built version.

15 MANUAL VOICES, 4 PEDAL VOICES . . . all at the flip of a tab. **SOLO:** Diapason 16′, Bass Clarinet 16′, Trumpet 16′, English Horn 8′, Oboe 8′, Violin 8′, Tibia 16′, Tibia 8′, Tibia 5⅓′, 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′—F_1 to C_5. Solo manual range 16′, 8′, 4′, 5⅓′—F_1 to F_6.

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′—C_0 to C_2.

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 subassemblies as you complete them.

FAMOUS HEATH ENGI-NUITY MAKES ASSEMBLY EASY . . . simple step-by-step instructions and large diagrams and pictures guide you every step of the way . . . no special skills or knowledge needed. You even tune the organ yourself with a pretuned tone generator . . . no musical ear needed. Assembly time 80 to 100 hours, and you enjoy savings of over $400 over the factory assembled version.

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

Kit TO-67, organ & matching bench, 265 lbs...Express or motor frt. $200 dn., as low as $29 mo.....**$1095.00**

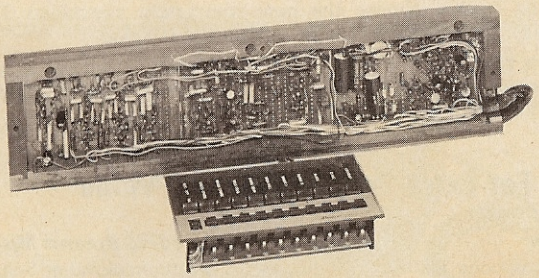
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

5-Year Warranty

The transistorized plug-in tone generator boards, the heart of the organ, are warranted for five years. Replacement upon prepaid return of undamaged board to the Heath Company. You buy with confidence when you buy a Heathkit version of the Thomas Organ.

Add New Musical Enjoyment To Your Heath Organ With The Thomas Band Box And Thomas Playmate Kits

Add The Full Orchestra Sound Of Band Box Percussion



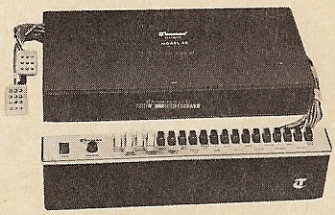
With this easy-to-build, easy-to-play Thomas Band Box, you can add ten exciting instrumental voices . . . bass drums, brush & crash cymbals, clave, block, two different bongos, castanets, snare drum and drum roll . . . to the selections you play. Instantly, a simple melody sounds like a full orchestra. Play a Tango selection with an authentic gypsy castanet accompaniment, a tune from the Old West with the clop-clop of horse hoofs, or a heart-stirring march with the roll of the snare drums and crash of cymbals. One or all may be preselected to sound as you play the lower manual, pedals or both . . . or voices may be actuated manually at the touch of a button. Adjustable volume control to suit the music you play. Assembles and installs in 10-12 hours. **Important:** Instruction manual covers assembly of Band Box and installation into TO-67 organ only.

Kit TOA-67-1, 9 lbs...no money dn., $15 mo.....**$155.00**

Attention Heathkit/Thomas Organ Owners! The Thomas Band Box may be added to all previous and present Heathkit/Thomas organ kits. Special drawer and slides are required for support (except with TO-67). Assembly manual covers installation into all model GD-232, GD-325 and GD-983 organs.

TOA-67-2, 3 lbs.... Band Box drawer and slides, no money down, $5 mo.....**$35.00**

New! Playmate Kit Creates Rhythms For Organ And Band Box



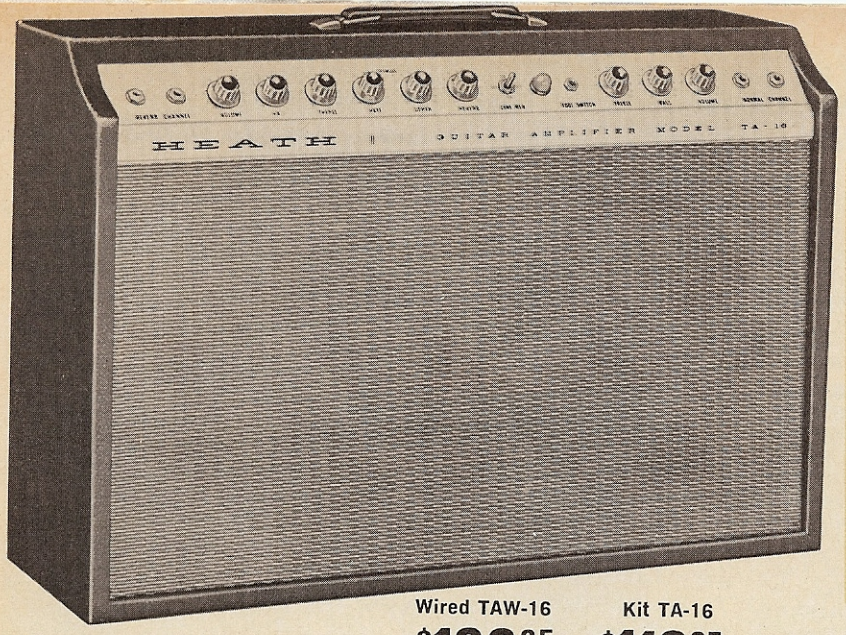
Adds any of these 15 different rhythms to the music you play . . . Waltz, Viennese Waltz, Jazz Waltz, Fox Trot 2/4, Boogie 6/8, Swing, Rock, Watusi, Samba, Beguine, Cha Cha, Rhumba, Tango, Bolero, Bossa Nova. With just a push of a button you apply rhythm to the organ lower manual and foot pedals only, 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.

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

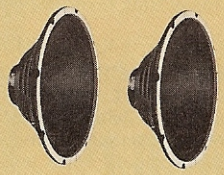
"Starmaker" Amplifier





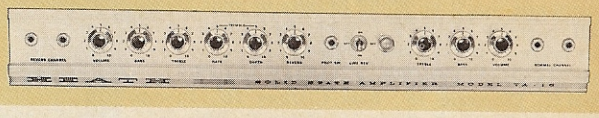
One Easy-To-Build Circuit Board . . . 13 transistors, and 6 diodes for cool, instant operation; high stability.





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.



Wired TAW-16 **$199.95** $19 mo

Kit TA-16 **$119.95** $11 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 ¾" stock . . . measures 28" W x 9" D x 19¾" H • Black and white patterned grille cloth • Extruded aluminum front panel with black nomenclature and chrome-plated knobs with black inserts

ALL THE FEATURES GUITARISTS WANT MOST IN AN AMPLIFIER, at less than half the usual cost. Delivers the coolest 25 watts of EIA music power or 60 watts of peak power you've ever heard . . . with a pure, robust sound that brings out the natural tone of your instrument. And since it's all solid-state, there are no tubes to deteriorate or wear out–you get peak performance at all times.

BUT DON'T TAKE OUR WORD FOR IT. Read what TA-16 owners say about this superb amplifier. **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."*

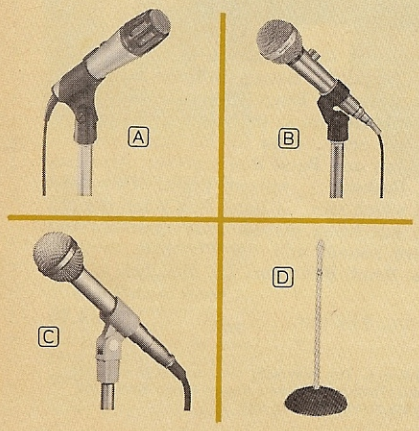
TWO CHANNELS FOR COMPLETE VERSATILITY. A normal channel for accompaniment, accordion, singer's microphone (not recommended for bass guitars) . . . the other channel has both variable reverb and tremolo for lead and solo guitars. The specially designed LDR tremolo circuit is variable in both speed and depth so you can create a variety of musical effects. Each channel has two inputs, plus separate volume, bass and treble controls. And a line bypass reversing switch reduces hum.

PREASSEMBLED CABINET . . . CHROME-PLATED KNOBS. The leather-textured black vinyl-covered cabinet is made of ¾" stock with a black & white patterned grille cloth . . . measures 28" W x 9" D x 19¾" H. And the extruded aluminum front panel has chrome-plated knobs.

CHOICE OF KIT OR FACTORY-BUILT MODELS. With the TA-16 kit you enjoy maximum savings. Takes only 8 to 10 hours to build . . . just one circuit board to wire, plus a few parts to mount on the chassis, and two speakers, controls and reverb unit to install. 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., $11 mo. **$119.95**
Assembled TAW-16, 52 lbs. (REA or Motor Freight), no money dn., $19 mo. **$199.95**

Choose These Famous Name Accessories For Extra Performance And Value



A ***Shure Model 515SAC Undirectional***

The greatest value going in the microphone marketplace. Particularly suited for small combos and singers and ideal for use in clubs, theatres, auditoriums. Features high impedance input, wide 80 to 13,000 Hz response, on-off switch with lock. Comes with 15' non-detachable cable, swivel adapter and phono plug adapter. Satin chrome finish.

GDP-278, 5 lbs. . . .no money dn., $5 mo. . . . **$24.70**

B ***Shure Model 585SAVC Undirectional Unisphere***

Ideal for use either indoors or out, or anyplace where omnidirectional mikes won't operate properly due to poor acoustics or wind. Features a unique volume control right on the body of the microphone–no need to walk back to the amplifier. Includes a built-in wire mesh screen to eliminate wind & "pop". High impedance. 15' detachable cable, swivel adapter & phono plug adapter included.

GDP-288, 5 lbs. . . .no money dn., $5 mo. . . . **$43.81**

C ***AKG Model D-707TS Dynamic Microphone***

A remarkable microphone value. Suitable for virtually any application. An amazing frequency response of 50-15 kHz ±3.5 dB. Strong anti-feedback characteristics; capable of handling high sound pressure levels without overloading or distortion. Features 15' cable assembly with on-off switch built into mike connector, and 200 ohm to Hi Z transformer built into phono plug. Complete with stand adapter & case.

GDP-268, 5 lbs. . . .no money dn., $5 mo. . . . **$49.50**

D ***Atlas Model MS-10C Floor Stand***

Full features at a low price. 2-section chrome tube adjusts from 35" to 63" . . . interlined with bakelite to prevent jamming or sudden dropping. Long clutch can be gripped by entire hand, not just fingers. 10" gray base. Self-leveling shock-absorbing pads. ⅝"-27 thread.

GDP-106, 11 lbs. **$6.90**

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

The Solid Sound Of Solid-State



Low Cost Single-Channel Guitar Amplifier . . .

Features 20 Watts of EIA Power, 40 Watts Peak . . .

Variable Reverb & Tremolo . . . Available Kit Or Assembled

• 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

Wired TAW-27 **$129.95** $12 mo.

Kit TA-27 **$89.95** $9 mo.

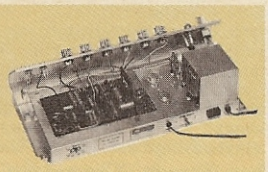
Ideal For Beginning Guitarists, Yet Has Professional Features that give you top performance as your playing becomes more proficient. Start with its solid-state circuit. Runs cool and collected for a lifetime of trouble-free performance—no tubes to deteriorate. Comes on instantly—no waiting for warm-up. 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.



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

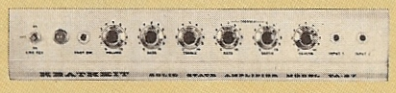


12″ Special Design Speaker with heavy-duty 10 oz. ceramic magnet projects maximum power output.



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.



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 ½″ 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 19¾″ 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**

New Heathkit TA-28 "Fuzz" Booster . . . Adds Unique Sound At Low Cost

Kit TA-28 **$17.95**

THROUGH HEATH NEW RESEARCH

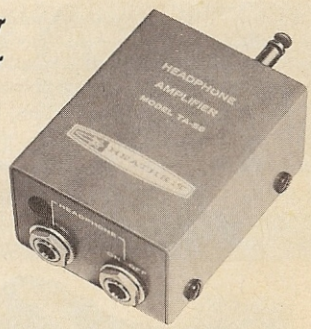


The "Mod" Sound For Any Guitar Amplifier. Just plug this new unit between your guitar and your amplifier and you've got that "fuzz" sound. Built into a footswitch housing, this new "Fuzz" Booster is an all-transistor circuit powered by its own internal battery. Push the switch to add the "fuzz," push it again to play it straight. Two controls permit you to add the degree of "fuzz" you wish and to alter the character or tone as you like it. The circuit uses a 1.5 v. AA battery (not included) and since so little current is required, the battery lasts a long time . . . the circuit is turned on and off automatically as the guitar cord is connected or disconnected. The die-cast metal housing will withstand years of use and has a hinged base plate for battery replacement. Build it in one evening and increase the versatility of your music system.

Kit TA-28, 4 lbs. **$17.95**

New Heathkit Guitar Headphone Amplifier For Private Practice and Instruction

Kit TA-58 **$9.95**



Practice your guitar playing in private . . . only you can hear when you use this handy little unit. Or use two pairs of headphones so just you and your teacher can hear your playing. The all-transistor circuit is powered by a miniature 9 v. battery (not included) which will last up to 60 hours. This compact amplifier plugs directly into your guitar and will drive one or two pairs of stereo or monophonic headphones. Tone and volume may be varied by your guitar controls. The amplifier automatically turns on as you plug it into your guitar. Build it in one evening.

Kit TA-58, 2 lbs. **$9.95**

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

Deluxe Solid-State Combo Amplifier & Matching 2-Way Speaker Systems...

Kit Or Assembled





Kit TA-17 $175.00 $17 mo.

Wired TAW-17 $275.00 $26 mo.

Solid-State Combo Amplifier Delivers 120 Watts EIA Music Power . . . Built-In "Fuzz", Brightness, Tremolo—All The "Big Sound" Features Every Combo Wants

• 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

More Than Enough "Charged-Up" Sound For Any Scene any combo group makes. More than enough to disconnect a discotheque, gyrate a gym...even fill a parking lot. Delivers a whopping 120 watts through two Heathkit TA-17-1 two-way speaker systems. Or 90 watts through one TA-17-1. Runs at maximum power without danger of input overload thanks to special volume control circuits in the guitar and bass channels. And it's versatile. You can play solo guitar through it. Or a bass guitar, combo organ, accordion, singer's mike...even a record changer or turntable.

"Piggyback" Design...Choice Of Kit Or Wired. Stacks neatly with the matching TA-17-1 speaker system...has two carrying handles for easy portability. Cabinet is made of black vinyl-covered compressed wood... measures 25⅞" W. x 14½" D. x 6¾" H. If you choose the kit version, 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, 33 watts idling, 230 watts at full output. 12' power line cord.

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. Go "pro"...go with the new TA-17!

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**

Matching 2-Way Speaker System . . . Buy A Pair With Combo Amplifier For 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 fiberglass voice coil, treated cloth suspension system and epoxy cements...will safely handle 90 watts of EIA rated music power. System impedance is 8 ohms. The specially engineered sealed cabinet is solidly constructed of a black vinyl-covered ¾" 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 25⅞" W x 14½" D x 38" H, not including casters & handles. Includes 20' cable.

Choice Of Kit Or Factory Assembled. If you buy the kit version, assembly takes only an hour or two—cabinet is preassembled, just mount the speakers —and you enjoy additional savings. For best performance and greatest savings, mate a pair with the new Heathkit TA-17 Combo Amplifier.

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.



High Power Atlas "Banshee" Speaker-Horn Makes Vocals Heard Above Instrument Sounds

If your singing can't be heard, put these new "Banshee" horns to work in your group. Designed especially for voice, these new units boost the sound of your singers above that of your instruments. Each "Banshee" will handle up to 125 watts of peak music power and the 16 ohm impedance allows use of one unit or two with any PA or instrument amplifier. Mounted on stands in front of your group, these horns will operate at much higher levels of sound with less feedback than ordinary speakers. Handsomely styled in durable, mar-proof molded fiberglass in rich charcoal and red, the "Banshee" is easily portable and suitable for indoor or outdoor use. Connections are easy with standard guitar type phone plugs and cables. The heavy duty tripod will support up to seven hundred pounds, extends from 5 to 10 feet with double lock for safety, and includes an "easy-off" adapter for mounting the horn. (Not a kit.)

Model TDP-18, speaker-horn, 21 lbs., no money dn., $8 mo.....**$71.15**

Model TDP-28, tripod, 29 lbs., no money dn., $5 mo.....**$28.22**

Heath Has The World's Largest Selection Of Electronic Kits—Over 300 To Choose From

VOX Jaguar



TO-68

$299.00

$28 mo.

Combo Organ By Heathkit®

New Lower Price Saves You $50

• All solid-state circuit . . . for cool, instant operation, long trouble-free life • All genuine VOX parts • Separate bass output gives brilliant "stereo" bass effect • Four octave keyboard with 49 keys, range C_2 to C_6 • 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 C_1 • Contour control changes 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

Heathkit Scene-Shaking Equipment Gets Your Sound Out In Front!



The Vox Jaguar with waterproof carrying cases, the TA-17 120-Watt combo amplifier and the TA-17-1 2-way speaker system—they'll keep you in front of the crowd.

The World-Famous VOX Jaguar Combo Organ . . .
The Most Mind-Bending, Soul-Grabbing Sound Around . . .
Brightness, Vibrato, "Stereo" Bass, Solid-State Circuitry . . .
At $200 Less Than Assembled Models

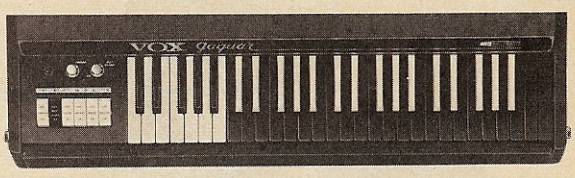
The Favorite Of Top Groups The World Over . . . the popular VOX "Jaguar" solid-state combo organ. Famous for its unique sound . . . the most distinctive sound of all the combo organs. You've heard it on many records and TV shows, in many movies. The secret? Each note is made up of a mixture of tones . . . 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 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.

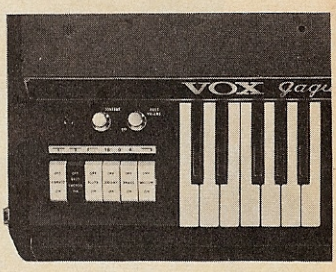
More Voicing Features. There are Flute, Bright, Brass and Mellow tabs to create a wide variety of musical effects. With Flute you get a pure, wholesome sound. With the Bright tab, you produce both ends of the sound spectrum with amazing brilliance and clarity. With the Brass tab, the sound becomes brash 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 . 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 . . . 34⅛" 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: 120 V. AC and 240 v. AC, 50-60 Hz, 14 watts. Order this famous combo organ now!

Kit TO-68, 91 lbs. . . no money dn., $28 mo. **$299.00**

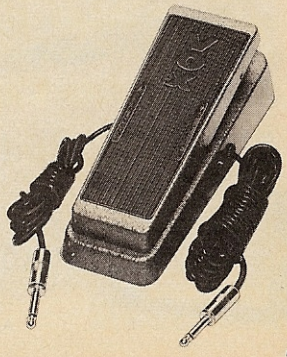


Fingertip Command Of All The Action with factory assembled keyboard with 49 keys, range C_2 to C_6 in 4 octaves. "Walking" bass provides another octave lower to C_1. All solid-state circuit for cool, instant operation, long trouble-free life.



"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.

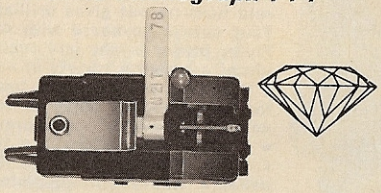
Foot-Operated Expression Pedal included . . . permits you to vary both bass and treble keyboard volume when played through the normal signal output.

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

Portable Phonographs For Teens On The Go!

Suitcase Portability Lets You Enjoy The Solid-Sound Of Stereo Anywhere . . . On This 4-Speed Transistor Portable Phonograph . . . Build In 3-4 Hours

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



GD-107
$51.95



• Automatic or manual stereo and mono play of any size 16, 33⅓, 45 & 78 rpm records • All solid-state circuit for cool, instant operation and long, trouble-free life • Ceramic cartridge with dual Diamond/Sapphire styli for LP's or 78's • Fold-up changer and easy-grip handle for portability • Volume, Stereo Balance and Tone controls • Twin 4"x6" speakers and "in-depth" cabinet design for crisp highs and deep bass others can't match • Safe, "shockproof" operation • Plays on any 120 v. 60 hertz source • 45 rpm 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

RUNS COOL AND COLLECTED with an 8-transistor amplifier that delivers up to 1½ watts per channel through 4" x 6" speaker. There are 3 separate, front-panel controls . . . volume control, a tone control to accent the "highs" or "lows," and a balance control for equal sound levels. The automatic changer plays all sizes, all speeds—stereo or mono, then shuts itself off automatically. And the ceramic cartridge features dual styli . . . diamond for LP's, sapphire for 78's.

LOOKS COOL & COLLECTED . . . EASY TO ASSEMBLE IN ONE EVENING. 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. Makes an ideal second system for rec room, patio . . . any room in the house. 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.

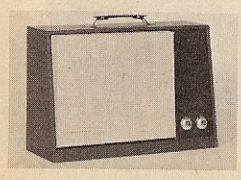
Kit GD-107, 29 lbs. . . (Express or motor freight)
no money dn., $5 mo. **$51.95**

GD-107 SPECIFICATIONS—CHANGER: Type, Maestro Model 52-93. Speeds, 16, 33⅓, 45, and 78 RPM. Record Sizes: 7", 10", and 12". Cartridge; Stereo ceramic. Stylus; 0.7 mil diamond for LP's, 3 mil sapphire for 78's. **AMPLIFIER:** Power output, 3 watts, 1½ watts per channel EIA music power. Frequency response; ±5 dB 100 Hz to 10 kHz. Equalization; RIAA. Transistors and Diodes; 4 2N3393, 2 2N2430, 2 2N2431, 1 silicon diode. Speakers; 2 4" x 6", 25 ohm voice coils. Controls; volume, tone, and balance. **GENERAL:** Dimensions; 15" H x 8½" D x 25¾" W. Power requirements; 120 V, 60 Hz AC, 15 watts.

4-Speed Mono Phonograph Plays Anything From Bach To "Rock"—Beatles To Beethoven . . . Perfect Beginner's Kit For Young Teens



GD-16
$34.95



Suitcase Portability . . . compact size, light weight, easy-grip handle and fold-up changer for easy carrying from room to room, or house to house. Use on any 120 v. AC household source.

• Automatic monophonic play of 16, 33⅓, 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"x6" speaker, 45 rpm adapter 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. **$34.95**

GD-16 SPECIFICATIONS—CHANGER: Type, Maestro Model 52-79. Speeds, 16, 33⅓, 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 7¾" D x 20½" W. Power requirements; 120 v. 60 Hz AC, 15 watts.

Heathkit Jr.® Series . . . Fun Kits For Youngsters

Solid-State 4-Speed Mono Portable Phonograph

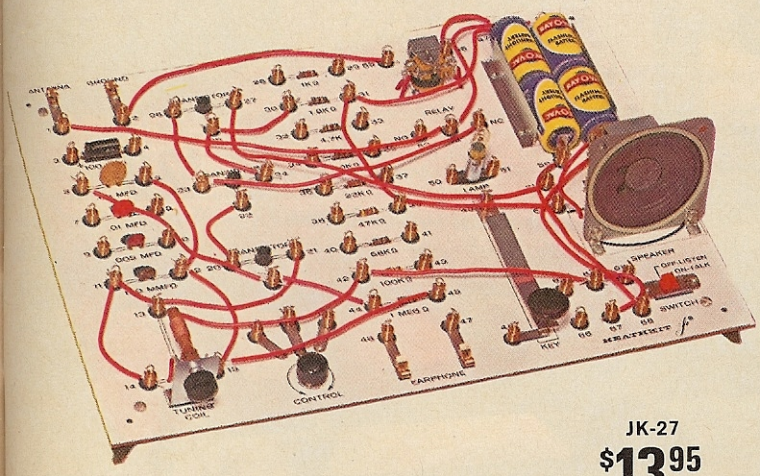
• Plays 16, 33⅓, 45 and 78 rpm mono records • Handles 7, 10 and 12" record sizes • Built-in 45 rpm adapter disc • Crystal cartridge with universal sapphire stylus for all types of records • Solid-state circuit for cool, instant operation, long life • Suitcase style cabinet of durable wood and hardboard, covered with ivory & desert gold polyethylene • Detachable lid • Preassembled turntable mechanism . . . just one tiny circuit board to build • 4" speaker • Steel top chassis plate



SO EASY TO BUILD ANY YOUNGSTER CAN DO IT. They'll have fun building it, fun using it . . . listening to their favorite story albums and music. Will keep them busy during those "don't-know-what-to-do" times. Handsome suitcase style cabinet with detachable lid . . . lets them tote and use it anywhere.

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:** 4 transistors, 1-Silicon Diode. **TURNTABLE: Type:** 4 Speed Phonomotor. **Turntable Diameter:** 8⅛". **Cartridge Type:** Crystal. **Stylus:** Universal sapphire 0.7 to 3 mil for all records. **GENERAL: Power Requirements:** 117 VAC 60 Hz 14 watts. **Size:** 12⅞" W x 11¼" D x 5⅜" H.



JK-27
$13.95

Electronic Workshop "19" . . . Hours Of Fun Experimenting With Circuits That Are Safe, Educational & Really Work

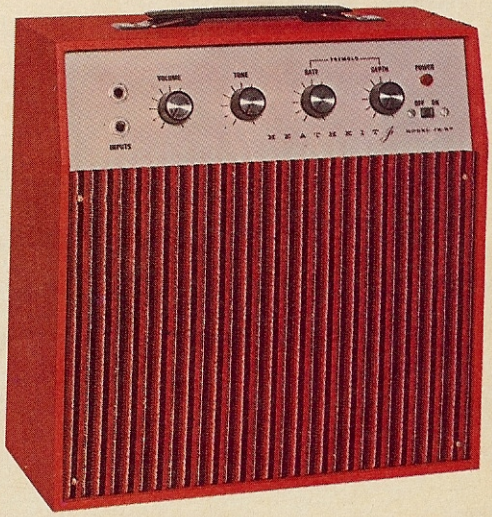
• Contains all materials & instructions for building 19 different electronic items • Fast, solderless spring-type connectors • Operates on safe, economical flashlight batteries (not included)

PERFECT FOR ANY YOUNGSTER WHO WANTS TO EXPLORE THE MYSTERIES OF ELECTRONICS. 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 four 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**

Solid-State Single-Channel Guitar Amplifier . . . Variable Tremolo & 9 Watt Music Power . . . For Only $29.95

• 7 transistor, 3 diode circuit for cool, instant operation . . . peak performance at all times . . . long, trouble-free life • 9 watts EIA music power, 18 watts peak power • Tremolo variable in rate and depth for a variety of effects • Two inputs for solo guitars • Volume and tone controls • All front-panel mounted controls and inputs • Carrying handle for easy portability • Red cabinet with red, silver & black striped grille cloth measures a compact 13½" W x 5⅞" D x 14" H



JK-37
$29.95
$5 mo.

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. 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 13½" W. x 5⅞" 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. An ideal beginner's kit for any youngster. Runs on 120/240 v. AC, 50-60 Hz.

Kit JK-37, 14 lbs. . . no money dn., $5 mo. **$29.95**

Use Heath's Free Technical Consultant Service—Write Them On Any Kit Subject



Ⓐ GR-17
$43.95

Ⓓ GR-151A
$20.65

Ⓑ GR-24
$28.25

Ⓒ GR-43A
$139.95

Quality Portables For AM, FM, & Shortwave

Ⓐ *New Heathkit AM-FM Solid-State Portable . . . Performance That Others Can't Match*

• 12 transistor, 7 diode circuit for peak performance • Pre-aligned AM-FM front end like those used in Heath high fidelity tuners • 3 IF stages on FM for amazing 5 uV sensitivity • Big 4" x 6" oval speaker for lifelike sound • Easier tuning slide-rule dial • Tone Control • Built-in AM rod antenna • Telescoping whip antenna for FM • Automatic Frequency Control on FM • Amplified AGC on AM • Built-in external earphone jack and earphone • Rich brown simulated leather case • Circuit board construction for fast, easy assembly • Optional converter/charger

EVERYTHING YOU COULD ASK FOR IN A PORTABLE . . . lightweight, rugged, reliable performance . . . that's what you get from the GR-17. AM or FM at the flick of a switch, anywhere, anytime . . . and what reception! The big ½" diameter ferrite rod antenna pulls in AM stations that other portables can't get and the three tuned AM transformers and amplified AGC provide clear, stable listening. The FM section features a collapsible 34" whip antenna, three IF stages and 5 uV sensitivity for sharp, accurate FM reception over distances not possible even with other full-size portables. And the AFC keeps that station locked in for pleasurable drift-free listening.

HEATH ENGINEERS CARE ABOUT SOUND. The audio output to the big 4" x 6" speaker is 350 milliwatts—enough to fill your campsite or your room at home. And a common problem of other portables has been eliminated too, as the batteries go, so does your sound. Not with this one—a Zener diode biased IF strip keeps the gain constant down to minimum usable voltage. Won't eat its own weight in batteries every week either . . . runs 200-300 hours on a single set of six "D" cells in normal use. A lot longer with the optional charger/converter.

EASY TO OWN, EASY TO BUILD. The GR-17's low price and high quality components make it an outstanding value, and the all solid-state, circuit board construction combined with the famous Heathkit manual makes this portable easy and fun to build. Order one now, for the greatest sound around.

Kit GR-17, 5 lbs., no money dn., $5 mo. **$43.95**
Model GRA-43-1, Converter/Charger for 117 v. 60 Hz AC, 1 lb. **$6.95**

GR-17 SPECIFICATIONS—AM SECTION: Tuning Range: 535 kHz-1620 kHz. **Intermediate frequency (IF):** 455 kHz. **Sensitivity:** 200 microvolts per meter for 20 dB signal-to-noise ratio. **FM SECTION: Tuning range:** 88-108 MHz. **Intermediate frequency (IF):** 10.7 MHz. **Sensitivity:** Less than 5 microvolts per meter for 30 dB quieting. **GENERAL: Speaker:** 4" x 6" oval, permanent magnet, 16 ohm voice coil. **Audio output:** 350 mW. **Batteries:** Six 1½ volt "D" cells. **Approximate battery life:** 200 to 300 hours at normal listening levels. **Current drain:** Idling current; AM—approximately 15 mA. FM—approximately 18 mA. Normal listening level; AM—approximately 22 mA. FM—approximately 25 mA. Full volume; AM and FM—approximately 70 mA. **Dimensions:** 8¾" W x 6¾" H x 4" D. **Net weight:** 4¾ lbs. (with batteries).

Ⓑ *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 ½" 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 ½" 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:** 3¾" D x 8¾" W x 7" H (overall).

Ⓒ *Heathkit Deluxe 10-Band AM/FM/Shortwave Transistor Portable . . . Handsome, Versatile, Powerful*

• 10 bands tune Longwave, Standard Broadcast, FM and 2 MHz–22.5 MHz Shortwave Bands—listen to ships at sea, "ham" radio operators, marine & aircraft reports and hundreds of exciting foreign stations • 16 transistors, 6 diodes and 44 factory assembled, pretuned circuits for easy, enjoyable construction • Takes only about 10 hours to build • Two separate AM & FM tuners and IF strips • Two built-in antennas—a large ferrite rod conveniently housed in the handle for AM & Longwave, and a 5' telescoping whip for FM & Shortwave • Battery saver switch cuts current drain up to 35% • Lighted, rotating tuning dial • Logging scale helps relocate unknown frequencies • Four simple controls for tuning, volume, tone, AFC and band switching • Audio output circuit delivers husky 500 milliwatts into the 4" x 6" oval speaker for solid, room filling sound • Earphone & built-in jack for private listening • Deluxe styled in jet black extruded aluminum front & back panels, walnut-finished vinyl covered end pieces and chrome plated trim • Both panels hinged for easy access—magnetic latches • Inexpensive battery power • Optional converter/charger available—float charges batteries while running on 117 VAC house current • Time zone map & "Listener's Guide" included

Kit GR-43A, 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-43A SPECIFICATIONS—AM SECTION: Tuning range: Longwave—150-400 kHz. Broadcast—550-1600 kHz. Shortwave—2-4 MHz; 4-9 MHz; 31 M—9.2-10.2 MHz; 25 M—11.2-12.4 MHz; 19M —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: 150 mw. **Speaker:** 4" x 6" oval; permanent magnet; 3.2 ohm voice coil. **Batteries:** 6 size D cells, 1 size C cell. **Dimensions:** 13½" W x 5⅛" D x 10⅝" H including handle.

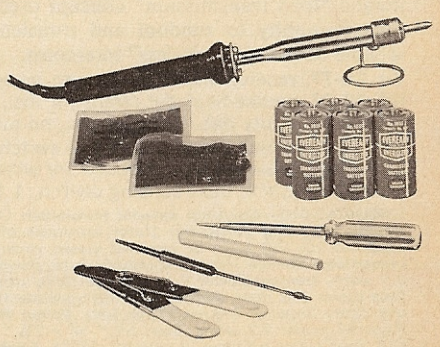
Ⓓ *Discover The Fun Of Kit-Building With The GR-151A Solid-State AM Portable . . . Includes FREE Tool Kit And Batteries*

• 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 it 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 resist keeping it for yourself.

Kit GR-151A, Radio, Tool Kit & Batteries, 5 lbs. **$20.65**



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

New Heathkit® Home Protection System

This Unique New Heathkit Home Protection System Uses Household AC Power Lines As The Connecting Medium Between Units . . . Applications Are Almost Limitless . . . And You Can "Customize" To Your Needs

• New signaling method developed by Berkeley Scientific Laboratories, exclusively licensed to Heath • No difficult installation; uses AC power line as connecting medium between units • Operates over long distances if all units are on same side of AC line transformer • Since alarm signals will appear on all AC lines from the same side of the outdoor pole transformer, you can set up a "community" alarm system . . . if your neighbors' homes have a Heath system, you can warn each other of emergencies . . . if they do not use a Heath system, you can give one your Receiver to monitor so he can "keep watch" over your property during your absence • No false alarms . . . units generate unique signal not developed by other electrical devices or noise • Dependable solid-state circuitry • System is extendable . . . use as many units as you need • Extra heat sensors may be added to smoke-heat detector • Utility unit accepts sensors to guard against intrusion, fire, cooling, freezing, thawing, rising or receding water levels, pressure changes, etc. (normally open or closed switches) • Fail-Safe . . . alarm sounds if power fails or components in system cease operation • So versatile your imagination is practically the only application limit • Easy to build circuit board construction

OF PARAMOUNT CONCERN TO EVERYONE is the protection of his family and home . . . particularly today in these times of increased hazards. The Heathkit Home Protection System is designed to give you that priceless peace of mind which comes with knowing you have provided for your family's safety in times of emergency. Early warning provides time to take proper action . . . the Heathkit system gives you that margin of safety reliably, economically.

YOUR HOME IS ALREADY WIRED FOR THIS SYSTEM. No more tedious stringing of unsightly wires, just plug these units into the nearest AC outlet; they are powered by the AC line and use it as an interconnecting medium. The receiver-alarm needs no other wires; the smoke-heat detector needs no other wires unless you add extra heat sensors in addition to its built-in sensor; the utility unit can be located by the AC outlet nearest its associated switches or sensors to keep such wiring to a minimum.

VERSATILITY ALMOST LIMITLESS. Wide-range capability is built-in. Normally the receiver-alarm is kept at bedside, but you can add extra receivers anywhere you choose, or plug an accessory 117 VAC bell or buzzer into the receiver to extend the range of the alarm. Normally the smoke-heat detector is located in a hallway outside the bedroom area near the ceiling where smoke and heat would accumulate. Other locations are in the furnace room or over the kitchen range; extra heat sensors may be added for attic, chimney, fireplace, etc. The utility unit accepts any type of switch or sensor for any purpose; examples are: magnetic reed switches for windows and doors to warn of entry; step-on or drive-on pressure switches for doors and driveway; micro switches with trip wire around yard to warn of intrusion; heat sensors warn of fire; water pressure switches warn of pump failure; thermal switches warn of freezing on farms, gardens, garages, etc. or thawing in your food freezer; thermostats warn of cooling in critical temperature areas; two insulated wires act as a switch to warn of rising or receding water levels in sump-pump wells, pools, even boat bilges. Applications of the utility unit are almost unlimited . . . and Heath offers the accessory switches needed.

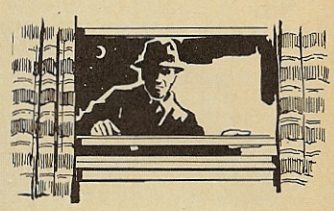
SMART APPEARANCE, FAIL-SAFE PERFORMANCE. Unobtrusive, small metal cabinets with beige and brown nonreflecting velvet finish. Fail-safe circuitry even signals when AC power fails. Receiver-alarm has built-in nickel-cadmium rechargeable battery (automatically kept charged) which sounds alarm if power fails, if unit is accidentally disconnected, if its power supply fails, or if other units in system fail. Smoke-heat detector actuates receiver-alarm if its power supply components fail or if its light source lamp fails (lamp is special 50,000 hour design). Utility unit actuates receiver-alarm if its power supply components fail.

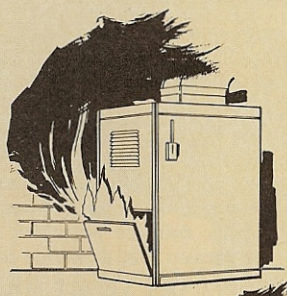
EASY TO BUILD AND INSTALL. All units are solid-state, circuit board design; the receiver takes 3 or 4 hours to build, the smoke-heat detector takes 4 or 5 hours, the universal units 3 or 4 hours (transmitter circuity is an encapsulated module). Installation, except for remote switches you choose, is just a matter of plugging into nearest AC outlets. Cost to operate is similar to that for electric clocks.

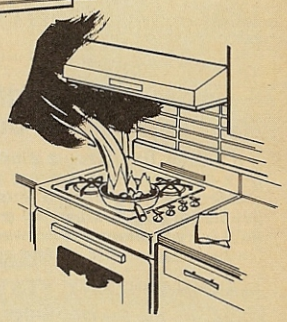
NEW SIGNALING METHOD INVENTED BY DR. W. M. WATTENBURG, OF BERKELEY SCIENTIFIC LABORATORIES, INC., a research firm devoted to development of data processing computer utilization techniques. This new signaling method is unique; the usual "load" signal generated by these units is almost impossible to duplicate in normal devices or random noise sources, hence false alarms are extremely rare. Because of the unique "load transmission" concept used, through the AC power lines, the receiver has very high immunity to random and transient signals. This technique is not the usual "carrier" scheme as used in "wireless" intercoms.

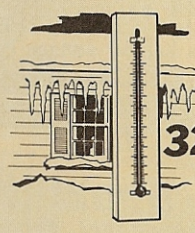
Kit GD-77, receiver-alarm, 4 lbs., no money dn., $5 mo. **$39.95**
Kit GD-87, smoke-heat det./trans., 4 lbs., no money dn., $5 mo. **$49.95**
Kit GD-97, utility det./trans., 2 lbs., no money dn., $5 mo. **$34.95**
GDA-97-1, miniature magnetic-reed switch for windows and doors, 1 lb. **$1.80**
GDA-97-2, miniature micro switch for windows and doors, 1 lb. **$2.00**
GDA-97-3, 133°F. heat sensing switch, 1 lb. **$2.25**

SPECIFICATIONS—Universal detector transmitter: Operating freq. 50 kHz. **Remote inputs:** Normally open & normally closed. **Triggering sensitivity:** (Total resistance of wire and sensors) Open circuit of 5,000 ohms or more closed circuit of 100,000 ohms or less and closed circuit of 100 ohms or less. **Controls:** Reset Test, freq. adjust. **Panel connections:** Remote inputs for sensors, aux. power. **Power requirements:** 105-125 VAC, 50-60 Hz., standby power 0.7 watts, transmit power 7 watts. **Size:** 3 1/16" x 2 5/8" x 5 3/8". **Receiver-Alarm:** Operating freq. 50 kHz. **Controls:** Tone alarm and reset. **Alarm:** 2800 Hz transistor transducer. **Rear panel connections:** Remote alarm socket (use with any alarm drawing 5 amps AC or less). **Power requirements:** 105-125 VAC, 50-60 Hz., standby power 1.5 watts, triggered power 2.2 watts. **Size:** 6 5/8" W x 2 5/8" H x 5" D. **Smoke-Heat Detector Transmitter:** Operating freq. 50 kHz. Heat sensor activates at apprxly. 133°F. **Smoke detector lamp:** #755 (50,000 hour life). **Rear panel connections:** Auxiliary input terminal strip for connection of external heat sensors. **Power requirements:** 105-125 VAC, 50-60 Hz., standby power 3.2 watts, transmit power 10 watts. **Size:** 5 1/2" W x 2 5/8" D x 8 7/16" H.

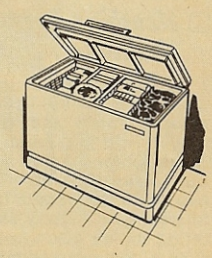

Intrusion Alarm

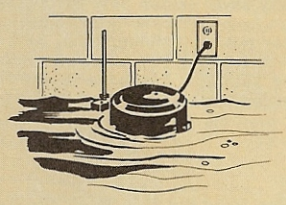

Smoke & Fire Alarm

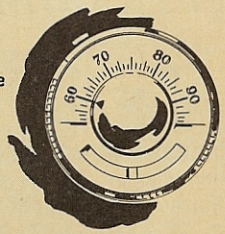

High Temperature Alarm



Freezing Alarm


Thawing Alarm


Rising Water Alarm



Changing Temperature Alarm

Power Failure Alarm

Guards Your Family And Property

HEATHKIT®





GD-77
$39.95
$5 mo.

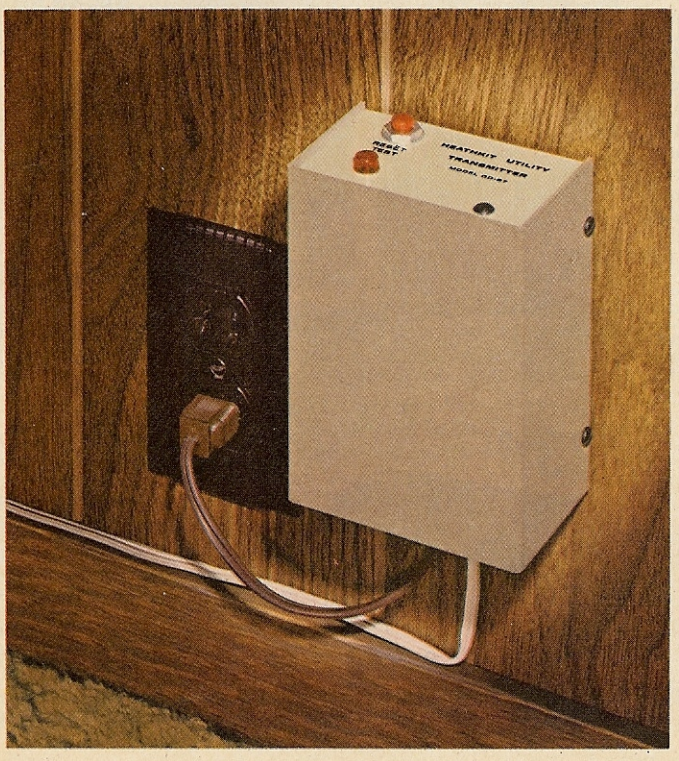
Receiver-Alarm . . . always alert to signal any emergency . . . sounds high-pitched electronic tone . . . plugs into AC outlet, no other wires needed.

3 Easy-To-Build Solid-State Units
That Just Plug Into AC Outlets . . .
Reliable, Fail-Safe, Versatile . . .
Always On Guard
For Worry-Free Security



GD-87
$49.95
$5 mo.

Smoke-Heat Detector/Transmitter actuates Receiver-Alarm if smoke or 133°F. heat is present . . . plugs into any AC outlet where hazards exist, no other wires needed.



GD-97
$34.95
$5 mo.

Utility Transmitter accepts any type switch or sensor to detect any hazard you wish to guard against; intrusion, heat, cold, freezing, thawing, water, etc. . . . plugs into AC outlet, actuates Receiver-Alarm.

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

Handy Household Helpers



GD-51A
$22.95
$5 mo.

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

Wireless intercom units are an invaluable aid around the house . . . they pleasantly eliminate needless shouting and time-consuming running around. Just plug the GD-51's into any AC or DC outlet in the rooms you want to communicate with—no lines to string between units. Simple to use. Push the Press-To-Talk bar to talk, release to listen. The PTT bar has a spring return to the "listen" position and a handy "dictate" hold position for keeping tabs on the baby or for predominately one-way conversations. The variable squelch control quiets background noise, but still lets you receive normally—great for high noise level areas such as workshops, etc. Each GD-51 functions as a master station, so use as many as are required—perfect for general paging conditions, 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:** 6¼" H x 8" W x 7½" D.



All 3 Units
$44.85
$5 mo.

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:** 6¼" H x 8" W x 7½" D (master), 5" H x 8" W x 6" D (indoor remote), 5¾" x 4½" panel size (outdoor remote).

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 5¼" 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.

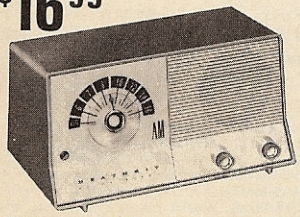
Kit GR-36, 17 lbs....no money down, $7 mo.....**$69.95**

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:** 2½ watts EIA. **Speakers:** Two 5¼" 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 9¼" H x 6½" D.
*Rated by Institute of High Fidelity (IHF) standards



GR-36 **$69.95**
$7 mo.

GR-10
$16.95



• Transformer operated • Superheterodyne circuit • Vernier tuning

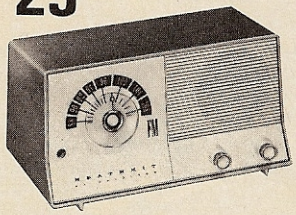
AM Table Radio . . .
Ideal For Any Room In The House!

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 pretuned for fast assembly . . . goes together in only 4 hours. Handsome ivory & beige plastic cabinet!

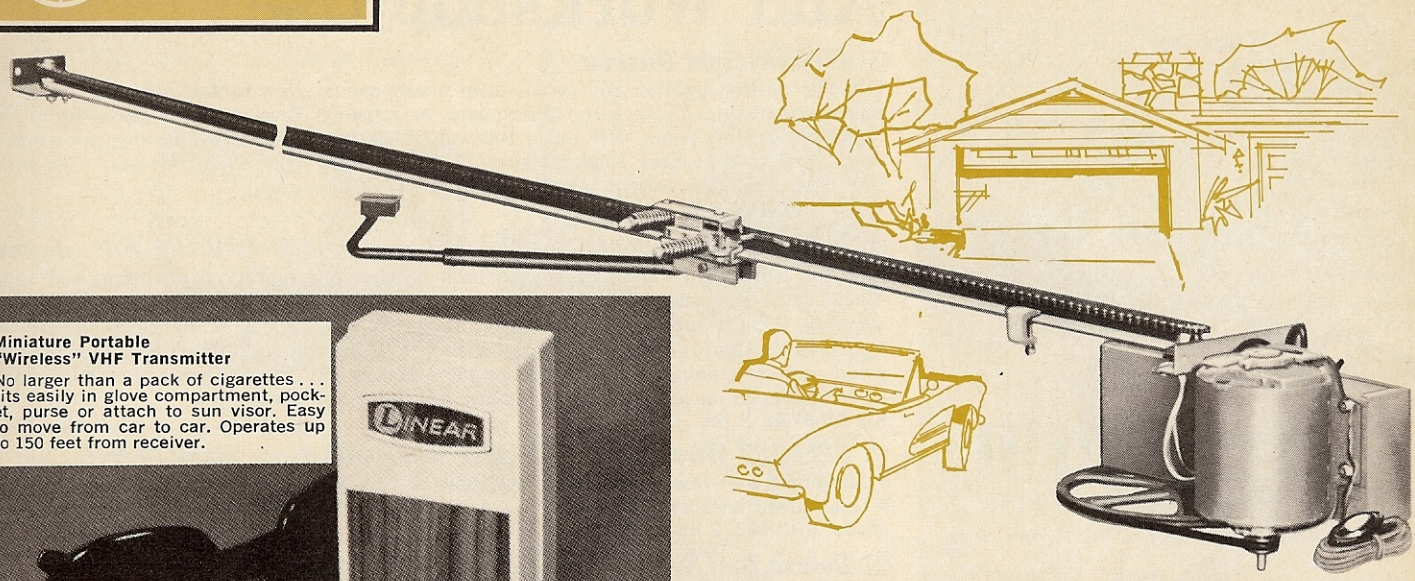
Kit GR-11, 7 lbs. **$23.50**

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.

Heath Has The World's Largest Selection Of Electronic Kits—Over 300 To Choose From

AUTOMOTIVE

Garage Door Opener

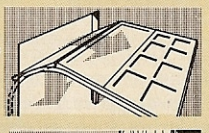


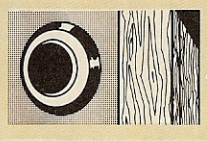
Miniature Portable "Wireless" VHF Transmitter

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

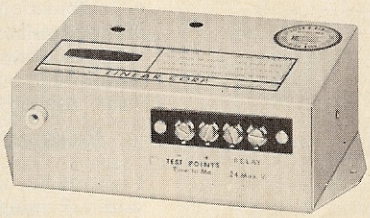
Motor and mechanism will operate overhead and most jamb or pivot type residential garage doors . . . sizes up to 8′ high! Requires just 2½″ clearance above highest point of door travel.





Manual Operating Switch

Supplied with your Kit, can be connected inside your house in any convenient place to permit opening the garage door without the use of the radio transmitter in your car.



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 5½″ x 3¾″ x 2″ size.

Kit Form Mechanism
Assembled Transmitter & Receiver

GD-177A

$112.95

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**

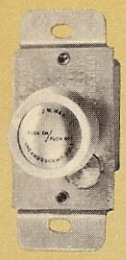
GDP-147, 2 lbs. (1) transmitter, (1) receiver . . no money dn., $5 mo. **$49.95**

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 8⅝″ high x 13″ wide, 100# max. operating force. Operates overhead track and most jamb & pivot doors up to 8′ high. 117 v. AC ¼ 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:** 3¾″ x 2¼″ x 1⅛″. **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. 5½″ x 3¾″ x 2″. **Power Requirements:** 105 to 140 volts 60 Hz 0.8 watt nominal. **Relay Voltage:** 24 volts NEC Class II circuit.

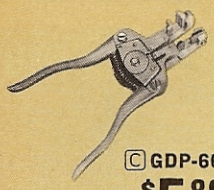
Tools And Accessories For Kit-Building And Workshop Use



Ⓐ GDP-166
$7.95

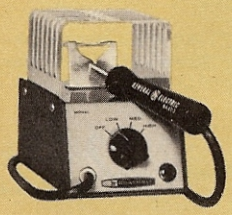


Ⓑ Kit GD-973A
$17.50



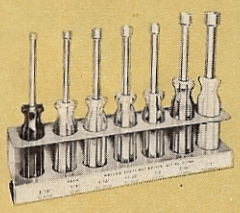
Ⓒ GDP-663
$5.89





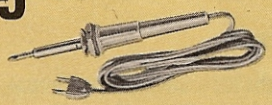
Ⓓ GH-25
$16.95

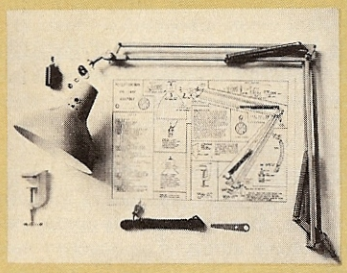
Ⓔ Kit GH-17
$14.95



Ⓕ GDP-204
$6.42

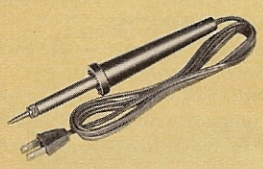
Ⓖ GDP-105
$5.40

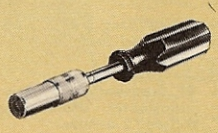




Ⓗ GDP-202
$9.95

Ⓘ GDP-207
$3.82





Ⓚ GDP-257
$3.99

Ⓐ *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**

Ⓑ *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**

Ⓒ *SPEEDEX 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. . . Mftrs. list $9.95 . . . . . **Only $5.89**

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

• Combination 4″ wire stripper & diagonal sidecutter • 4½″ Midget longnose pliers (with plastic insulated handles); 3 screwdrivers with amber plastic handles (3/32″, ⅛″, 3/16″) • "Little Dandy" soldering iron (below) • 5 nut drivers 3/16″, ¼″, 5/16″, ⅜″, ½″) • Nut starter, soldering aid, radio solder, and "Kit-Builder's Guide" with soldering instructions.

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

Ⓔ *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 ¼″ 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. Line-isolating 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, ¼″ chisel, 1 lb., **$3.99; GDP-327,** 3/16″ pyramid, 1 lb., **$3.99; GDP-337,** 3/16″ chisel, 1 lb., **$3.99**

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

• 7 drivers—sizes: 3/16″, ¼″, 5/16″, 11/32″, ⅜″, 7/16″, ½″ • 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**

Ⓖ *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**

Ⓗ *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. . . Mftrs. list $14.50 . . . . . **Only $9.95**

Ⓘ *WELLER W-PS 25-Watt Pencil Soldering Iron*

Perfect for kit-building, miniature soldering and production work. Tip developes 860 degrees maximum, brings work to higher temperature faster than most. Recommended by famous consumer product review magazine. ⅛″ 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**

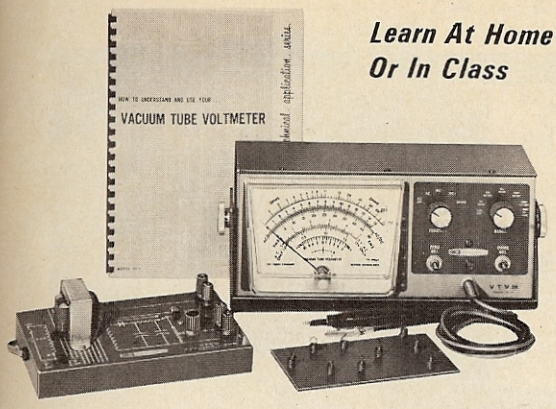
Ⓙ *SOCK-O-MATIC D8-141 . . . Four Wrenches In One*

Takes the place of 4 different size socket wrenches . . . automatically fits any size hexagonal nut, screw or bolt within its ¼″ to 7/16″ range (¼″, 5/16″, ⅜″, 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 7¾″. Diameter of end of barrel ⅝″.

Model GDP-257, 1 lb. **$3.99**

Heathkit® Educational Series

Learn At Home Or In Class



EF-1
Text & Chassis
$9.95

EF-1-4
Text & Instrument
$44.50

"How to Understand & Use Your Vacuum Tube Voltmeter"

Learn the theory, advantages and applications of the Vacuum Tube Voltmeter . . . use this Heathkit combination kit and textbook. A special power supply lets you learn-by-doing, experiments are outlined in the text. Material in the text is arranged to assist the beginner and the professional alike. Real value, and an opportunity to get the most out of your VTVM.

Kit EF-1, Text and special power supply (for VTVM owners), 3 lbs. **$9.95**
Kit EF-1-3, Includes EF-1 and IM-11 VTVM, p. 72, 8 lbs. . . no money dn., $5 mo. . . **$37.00**
Kit EF-1-4, Includes EF-1 and IM-13 VTVM, p. 71, 10 lbs. . . no money dn., $5 mo. . . **$44.50**
Manuals Only For EF-1 (single copy). . . . **$5.00**
(10 or more copies). . . . . ea. **$3.00**



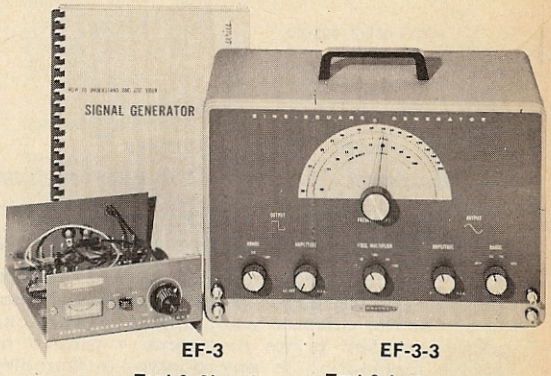
EF-2
Text & Chassis
$10.95

EF-2-3
Text & Instrument
$70.95

"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. **$10.95**
Kit EF-2-3, includes EF-2 and IO-21 Oscilloscope, p. 85, 16 lbs. . . no money dn., $7 mo. **$70.95**
Kit EF-2-5, includes EF-2 and IO-18 Oscilloscope, p. 84, 28 lbs. . . no money dn., $9 mo. **$94.00**
Manuals Only For EF-2 (single copy). . . . **$5.00**
(10 or more copies). . . . . ea. **$3.00**



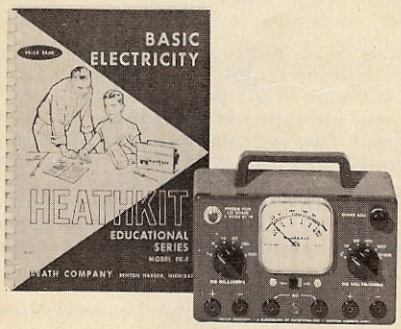
EF-3
Text & Chassis
$12.95

EF-3-3
Text & Instrument
$64.95

"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. **$12.95**
Kit EF-3-2, Includes EF-3 and IG-102 Signal Generator, p. 79, 10 lbs. . . no money dn., $5 mo. **$40.95**
Kit EF-3-3, Includes EF-3 and IG-82, p. 78, Sine-Square Generator, 18 lbs. . . no money dn., $7 mo. **$64.95**
Manuals only for EF-3, (single copy). . . . **$5.00**
(10 or more copies). . . . . ea. **$3.00**



EK-1
$21.50

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. **$21.50**



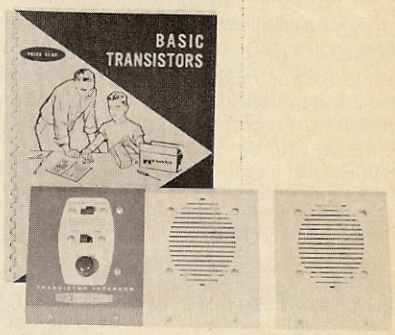
EK-2A
$19.95
(less cabinet)

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. **$19.95**
Basic Radio Part II (EK-2B), 5 lbs. **$19.95**
AK-8, Cabinet for completed receiver, 3 lbs. **$3.95**



EK-3
EI $17.95

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. **$17.95**

HEATHKIT®

Photography Aids

Solve The Darkroom Dilemma Of "Which Paper, What Exposure?" The Heathkit Fotoval® Computer Automatically Determines Correct Paper Grade & Exposure Time. Make Perfect Prints At This New Low Price

• 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 Computer. Place the negative you wish to print in the enlarger. With the Fotoval Computer 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 Computer 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 Computer & 35mm Calibration Negative, 8 lbs. . . . no money dn., $8 mo. **$75.00**
Optional test negative for 4″ x 5″ enlargers available. Order PMA-14-1, $15.00 ppd.



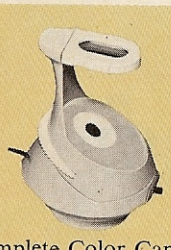
Easy, Accurate Exposure Control With The Heathkit Photo Timer . . . 0.1 Second to 99 Seconds Range . . . All Electronic Circuitry

• Controls exposure time of all printing operations—contact or enlarging • Two switch-selected ranges . . . up to 99 seconds in 1 second steps or 9.9 seconds in 0.1 second steps . . . permits accurate resetting of any interval • Repeatability accurate to within 2% on all settings • Two AC outlets . . . enlarger & safelight • All-electronic circuitry . . . no gear drive mechanisms to wear out as with "clock-motor" devices • Enlarger may be turned on or off manually with Time-Focus rocker switch • Install on wall, place upright or face up on working surface • Styled to match Heath/Mitchell Fotoval® Computer • Easy to assemble and use

QUICK & SIMPLE TO USE! Just set the desired exposure time and push the "start" button. The PT-15 Photo Timer turns the enlarger on and the safelight off. At the end of the preselected interval, it automatically turns the enlarger off, and the safelight on. To quickly expose more than 1 print, just push the "start" button to repeat the cycle . . . every exposure will be accurate within 2% of the first interval. A spring-return "stop" switch halts exposure process, if you decide the time interval is incorrect.

Kit PT-15, 4 lbs. . . no money dn., $5 mo. **$27.95**
Assembled PTW-15, 4 lbs., no money dn., $5 mo. **$49.95**

PT-15 SPCIFICATIONS—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: 6⅝″ W x 6½″ D x 3¼″ H overall.



NEW!

Convert Your Fotoval To Handle COLOR—With The Fotoval® Computer Color Probe!

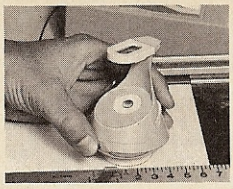
Complete Color Capability. The Fotoval Computer Color Probe Kit will be a welcome addition to the many darkrooms now using the Fotoval Computer for B&W work. The color probe is identical to the one used with the Colorval Computer and delivers the same accurate, repeatable results. Just wire the power supply into the chassis of your present Fotoval Computer, make up the Scan Filter Pack and you're on the way to some of the finest color prints you've ever seen. Kit comes complete with Mitchell Color Wheel, Scan Filter Pack, Power Supply and Color Probe. Order now for the best investment you'll ever make in color equipment.
Kit PMA-14-2, 4 lbs., no money dn., $5 mo. **$49.00**

Colorval Darkroom Computer, Kit or Assembled

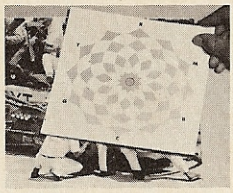


Kit PM-17 $89.00 $9 mo.

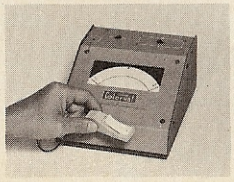
Wired PMW-17 $125.00 $12 mo.



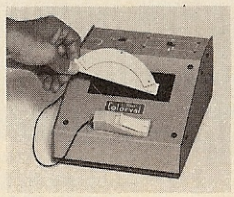
Unique Color Probe . . . helps you visually select the ideal printing filter combination. Features ball socket base for easy handling in any area of the enlarger easel . . . Scan Filter Pack to handle neutral highlights or flesh tones . . . adjustable brightness control . . . and a Neutral Reference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

Reduce Paper Costs, Cut Darkroom Time, Speed Enlarging AND Make Beautiful COLOR PRINTS Each Time—Everytime . . . With The Heath/Mitchell COLORVAL® Darkroom Computer. Money-Saving Kit Or Factory Assembled Models

• Accurately indicates ideal filter combination and correct exposure time for printing color negatives • Also functions like the Fotoval Computer in printing black & white negatives • Unique Color probe helps you to visually determine exact color correction • Separate light-sensitive exposure probe • Same 35mm test negative as used with Fotoval Computer 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 Computer. And besides showing you how to produce beautiful color prints, the new Colorval Computer 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 Computer is an aid to more efficient enlarging. The creativity is still left to you. Colorval Computer is like a co-pilot . . . 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 Computer 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 Computer, is used to measure extremely small light areas within 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 Computer 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 Computer 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 Computer 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.

Kit PM-17, 6 lbs. . . no money dn., $9 mo. **$89.00**
Assembled PMW-17, 6 lbs. . . no money dn., $12 mo. **$125.00**

PM-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:** 105-125 or 210-250 volts AC, 50/60 Hz, 15 watts max. **Cabinet dimensions:** 7¼" W x 4½" H x 8½" D. **Net weight:** 4½ lbs.

5-Channel Digital Proportional R/C System



Kit GDA-47-1
Transmitter with rechargeable battery
$86.50
no money dn., $9 mo.



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 • Flight weight with four servos, 20 oz.

"Full House +1" Operating Versatility. Designed by Kraft Systems, Inc. and put into kit form by Heath, this 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 25 hours from parts to installation and you save over $200!


Kit GDA-47-2
receiver only
$49.95
$5 mo.


Kit GDA-47-3
rechargeable receiver battery pack
$9.95


Kit GDA-47-4
servos (each)
$21.50

Complete R/C System
Save $12.45
Kit GD-47
$219.95
$21 mo.

System includes Transmitter, Receiver, 2 Battery Packs, and 4 Servos

Good News For R/C Modelers . . . The Heathkit/Kraft 5-Channel Digital Proportional System Costs Just $219.95

A "full house" of time proven circuitry, rugged and reliable. a winner in all respects and, best of all, it saves you hundreds of dollars of the cost of comparable equipment. The Heathkit R/C system includes 5-channel transmitter, 5-channel receiver, four servos, two nickel cadmium battery packs, all necessary cables, switches, and connectors . . . everything you need to put your model under radio control operation.

System Kit GD-47, all system parts; specify freq. desired; 11 lbs., no money dn., $21 mo. . . (saves $12.45) **$219.95**

Heathkit 5-Channel Digital Proportional Transmitter

• 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 • Greater control range • Antenna telescopes into case • True d'Arsonval meter shows relative power output and battery condition • Built-in battery charger with indicator light for both transmitter and receiver • 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 your model, you're in command. Efficient RF circuitry (0.8 watt input, 0.4 watt output) gives long range control. Five channels give complete control of all aircraft functions. Trim adjust tabs give accuracy. Digital circuitry gives reliable transmission of information.

Easy to build. RF circuitry of the transmiter is already assembled and aligned to assure peak performance of your completed kit. The 12 silicon transistor, 10 diode circuit uses fiberglass boards for rugged reliability. Power is supplied by a 9.6 v, 500 mah. nickel cadmium rechargeable battery; operates 4 hours minimum per charge; battery charger is built-in for both transmitter and receiver batteries; meter on transmitter shows when battery needs charging; AC line isolation protects against shock during charging. You'll complete assembly of the transmitter in about 5 hours. **Easy to use.** Just pull up the 54" telescoping antenna, turn on the switch and you're ready. The transmitter fits easily in your hand (rounded edges of the blue enameled case fit the natural curvature of your hand) . . . and it weighs just 2¾ lbs., measures just 6⅜" H x 6¾" W x 2⅝" D.

Kit GDA-47-1, transmitter, battery, charging cord; specify freq., 5 lbs., no money dn., $9 mo. **$86.50**

Sensitive Solid-State Heathkit 5-Channel Receiver

• Highly sensitive • 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 4 hours minimum 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. Thats the Heathkit R/C Receiver. Uses 11 transistors, 5 SCS devices, and 7 diodes. 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 enameled aluminum case of the 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 500 mah rechargeable battery. Although compact (just 2⅞" H, by 2⅜" 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.

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

Unique Heathkit/Kraft Variable Capacitor Servos

• 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 . . . Fast, exact, this 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 wire-wound types of feedback.

Powerful, Versatile. Inside its small, tough nylon case is a powerhouse . . . a full 3¼ lb. minimum 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, 2⅛" L), it fits anywhere, in any position. The 9-transistor circuit mounts on a fiberglass circuit board . . . all nylon gears, shafts, and case fit together accurately. All necessary cables, connectors, and grommets are included.

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

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

Professional Shortwave Receiver



SB-310
$249.00
(less speaker)
no money dn., $23 mo.

Communications-Quality SWL Receiver Tunes AM, SSB and CW . . . 10 Bands . . . 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 • Bandspread 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 SB-310! Designed for the "professional" shortwave listener who wants a communications-quality receiver without a budget-breaking price. Features selectivity that slices stations down to the last kHz . . . no more guessing station identities . . . you return to the *exact* frequency every time. And it boasts sensitivity that pulls in weak stations with amazing clarity and sensitivity . . . makes DX-ing a breeze. Your experienced hand will appreciate the "solid" feel of the non-backlash vernier dial. And it's rock-stable . . . no annoying drift.

10 Switch-Selected Bands. 49, 41, 31, 25, 19 and 16 meter shortwave . . . 11 meter CB . . . and 80, 40 & 20 meter amateur bands. And to receive AM, CW and SSB with crystal-clear fidelity, a 5 kHz crystal filter is included. For optimum CW and switch-selected upper and lower sideband coverage, optional narrower bandwidth filters are also available—see price lines.

Famous Heathkit SB-Series Features Insure Finest Listening. Features like a crystal-controlled front-end for same tuning rate on all bands . . . true linear tuning with 1 kHz dial calibrations (100 kHz per dial revolution) and a bandspread equal to 10 feet per MHz . . . tuning dial to knob ratio of approximately 4 to 1 . . . built-in switch-selected automatic noise limiter . . . prebuilt & aligned Linear Master Oscillator (LMO) for good "solid" tuning . . . separate RF and AF gain controls . . . calibrated "S" meter . . . switch-selected mode switch . . . separate diode (AM) and product (SSB, CW) detectors . . . built-in 100 kHz crystal calibrator . . . headphone jack for DX-ing. "Sub-pack" packaging for easy 20-hour kit assembly . . . modern "low-boy" styling. Requires only a VTVM for final alignment. For a matching speaker, choose the SB-600. For the finest shortwave listening, choose the SB-310 receiver.

Kit SB-310 (less speaker), 24 lbs. . . 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 (2.1 kHz @6 db down; 7 kHz max. @ 60 db down). 1 lb. . . **$23.95**
SBA-310-2, Optional deluxe SSB filter plus crystal for switch-selection of USB & LSB (2.1 kHz @ 6 db down; 5 kHz max. @ 60 db down). Provides best SSB selectivity for maximum adjacent signal rejection. 1 lb., 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 ±10% line voltage variation. **Sensitivity:** Less than 0.3 uv 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:** 14⅞″ W x 6⅝″ H x 13⅜″ D. **Net weight:** 17 lbs. **External connections:** Front panel: phones. Rear Apron: antenna, mute 500 ohm audio output, speaker 8 ohm, hi-fi output, 1 spare socket, line cord socket. **Tube complement:** 11 tubes (14 functions). **Diode complement:** 8.



GR-81
$24.95 no money dn., $5 mo.

Low Cost Starter Kit For Beginning SWL's

• Covers 150 kHz to 18 MHz in 4 bands • Transformer operated power supply • Built-in speaker & headphone jack, metal cabinet • Easy to build—from parts to listening in 6 hours

Brings You International Stations . . . amateur radio bands . . . marine & aircraft broadcasts . . . government stations . . . and entertaining AM listening. Simple 3-tube regenerative circuit assembles easily in 6 hours . . . an ideal project for the beginner in radio and electronics! Features provisions for long & short antennas, "shock-free" tranformer-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), Bandspread, Bandswitch, Regeneration, on/off volume, phone jack. **Dimensions:** 10″ W x 7″ H x 7″ D.

Heath Has The World's Largest Selection Of Electronic Kits—Over 300 To Choose From

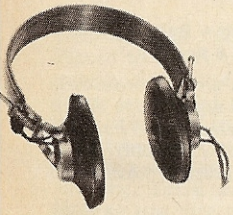


GR-54
$89.95

World-Wide Travels At Your Fingertips



GR-64
$39.95

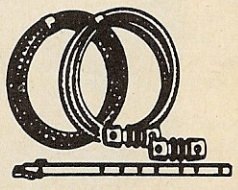


GD-396
$3.50

Superex Shortwave Headphones

FOR DX-ING, PRIVATE LISTENING! Use with all Heathkit shortwave and amateur radio receivers (except GR-43A). Features single lead convenience, vinyl-clad headband (1⅛" wide) dual coils, Alnico V magnets, 2000 ohm impedance. Not a kit.

GD-396, 1 lb. **$3.50**



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**

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

Professional Features Yet Modestly Priced . . . Deluxe 5-Band Shortwave Receiver . . . Includes FREE Antenna

• 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. **$89.95**

GR-54 SPECIFICATIONS—Frequency Coverage: Band A 180 kHz to 420 kHz; Band B 550 kHz to 1550 kHz; Band C 2 MHz to 5MHz; 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:** 120/240 V., 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:** 14⅝" W x 6⅝16" H x 10⅝16" D.

Via Heathkit® Shortwave Radios

Thrill To The Excitement Of Exploring New Worlds On This Low Cost 4-Band Receiver

• 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**

GR-64 SPECIFICATIONS—Frequency range: 550 kHz to 30 MHz in four bands. **Controls:** General coverage tuning, Bandspread tuning, Bandswitch, Noise Limiter—ON/OFF, Phone-Standby-CW switch, BFO control, Audio Gain, AC-ON/OFF, Headphone jack, Q-multiplier input. **Power requirements:** 120/240 V 50/60 Hz AC, 30 watts. **Dimensions:** 13½" W x 6" H x 9" D.

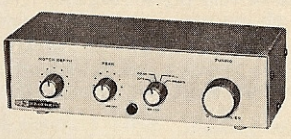
SHORTWAVE RECEPTION GUIDE

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
	17 MHz	All day	U.S.
	17 MHz	Evening	South America
13 M	20 MHz	Afternoon	Europe
	20 MHz	All day	U.S.
	20 MHz	Evening	South America
11 M	27 MHz	All day	Local Citizen's Band
10 M	28 MHz	Morning	Europe
	28 MHz	All day	Central America & U.S. Amateur
		Evening	Asia

These reception conditions prevail in the spring and fall of the year. They are also subject to varying atmospheric conditions, sun spot activities, and to some extent, weather conditions. In the winter, reception generally will be best on the lower frequency bands. In summer, reception will be better on higher frequency bands.

Improve Shortwave Reception with a "Q" Multiplier!

GD-125
$14.95



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. 120/240 V 50/60 Hz AC power supply.

Kit GD-125, 3 lbs. **$14.95**

SWL Station Guide

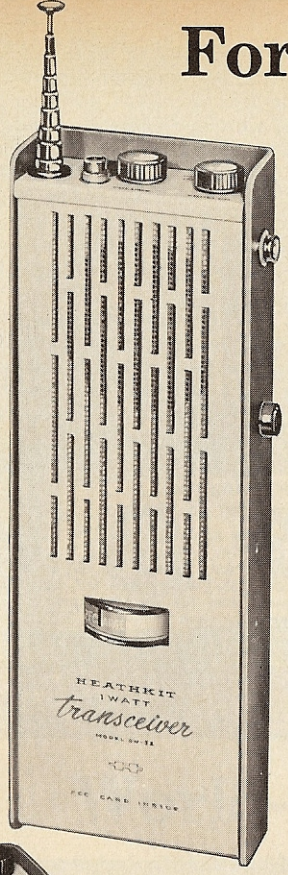
LATEST WORLD RADIO TV HANDBOOK! Lists AM, FM, TV and Shortwave stations . . . includes call signs, frequencies, transmitter power, address for QSL cards, program details, broadcast times, etc. 300 pages.

GDP-315, 2 lbs. **$5.95**



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

For The Most Value In Citizen's Band Gear



GW-52A
$64.95
(pair $119.95)

Now At A New Lower Price . . .
Powerful 1-Watt Walkie-Talkie . . . Operates Up To 3 Miles

• 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

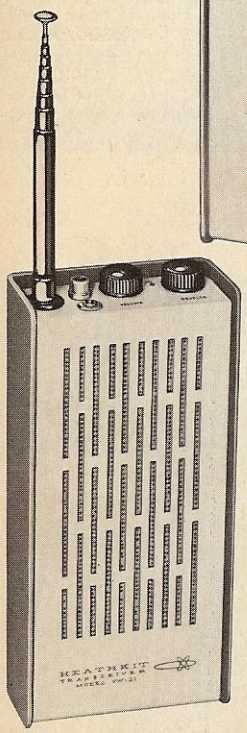
NOW SAVE $5 ON THIS VERSATILE HAND-HELD WALKIE-TALKIE that's ready to go anywhere for efficient 2-way communications up to 3 miles between units . . . 5 to 10 miles when used with an external antenna or 5-watt CB base stations. Features superhet receiver with RF stage to pull in weak stations with ease; adjustable squelch and automatic noise limiter; and all solid-state circuitry for cool, instant operation and long dependable life.

INCLUDES $20 RECHARGEABLE BATTERY . . . lasts 1500 to 5000 hours. And you can 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.

RUGGED LIFETIME CABINET . . . SIMPLE TO BUILD. 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:** ½ 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:** 2½" round, permanent magnet type. **Earphone jack:** Miniature-type (earphone supplied). **Meter:** Indicates battery condition. **Cabinet dimensions:** 10 15/16" H x 3⅝" W x 1 1/16" D.



GW-21A
$39.95
no money down,
$5 mo.
(pair $74.95)

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 3⅝" W x 1⅝" D.



GW-22A
$47.95

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

• 5-crystal-controlled transmit & receive channels • Superhet receiver with RF stage • Built-in squelch & automatic noise limiter • Push-to-talk microphone • Easy to build

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:** ½ 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:** 9¼" D x 6¼" H x 9½" W.

CLASS D CITIZENS BAND CHANNEL NOS. AND FREQUENCIES

†1. 26.965 MHz	‡ 9. 27.065 MHz	17. 27.165 MHz
2. 26.975 MHz	‡10. 27.075 MHz	18. 27.175 MHz
3. 26.985 MHz	‡11. 27.085 MHz	19. 27.185 MHz
4. 27.005 MHz	‡12. 27.105 MHz	20. 27.205 MHz
5. 27.015 MHz	‡13. 27.115 MHz	21. 27.215 MHz
6. 27.025 MHz	‡14. 27.125 MHz	22. 27.225 MHz
7. 27.035 MHz	15. 27.135 MHz	‡*23. 27.255 MHz
8. 27.055 MHz	16. 27.155 MHz	

†Cannot be used for unlicensed operation of GW-31A and GW-21A.

‡Communication between units of different licenses restricted to these channels; communication between units of the same license permitted on all channels.

*Shared with Class C Radio Control.

NOTE: Specify frequency choice. When ordering several units, specify frequency for each.

CAP Crystals at 26.620 MHz available for all models.

Extra Transmit & Receive Crystals. Only $1.99 each. Specify Heath Transceiver model. 1 lb.

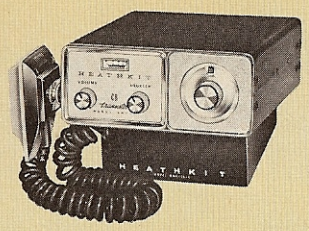
Special 23-Channel CB Package!
Transmit & Receive crystals for all CB channels . . . 46 crystals in all! A regular $91.54 value!

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

Save 5% When You Buy 2 Or More 5-Watt Transceivers; Just Deduct 5% From Order Blank

5-Watt CB Transceivers

HEATHKIT®



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**



Solid-State 5-Watt CB Transceiver . . .
23 Crystal Controlled Channels . . .
New Low Price . . . FCC Type Accepted
Factory Assembled Model . . .
Two New Money-Saving Systems . . .
Kit & 23 Channel Crystal Pack . . .
Or Assembled Model With Crystals
For all 23 Channels Installed

Kit GW-14A
Was $89.95
Now Only
$76.95

GWS-14A System
(Includes kit GW-14A & 23 channel crystal pack)
$152.95

Wired GWW-14A
Was $124.95
Now Only
$109.95

GWW-14AS System
(Includes assembled GWW-14A & 23 channel crystal pack)
$184.95

• 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 2⅞" H x 7" W x 10½" 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 • ½ 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 2⅞" H x 7" W x 10½" 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. Use must comply with Part 95, FCC regulations. Buy a pair and save 5%.

Kit GW-14A, 8 lbs. . . no money dn., $8 mo. . . (less crystals). **$76.95**
Assembled GWW-14A, 8 lbs., no money dn., $11 mo. (less crystals). . . . . **Now Only. . . $109.95**
GWS-14A, System: kit (GW-14A) plus 23 channel crystal pack. . . **$152.95**
GWW-14AS, System: assembled model (GWW-14A) plus 23 channel crystal set installed, no money dn., $11 mo. **$184.95**
Kit GWA-14-1, AC Power Supply, 5 lbs. **$14.95**
GWA-14-2, 23 Channel Crystal Pack, 1 lb., no money dn., $8 mo. . . **$79.95**
Extra Crystals (specify freq.), 1 lb. . . . . ea. **$1.99**

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:** ½ 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 mefer:** 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:** 2⅞" H x 7" W x 11" D.

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

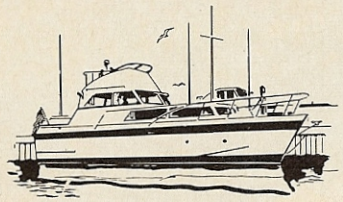
A regular $135.70 value! Includes transmit and receive crystals for all CB channels for complete GW-14 operation . . . a total of 46 crystals. For maximum versatility, this package is your best dollar value!
GWA-14-2, 1 lb. . . . no money dn., $8 mo. **$79.95**

Crystals Only $1.99 Each With Any Transceiver Order!

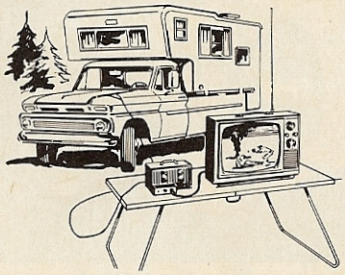
If you need more than 1 channel, order the extra crystals along with the GW-14 or any Heathkit transceiver for only $1.99 . . . a 96c savings . . . regularly $2.95 when ordered separately. Remember you need two crystals for each channel . . . one each for transmit and receive functions.

Use Heath's Free Technical Consultant Service—Write Them On Any Kit Subject

For Safety and More Pleasure Afloat

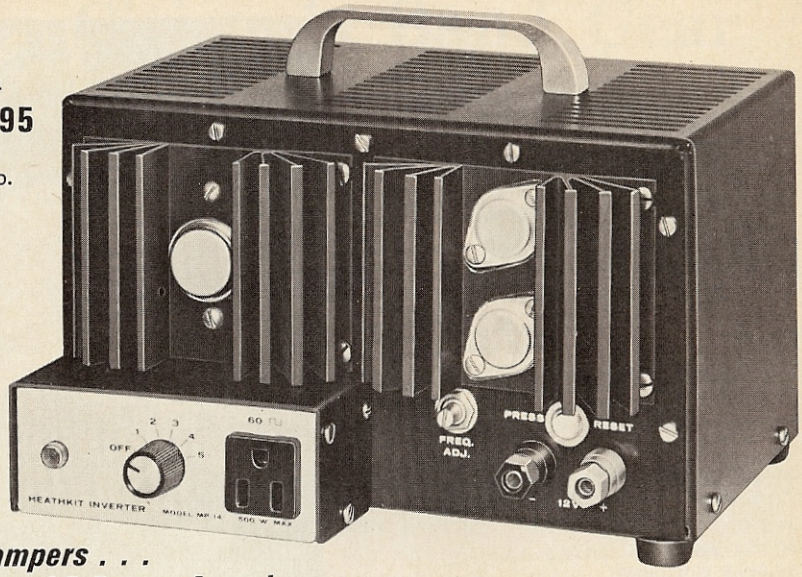


Shoreside power afloat, the new MP-14 Inverter powers Color or B&W TV's, power tools, radios, phonos, lights, etc., on any boat with 12 v.



Campers, Hunters, Fishermen, can enjoy the comfort and convenience of home while in the field with the MP-14 ready to power every small appliance, even tape recorders used for game calling.

MP-14
$99.95
$10 mo.



New High Power Inverter For Boats, Cars, Campers . . . Enjoy The Convenience of Home-Type AC Power Anywhere

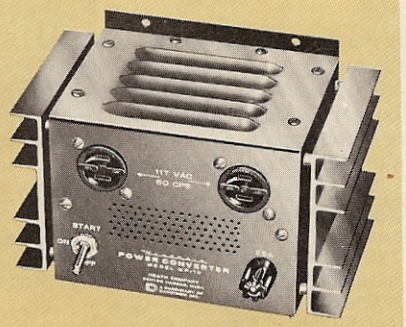
CONVENIENT, COMPATIBLE, COMPLETE. The MP-14 delivers up to 500 watts and has adjustable AC voltage output regulated at 60 Hz so you can operate high current, high wattage appliances such as Color TV, B&W TV, power tools, lights and also appliances which demand accurate frequency power such as phonographs, turntables, and tape recorders (operates anything within its power rating except motor driven devices having high starting currents, such as compressor type refrigerators). The remote control head plugs into the front panel for local operation or may be mounted separately wherever power is desired (inverter may be located in battery compartment). Instant-on solid-state circuit is protected by circuit breaker and special relay. Includes 8′ battery cable and 12′ remote control cable. Build it in an evening or two, connect it to any 12 v. boat or car battery and enjoy years of convenient AC power.

Kit MP-14, 29 lbs., no money dn., $10 mo. **$99.95**

MP-14 SPECIFICATIONS—Input voltage: 12 to 14.5 v. DC two wire isolated from ground. **Specification voltage:** 13.0 v. DC. **Input current:** 4 ampere, no load; 40 ampere at 400 watt load. **Allowable ambient temperature:** 0°F. to 125°F. **Efficiency:** 80% (approx.). **Output voltage:** Switch selected—120, 135, 150, 165 & 180 v. AC. **Output power:** 400 watts continuous up to 100°F.; 300 watts continuous up to 125°F.; 500 watts intermittent; 15 minutes "on"—15 minutes "off" at 100°F. max. **Frequency:** 60 Hz, adjustable. **Frequency regulation:** Load—1% no load to 400 watts; Input—2%, 12 to 14.5 v. DC; Temperature—3%, 0°F. to 125°F. **Wave form:** Square wave. **Protective circuits:** Input—50 ampere circuit breaker, DC polarity reversal diode. **Size:** 9½″ W. x 7¾″ H. x 6¾″ D.

Kit MP-10
$29.95

Wired MPW-10
$39.95



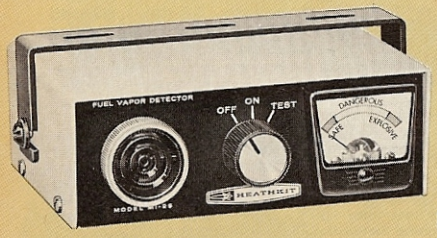
Low Cost Heathkit Marine Power Inverter

• 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

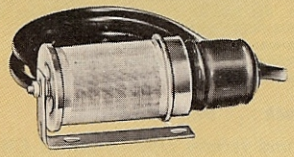
A COMPACT SOURCE OF HOUSEHOLD POWER FOR SMALL APPLIANCES . . . such as electric razors, lamps, etc. Not recommended for tape recorders, record players, or compressor-type refrigerators, requiring high starting current or sine wave AC. Write for MP-10 applications bulletin.

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.



Kit MI-25
$39.95
$5 mo.



Heathkit Fuel Vapor Detector Provides Visible and Audible Warning

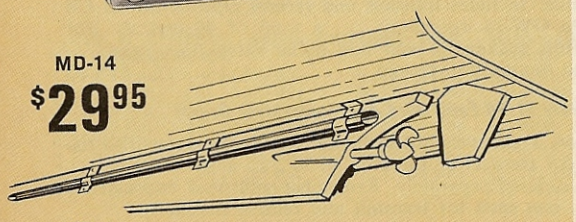
• New more dependable circuitry • Fully transistorized • Gives both visual and audible warning of combustible gas fumes • Self-testing • Built-in "Fail-Safe" provision–sounds alarm in the event of component failure • Built-in relay circuits for control of bilge blower & additional warning devices • Simple to build and install–from package to protection in 3 hours

You can't afford to overlook any safety precaution when at sea, and a fuel vapor detector is extra assurance against explosion. The MI-25 has the sensitivity and reliability you need with a detector head that's performance proven and new silicon transistor circuitry for long period dependability plus built-in fail-safe features. Meter shows "Safe-Dangerous-Explosive" and alarm sounds when fumes are present. Assembly manual gives accurate checkout procedure.

Kit MI-25, 3 lbs. . . no money dn., $5 mo. **$39.95**

MI-25 SPECIFICATIONS—Voltage: 12 VDC, +10%. **Current:** 1.0 amp nominal. **Panel size:** 2-1/16″ H x 5-11/16″ W. **Depth:** 5″. **Detector head size:** 1½″ round x 2½″ long. **Length of interconnecting cable supplied:** 15′. **Color:** Marine white & black. **Material:** Aluminum. **Temp. range:** —20° C. to +80° C. **Audio alarm:** 2500 Hz.

MD-14
$29.95



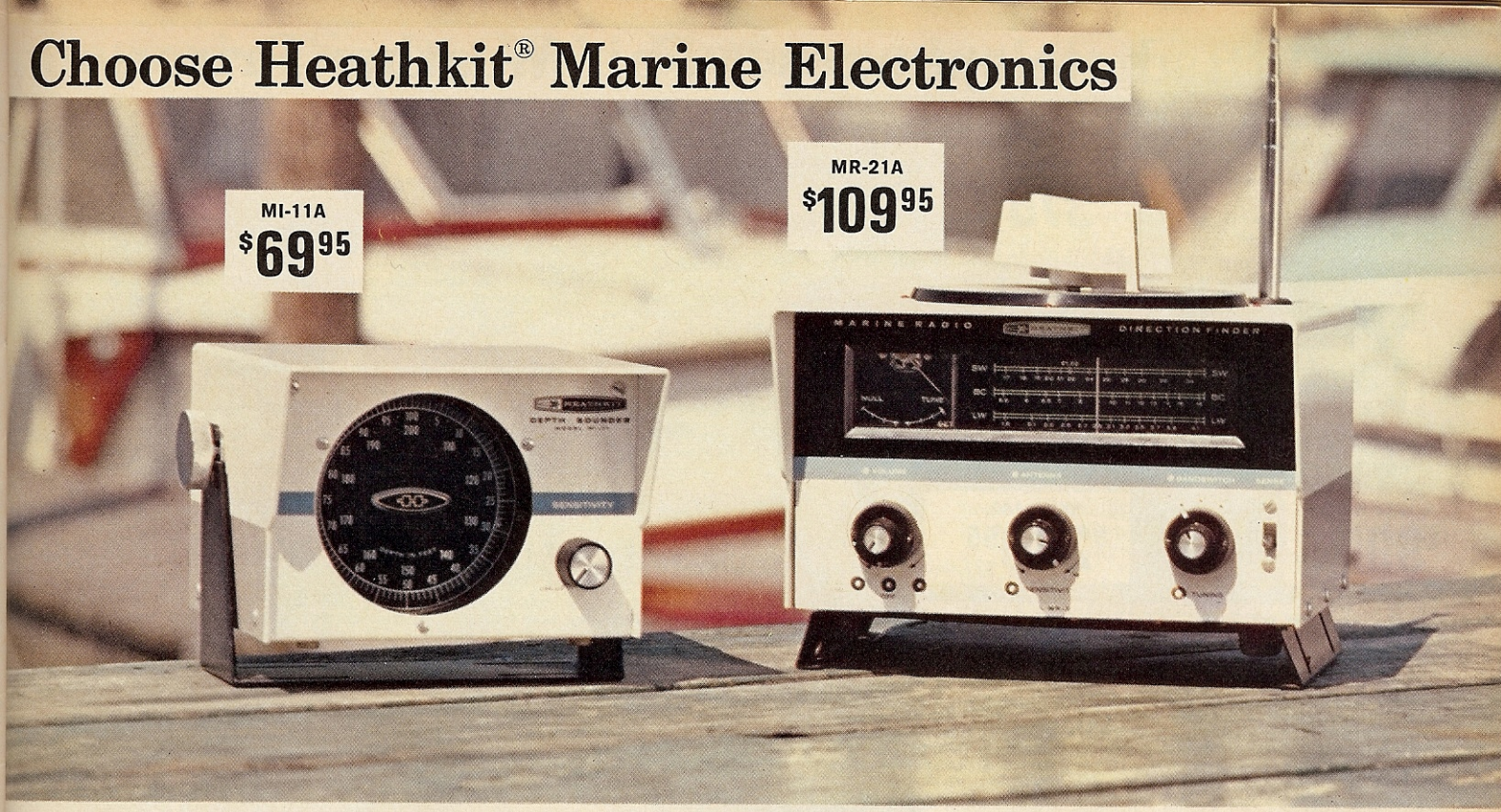
Marine Radiotelephone Ground System

THE MOST FREQUENT CAUSE OF POOR RADIOTELEPHONE RANGE IS A POOR GROUND . . . MD-14 provides more than adequate 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**

Heathkit Performance Specifications Are Guaranteed

Choose Heathkit® Marine Electronics



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:** 7¼" W x 5¼" H x 7½" 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–independent 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" weatherproofed. **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 8½" D, including base and loop.

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

Heath Radiotelephones... Fair Weather Prices... Foul Weather Friends



Ⓐ *Heath 150-Watt Radiotelephones—Performance Plus*

• 150 watt input • Very low current drain for a 150-watt 'phone • 8 crystal-controlled channels • Covers 2-3 & 4-5 MHz marine bands • Tunes AM broadcast • Built-in 15 watt deck hailer • Full provisions for use with MWA-15-1 Remote Unit • High-performance solid state receiver with RF amplifier stage • Ceramic Transfilters® for more selectivity • Built-in heavy duty power supply • FCC type-accepted for commercial (party boat) use & DOT approved • Completely assembled & tested • Owner's manual includes all information for installation & operation

Advanced Features Not Found On Many Other Radiotelephones—Never At Such A Low Cost . . . such as automatic noise limiting, variable squelch control, provisions for remote monitoring, panel meter for receive/transmit signal strength, separate antenna loading for maximum power on each channel, rust-proof exterior hardware, relays sealed against dust and corrosion, fungus-proof spray on components, capability of being installed at any angle, and an honest 80 watts output. And you can install this radiophone yourself! The owner's manual is complete in every respect. All FCC license information, and forms are included. Crystals for 2182 & 2638 kHz are included . . . specify additional channels (2 crystals/channel) . . . see listing below. Just have the final tune-up made by a 1st or 2nd class FCC licensed technician.

Assembled MWW-15, 31 lbs. . .$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. . . . . each **$2.95**

MWW-15 SPECIFICATIONS—RECEIVER: Frequency range: Marine, 2-5 MHz; Broadcast, 540-1620 kHz. **Sensitivity:** (providing 10 dB S/N ratio or better) Marine channels, 2 microvolts; Broadcast, 10 microvolts. **Audio output:** 3 watts to internal speaker/provision for external speaker; 15 watts to PA "deck-call." **Transistor complement:** (1) 2N1526 R.F. Amplifier; (4) 2N1525 Marine Crystal Oscillator Mixer, 2nd I.F. & 3rd I.F.; (1) T1364 1st I.F.; (3) 2N1274 AGC Amplifier, 1st & 2nd Audio; (2) R265A (2N1039) Audio Output; (4) SP838, (2) Modulator—(2) Power Inverter; (11) Diodes. **TRANSMITTER: Frequency range:** 2-5 MHz marine bands. **RF Input:** 150 watts. **RF Output:** 80 watts. **Transmitter tube complement:** (1) 12BY7 Colpitts Oscillator; (1) 6HF5 Power Amplifier. **Power requirements:** 12 volts DC. Receiver only, 0.6 amp. Standby, 2.9 amp. Transmit, 20 amps. **Dimensions:** 6½" H x 11¼" W x 17" D.

Ⓑ *Full Remote Control Operating Facilities For Heath Radiotelephones*

• The smartest remote control to complement the bridge of any boat • Full remote control for MWW-14A or MWW-15 radiophones • Includes on/off, volume, squelch, mode switch, and channel selector • Telephone handset • Universal gimbal mounting bracket • Completely factory assembled with detailed installation/operating manual included • Styled to match MWW-14A & MWW-15 • Includes 25' of interconnecting cable with all connectors preassembled

Choose MWW-15R Or MWW-14AR For The Radiophone And Remote Combination . . . all channel switching provisions are factory installed and both units are ready to place in your boat. If you already own an MWW-14A or MWW-15, order MWA-15-1 . . . this includes the Remote, all necessary hardware (25' of cable with connectors assembled), plus channel switching drive motor and instructions for installation in your Heath radiophone.

Assembled MWA-15-1, 10 lbs. . .no money dn., $10 mo. **$99.00**

Ⓒ *Heath MWW-14A . . . Unequalled Value & Performance In A 75 Watt Radiotelephone*

• 6 crystal-controlled transmit and receive channels (2-5 MHz) • Exceptionally low current demands for a 75-watt radiophone • AM broadcast band tuning • 15 watt deck hailing capability • Transistorized receiver • Factory assembled & tested • FCC type accepted for "party-boat" use and D.O.T. approved

Here Is A 75-Watt Input Radiotelephone That Brings Marine Electronics Up To Date. Compact size, modern solid-state circuitry, and a design "human engineered" for convenience have made the MWW-14A an outstanding example of modern marine electronics. Look over the styling . . . read the specifications. You'll agree the MWW-14A is your best buy in its power class.

Valuable Owner's Manual . . . gives full installation and operating instructions. Requires FCC licensed technician for tune-up. Crystals for 2182 & 2638 kHz included.

Assembled MWW-14A, 30 lbs., no money dn., $27 mo. **$289.95**
Assembled MWW-14AR, 41 lbs. . .75-watt Radiophone plus Remote Control. . .$39 dn., as low as $25 mo. **$388.95**
Extra transmit & receive crystals (specify), 1 lb. . . . . each **$2.95**

MWW-14A SPECIFICATIONS—RECEIVER: Frequency range: Marine, 2-5 MHz. Broadcast, 540-1620 kHz. **Sensitivity:** (providing 10 dB S/N ratio or better) Marine channels, 2 microvolts; Broadcast, 10 microvolts. **TRANSMITTER: Frequency range:** 2-5 MHz marine bands. **Final power input:** 75 watts. **RF output:** 40 watts. **Power requirements:** 12 volts DC. Receiver only, 0.6 amp. Standby, 2.9 amp. Transmit, 16 amps. **Dimensions:** 6½" H x 11¼" W x 17" D.

18' Radiophone Antenna

Husky, 2-section fiberglass antenna. Botton section 10' long, top 8' whip. Complete with lay-down swivel base & high-impact side-mount.
MDP-13, 12 lbs., Express or Motor Freight Only.
no money down, $6 mo. **$59.95**

24' Marine Antenna

Ideal for use with MWW-15. 2-section fiberglass. Bottom section 13' long, top an 11' whip. Complete with lay-down swivel base & high-impact side-mount.
MDP-74, 14 lbs., Express or Motor Freight Only.
no money dn., $7 mo. **$69.95**

Heath 25 Watt Radiotelephone For Medium Cruising-Range Craft

• Choose the complete MWW-13AS system for owner installation on outboards • Choose the MWW-13A for installation on any boat with FCC licensed technician checkout • Features 4 crystal-controlled transmit & receive channels • Covers 2-3 MHz marine bands • Exceptionally low current demands • Receives AM standard broadcast • Built-in heavy-duty solid-state power supply • FCC type accepted • Compact, factory assembled & ready to install

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. **Transistor complement:** (1) 2N1526 Mixer; (1) 2N1525 Oscillator; (1) T1364 1st I.F..; (1) 2N1274 1st Audio; (3) 2N1039 Audio Driver & Power Converters; (2) 2N1525 2nd & 3rd I.F.'s; (2) 2N301 Audio Output Modulator; (6) diodes, AVC, overload, Squelch, Noise Limiter & Detector. **Transmitter RF input:** 25 watts. **RF Output:** 13 watts. **Transmitter tube complement:** (1) 6AK6 Oscillator; (2) 6AQ5 amp. **Power requirements:** 12 V DC; broadcast receiver only, .350 amps.; standby, 1.2 amps.; transmit, 5 amps. **Dimensions:** 4½" H x 8¼" W x 10½" D.



Use Heath's Free Technical Consultant Service—Write Them On Any Kit Subject

Improve Your Car's Performance

HEATHKIT®



IO-20
$99.50

Tell-tale Patterns Show Ignition System Condition

Diagnose Auto Ignition Problems Quickly, Efficiently With This Versatile Analyzer

• Spots ignition troubles–shows results of corrective action • Just flip a switch to select any of 4 different patterns without switching leads • Expand any view horizontally or vertically for a "closer look" • Easy to use–detailed instruction manuals provided for simple assembly and operation • Use on any internal combustion engine with conventional, non-transistor ignition system*

HELPS KEEP YOUR CAR RUNNING SMOOTHLY . . . identifies shorted spark plugs, bad points, defective wiring, worn distributor parts, incorrect dwell time, coil and condenser problems, plus many more engine defects. Use it in the shop with its own built-in power supply, or "on-the-road" with an external DC to AC inverter.

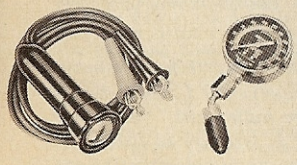
SELECT 4 DIFFERENT PATTERNS WITHOUT SWITCHING LEADS. A special switching system provides instant selection of primary and secondary patterns in either parade or superimposed displays without the bother of lead switching. Expand the views for detailed analysis . . . 10 to 1 horizontally or 2 to 1 vertically. 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 trouble-shooting, 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 ¾", 12 volt system 1". **Vertical expand ratio:** 2 to 1. **Horizontal expand ratio:** 10 to 1. **Cable length:** 12' pick-up clamp, ground and secondary clip leads extend 2' beyond pick-up clamp. **Power requirements:** 105-125 V, 50/60 Hz AC, 30 watts.

**It is impractical to portray the patterns produced by the many different ignition systems (transistor, SCR, Capacitor Discharge, Induction pick-up, etc.) currently used experimentally. In most cases the IO-20 will function satisfactorily and with a little experience the display will prove equally meaningful to the user as conventional systems. Heath Company can NOT supply advice on interpretation of such displays.*



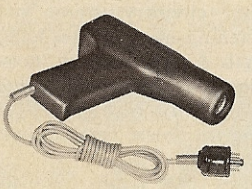
GFP-83
$11.95



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**

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

The Incomparable Heathkit® AR-15...

The Finest Stereo Receiver You Can Buy—Anywhere!

Advanced Features!

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

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

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

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

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

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

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

READ WHAT RESPECTED AUDIO CRITICS SAY:

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

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

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

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

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

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

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

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

AR-15 Kit-Builder James P. Holmes, Goleta, California: *"The AR-15 is the first Heathkit that I've built. I was a little worried about spending over $300 for a kit, but it went together without a hitch. The completed receiver works great. I still find it hard to believe that such a complex piece of equipment can be successfully kitted. I think the AR-15 kit is the greatest buy in the Hi-Fi market today."*

Mr. Carl E. Holt, AR-15 owner from Stillwater, Minnesota, writes: *"The sound is terrific and the performance is fine. I want to compliment the design engineers whose fine work helped it go together so easy. The instruction book is a fine piece of writing and so complete that assembly is a breeze."*

AR-15 Kit-Builder J. H. Manwaring, Navarre, Ohio: *"I have worked with radio and T.V. since 1926 and I don't believe all I read when it comes to claims and specs for kits and factory built units." "However . . . this unit is as good as you claim it to be. It is a joy to listen to." "Its performance is almost unbelievable, even to an old skeptic like me. I wish to congratulate you on an engineering triumph."*

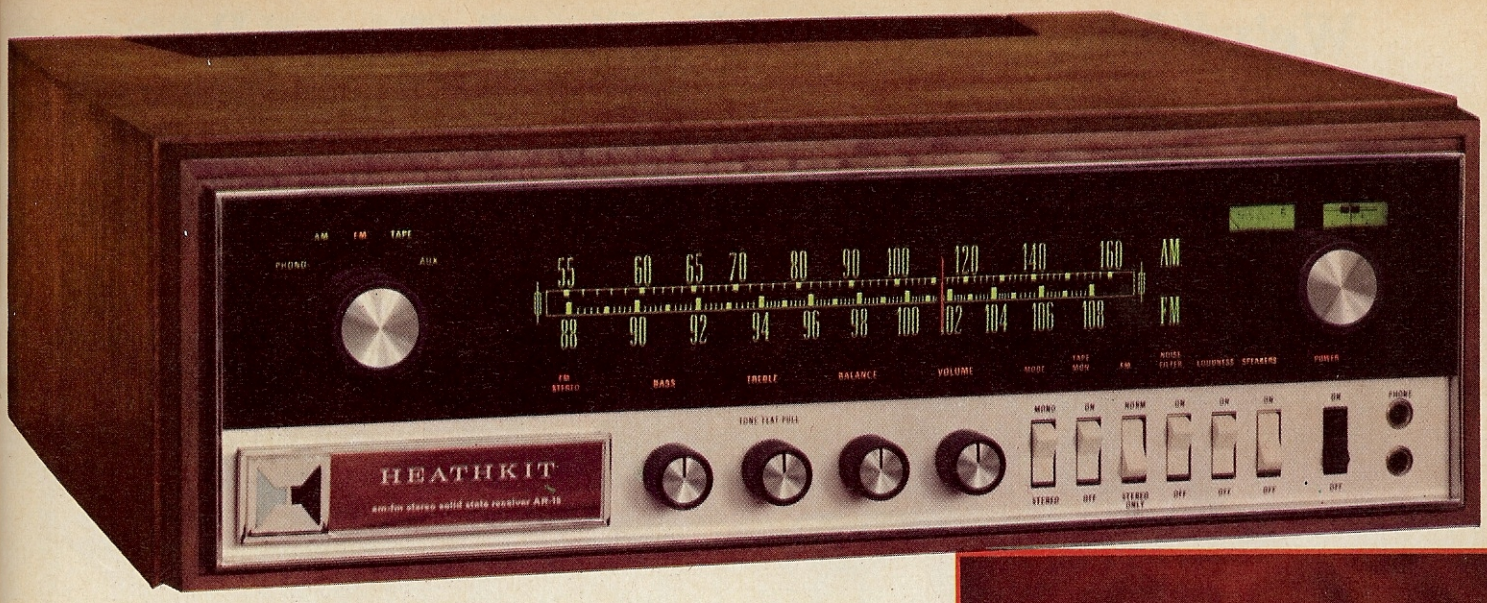
Kit AR-15 (less cabinet), 34 lbs. . . $34 dn., as low as $20 mo. . . **$339.95**

Assembled ARW-15 (less cabinet), 34 lbs. . . $53 dn., as low as $31 mo. **$525.00**

Assembled AE-16, 10 lbs., optional walnut cabinet. **24.95**

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

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



Kit AR-15

$339.95

(less cabinet)
$34 dn.,
as low as
$20 mo.

Wired ARW-15

$525.00

(less cabinet)
$53 dn.,
as low as
$31 mo.

"Black Magic" Panel Lighting

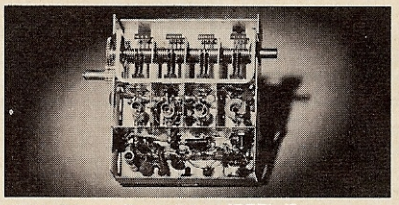
Even when not in use, the Heathkit AR-15 remains quietly unobtrusive . . . its rich midnight face unmarred by any dial or scale markings. And when you're ready for the ultimate in stereo listening, a simple touch of the power switch brings the AR-15 to life—the "Black Magic" panel lights up with an extended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



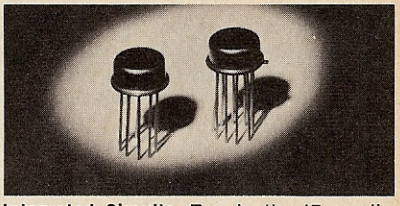
AR-15 SPECIFICATIONS—AMPLIFIER SECTION: Dynamic Power Output Per Channel (Music Power Rating): 8 ohm load; 75 watts. **Continuous Power Output, Per Channel*:** 8 ohm load; 50 watts. **Power Bandwidth For Constant 0.5% Total Harmonic Distortion*:** 6 Hz to 30 kHz. **Frequency Response (1 watt level):** ±1 dB, 8 Hz to 40 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 4.5 v). **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 (Stereophonic): 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, 16⅞" wide x 4¾" high x 14½" deep.

*Rated IHF (Institute of High Fidelity) Standards.

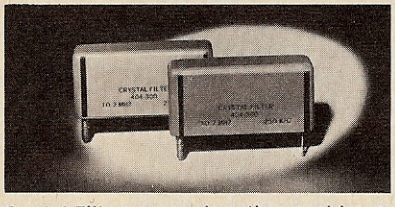
**RIAA (Record Industry Association of America).



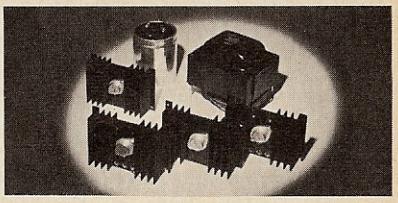
Field Effect Transistor (FET) Tuner . . . completely assembled & shielded. A cascode 2-stage FET RF amplifier and an FET mixer provide high overload capability, excellent cross modulation and image rejection.



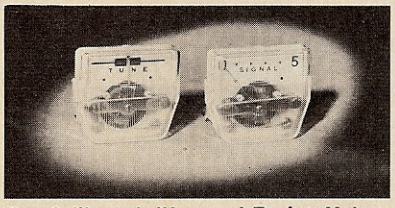
Integrated Circuits. Two in the IF amplifier for hard limiting, temperature stability and reliability. Each is only the size of a tiny transistor, yet contains 28 actual parts . . . 10 transistors, 11 resistors and 7 diodes.



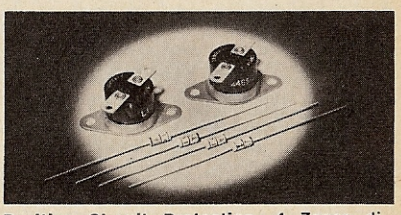
Crystal Filters . . . replace the usual transformers in the IF amplifier, providing an ideally shaped IF bandpass which offers adjacent channel selectivity not possible with conventional IF transformers.



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



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



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

Heathkit Performance Specifications Are Guaranteed

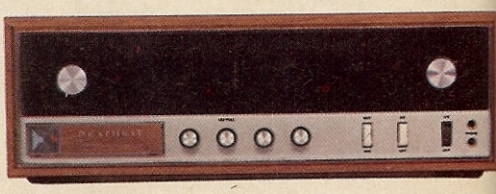
We've Made The World's Finest Stereo Receiver



AJ-15

$189.95 no money dn., $19 mo. **(less cabinet)**

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



New Deluxe Heathkit AJ-15 Stereo Tuner . . . The Superb FM Solid-State Stereo Tuner Section Of The Famous Heath AR-15 Receiver

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Kit AJ-15 (less cabinet), 18 lbs. . . no money dn., $19 mo. **$189.95**
Assembled AE-18, 8 lbs. optional walnut cabinet **$19.95**

AJ-15 SPECIFICATIONS—Tuner Section: Tuning range: 88 to 108 MHz. **Intermediate Frequency (IF):** 10.7 MHz. **Frequency Response:** ±1 dB, 20 to 15 kHz. **Antenna:** 75 ohm unbalanced or 300 ohm balanced external antennas. **Sensitivity:** 1.8 uV*. **Volume Sensitivity:** Below measurable level. **Selectivity:** 70 dB.* **Image Rejection:** 90 dB*. **IF Rejection:** 90 dB*. **Capture Ratio:** 1.5 dB*. **AM Suppression:** 50 dB*. **Harmonic Distortion:** 0.5% or less*. **Intermodulation:** 0.5% or less*. **Hum & Noise:** 70 dB*. **Spurious Rejection:** 100 dB*. **Stereophonic Section: Channel Separation:** 40 dB or greater at midfrequencies. 30 dB at 50 Hz. 25 dB at 10 kHz. 20 dB at 15 kHz. **Frequency Response:** ±1 dB from 20 to 15 kHz. **Harmonic Distortion:** 1% at 1000 Hz with 100% modulation. **19 kHz and 38 kHz Suppression:** 55 dB or greater. **SCA Suppression:** 50 dB. **Audio Section: Output Voltage: Tape and Fixed:** 1.5 Volts rms nominal with 100% modulation). **Phono and Variable:** 0 to 4 Volts rms before clipping (with 100% modulation). **Output Impedance: Tape and Fixed:** Approximately 9000 ohm. **Phono and Variable:** 100 ohm. **General: AC Outlet Socket:** Unswitched; 350 watts maximum. **Power Requirements:** 105-125 or 210-250 volts 50/60 Hz AC 0.25 watts. **Dimensions:** Overall: 16⅞" wide x 4¾" high x 12½" deep. **Mounting:** AE-18 accessory cabinet or custom mounting. **Net Weight:** 11½ lbs.
*Rated IHF (Institute of High Fidelity) Standards.

Save 5% On Your Heathkit Stereo/Hi-Fi System—Order Any Program Source, Amplifier, And Speaker; Deduct 5%

Into The World's Finest Stereo "Separates"



AA-15

$169.95 no money dn., $16 mo. (less cabinet)

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

FOR THE MAN WHO ALREADY OWNS A GOOD STEREO TUNER, here is the sophisticated stereo amplifier section of the famous Heath AR-15 Receiver as a separate component. With a heritage experts termed "an audio Rolls Royce", this new AA-15 Stereo Amplifier has the same deluxe circuitry and extra performance features as the AR-15 plus two important added features . . . a tuner input jack and a Remote Speaker Switch for control of a second, remotely located stereo speaker system.

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

INDIVIDUAL INPUT LEVEL CONTROLS . . . hidden behind a front panel access door. These controls allow you to adjust the input level for each channel of Phono, Tape, Tuner, Tape Monitor and Auxiliary inputs. Gone are the days of having to wade through a sea of connecting cables to find the correct level control—they're right there at your fingertips where you need them, when you need them.

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

LOW HARMONIC DISTORTION . . . less than 0.5% from 20 Hz to 20 kHz at 50 watts continuous output.

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

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

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

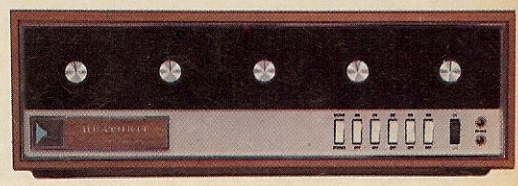
STEREO HEADPHONE JACKS . . . not one, but two. Tired of fumbling in the back of the amp or the side of the tape recorder for the headphone jacks? With the AA-15 both jacks are mounted right on the front panel—just plug in and listen.

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

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

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

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



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

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

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

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

Kit AA-15 (less cabinet), 28 lbs. . . . no money dn., $16 mo. **$169.95**
Assembled AE-18, 8 lbs., optional walnut cabinet. **$19.95**

AA-15 SPECIFICATIONS—Amplifier Section:—Note: The following specifications are typical for both Amplifier channels. Specifications were measured under the following conditions: identical signals fed to both channels simultaneously with left channel and right channel amplifiers both operating at equal power output into individual resistive loads, and with line voltage constant at 120 volts AC. **Dynamic Power Output Per Channel (Music Power Rating):** 8 ohm load—75 watts.* 4 ohm load—50 watts; 16 ohm load—45 watts. **Continuous Power Output Per Channel:** 8 ohm load—50 watts.* 4 ohm load—45 watts; 16 ohm load—35 watts. **Power Bandwidth For Constant .5% Total Harmonic Distortion:*** Less than 6 Hz to 30 kHz.* **Frequency Response (1 WATT LEVEL):** ±1 dB 8 Hz to 40 kHz; ±3 dB 4 Hz to 80 kHz. **Harmonic Distortion:** Less than .5% from 20 Hz to 20 kHz @ 50 watts output; less than .2% @ 1000 Hz with 10 watts output; less than .2% @ 1000 Hz with 1 watt output. **Intermodulation Distortion:** Less than .5% with 50 watts output, using 60 and 6000 Hz mixed 4:1; less than .2% with 1 watt output. **Damping Factor:** 45 or higher. **Input Sensitivity:** Phono: 2.2 millivolts (overload 155 mV); Tape: 200 millivolts (overload 4.5 V); Aux; 200 millivolts (overload 4.5 V); Tape Mon: 200 millivolts (overload 4.5 V). Note: Input sensitivity is the rms input voltage needed to obtain 50 watts of output power per channel into 8 ohm loads. **Hum and Noise:** Phono (10 millivolt reference): —60 dB; Tape and AUX (200 millivolt reference): —65 dB; Volume control in minimum position: —80 dB below rated output. **Channel Separation:** Phono: 45 dB or better; Tape and AUX: 55 dB or better. **Output Impedance (each channel):** 4 ohm through 16 ohm. **Tape Output Impedance:** 120 ohm. **Input Impedance:** Phono: 51 k ohm (** RIAA Equalized). AUX, Tape, and Tape MON: 100 k ohm. **Tape Output:** .17 volt output with .2 volt input. **Front Panel: Bass Control:** Dual tandem for simultaneous adjustment of both channels. Clockwise rotation from center provides 15 dB boost at 20 Hz. Counterclockwise rotation from center provides 17 dB cut at 20 Hz. **Treble Control:** Dual tandem for simultaneous adjustment of both channels. Clockwise rotation from center provides 15 dB boost at 20 kHz. Counterclockwise rotation from center provides 15 dB cut at 20 kHz. **General: AC Outlet Sockets:** Three, located on rear chassis apron for powering accessory equipment. One Switched (350 watts maximum) and two Unswitched (350 watts maximum). **Power Requirements:** 105-125 or 210-250 volts 50/60 Hz AC. 55 watts idling (zero output) and 240 watts at full output, with no load on accessory outlets. **Dimensions:** Overall—16⅞" W x 4¾" H x 12½" D. **Mounting:** AE-18 Cabinet or custom mounting. *Rated IHF (Institute of High Fidelity) Standards. **RIAA (Recording Industry Association of America).

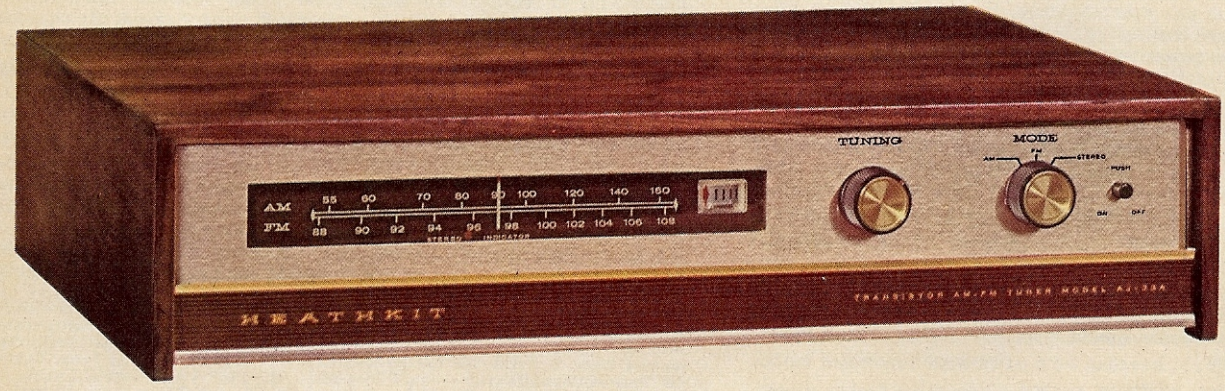
Open Your Heath Account—No Money Down—Up To 18 Months To Pay—See Order Blank For Details

STEREO HI-FI

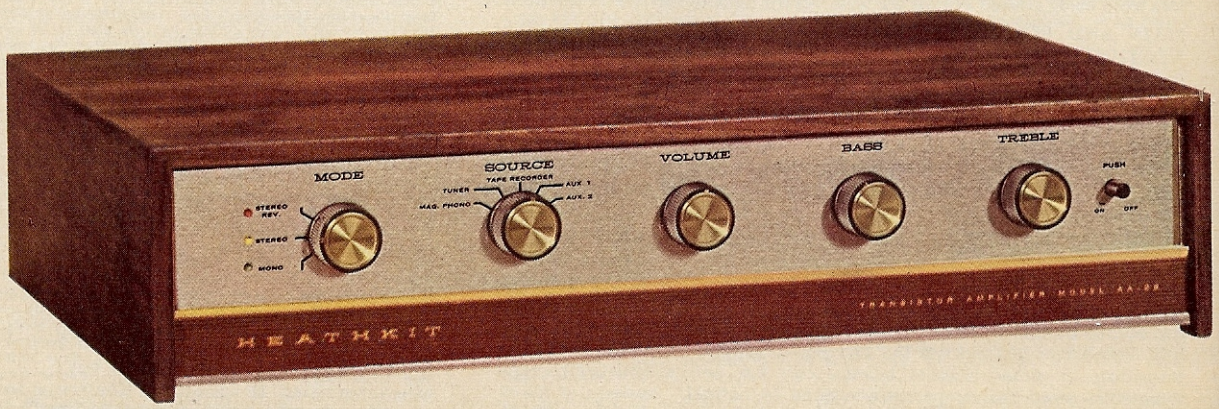
Solid-State Stereo . . . Praise



AR-13A
$189.95



AJ-33A
$99.95



AA-22
$99.95

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

Winning Performance At Money Saving Prices

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. 50 & 51 for details.

Kit AR-13A, 35 lbs. . . no money dn., $18 mo. **$189.95**

AR-13A SPECIFICATIONS—Recommended system mates: Speaker systems: AS-153, AS-163, AS-173, AS-183, pg. 67; AS-16, AS-10 or AS-37, pg. 66. All changers, ppg. 62, 63, 64. **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, 6MV; Aux. 1, .25v; Aux. 2, 25 v. **Input impedance:** Mag. phono, 35 K ohm; Aux. 1, 100 K ohm; Aux. 2, 100 K ohm. **Output:** 4, 8 & 16 ohm and low impedance tape recorder outputs. **Controls:** 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 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 or 210-250 volts, 50-60 Hz AC, 30 watts idling, 110 watts max.

All-Transistor AM/FM Stereo Tuner . . . Sleek Silhouette, 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:** 15⅝" W x 3¾" H x 11½" D.

Matching 66-Watt Transistor Stereo Amplifier

• 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**

AA-22 SPECIFICATIONS—Recommended system mates: Speakers: AS-16, AS-10 & AS-37, pg. 66; AS-183, AS-173, AS-163, AS-153 & AS-133, pg. 67; all changers and turntables, ppg. 62, 63, 64. **Simultaneous power output per channel:** (Heath Rating). 20 watts/8 ohm load, 13 watts/16 ohm load, 9 watts/4 ohm load. (IHFM 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% at 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 kHz. **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. **Semiconductor complement:** 20 transistors, 10 diodes. **Power requirements:** 105-125 or 210-250 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:** 15⅝" W x 3¾" H x 11⅜" D.

Heathkit Performance Specifications Are Guaranteed

Plan Your Own Custom Stereo System

This is a guide to the best HI-FI combinations—matched in performance and style. One of them will satisfy your needs and fit into your budget.

HOW TO DESIGN A MUSIC SYSTEM: Start by choosing the receiver or the "tuner and amplifier set", then select one turntable among those suggested. All you have to do now is to decide which speaker systems or speakers you require (order two identical for stereo) . . . and you've Custom Tailored your sound system.

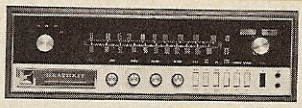
Choose Your Turntable — **Tuners And Amplifiers** — **Choose Your Speaker System**

TOP OF THE LINE STEREO

(See pg. 62-65)



ADP-47
ADP-57

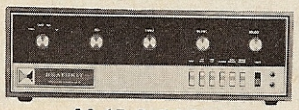


AR-15 Solid-State AM/FM/FM Stereo Receiver

or



FM/FM Stereo Tuner
AJ-15 Solid-State



AA-15 Solid-State Amplifier

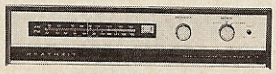
or

ADP-55
ADP-18

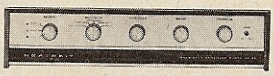


AR-13A AM/FM Stereo Receiver

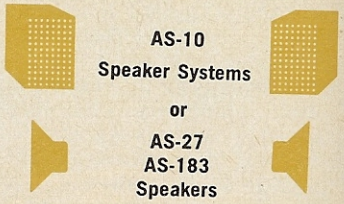
or



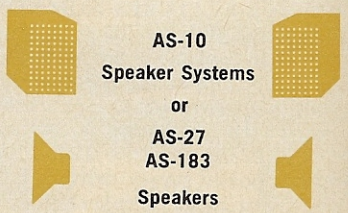
AJ-33A AM/FM Stereo Tuner



AA-22 Amplifier



AS-10
Speaker Systems
or
AS-27
AS-183
Speakers



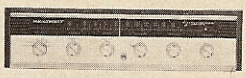
AS-10
Speaker Systems
or
AS-27
AS-183
Speakers

MEDIUM PRICED STEREO

ADP-67
ADP-77
ADP-48

ADP-28
ADP-38

AR-14

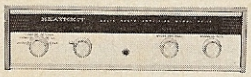


M Stereo Receiver

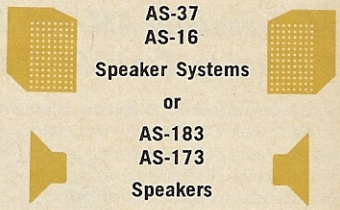
or



AJ-14 FM/FM Stereo Tuner



AA-14 Amplifier

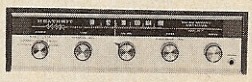


AS-37
AS-16
Speaker Systems
or
AS-183
AS-173
Speakers

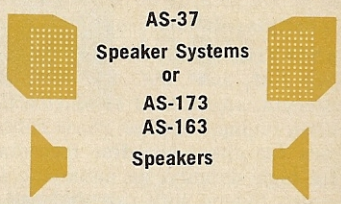
LOW COST STEREO

ADP-46
ADP-77

ADP-38
GD-187



AR-17 FM Stereo Receiver

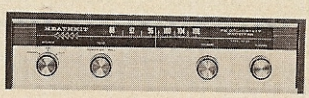


AS-37
Speaker Systems
or
AS-173
AS-163
Speakers

MONO SYSTEMS

ADP-46
GD-187

AR-27

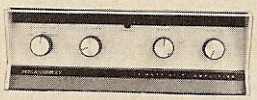


FM Receiver

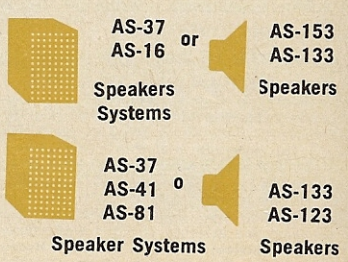
or



AJ-63 FM Tuner



AA-13 Medium Power Amp



AS-37
AS-16
or
AS-153
AS-133
Speakers
Systems
Speakers

AS-37
AS-41
or
AS-81
AS-133
AS-123
Speaker Systems
Speakers

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

Save 5% On Your Heathkit Stereo/Hi-Fi System—Order Any Program Source, Amplifier, And Speaker; Deduct 5%

Save 5% By Ordering A System

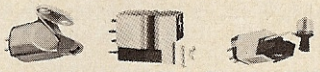
Recommended Stereo Systems

Versatile Mid-Priced Stereo System



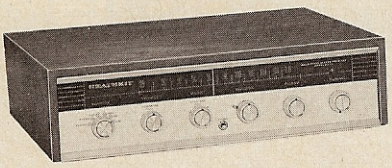
ADP-46 Garrard MK II Stereo Record Changer with choice of 1c cartridge, below, **$44.51** plus **ADA-77-1** base, pg. 62. . . . **$5.95**

1c Cartridge Offer!
limit one per turntable order



Empire 888 Reg. $24.95 | **Shure M75-6** Reg. $24.50 | **Pickering V15AC-3** Reg. $24.95

Specify Heath Model No.—See pg. 65



Heathkit AR-14, 30-Watt FM Stereo Receiver, page 52 . . . **$114.95** plus matching **AE-55** walnut cabinet **$12.95**



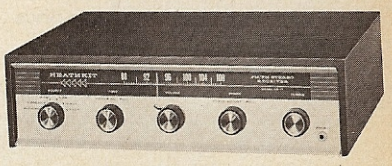
Heathkit AS-37 2-Way Speaker System, pg. 66 . . . . . **$39.95** each

Complete System Kit HFS-90
Reg. **$258.26**
Save 5% **$12.91**
You Pay Only **$245.35**

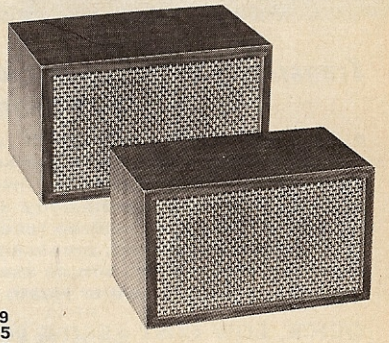
Save On This Low-Cost Stereo System!



GD-187 Maestro 4-speed Stereo Record Changer with Diamond stylus, pg. 65 . . . . . **$29.95**



Heathkit AR-17 FM Stereo Receiver, page 54 . . . . . **$69.95** plus matching **AE-25** walnut cabinet. . **$9.95**



Heathkit AS-81W Miniature Hi-Fi 2-Way Speaker Systems with walnut cabinets, pg. 66, **$19.95** each

Complete System Kit HFS-89
Reg. **$149.75**
Save 5% **$7.48**
You Pay Only **$142.27**

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. 55, and connect to speakers that are only capable of reproducing 10 watts per channel. Just remember that a music stystem 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 or record player), amplifier, and speaker or speaker system—and deduct 5% from the total cost provided that the complete system is ordered at one time. The only Heathkit audio components *not* eligible for discount are the AR-15 stereo receiver and the AD-27 compact system.

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 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.

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

Go Solid-State Stereo For Less Than You'd Expect

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 3⅞" H x 15¼" W x 12" D • Custom install it in wall, your own cabinet, or either Heath cabinet • Build it in 20 hours

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

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

ADVANCED TRANSFORMERLESS OUTPUT CIRCUIT . . . provides "pure" sound, uncolored by reactive circuits. Each channel uses two output transistors—a complementary PNP and NPN pair. This design has proven superior in lower phase shift and distortion and wider response. A 6-position source switch selects tuner, tape, or records, stereo or mono; dual concentric volume control for separate adjustment of each channel; a tandem treble control with push-pull power switch and tandem bass control with push-pull speaker on-off switch when listening with headphones. There's also a front panel stereo headphone jack for private listening; automatic stereo indicator light; and filtered outputs for beat-free stereo taping.

BOOKSHELF SIZE . . . 3-WAY INSTALLATION. Measures only 3⅞" H x 15¼" 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 EXRA 5% . . . order with speakers plus any turntable, and take the special Heath 5% stereo system discount from the total. See ppg. 50 & 51 for details.

Kit AR-14, 18 lbs., less cabinet for custom mounting . . .
no money down, $11 mo. **$114.95**
Model AE-55, 6 lbs., walnut veneer cabinet. **$12.95**
Model AE-65, 6 lbs., beige steel cabinet. **$3.95**

AR-14 SPECIFICATIONS—Recommended system mates: All speakers & speaker systems, ppg. 66 & 67 except AS-10; all changers & turntables, ppg. 62 to 64. **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 15¼" W x 3⅞" H x 12" D. **Mounting position:** Horizontal or Vertical; Cutout required 15" x 3½"; Depth required from front of mounting surface 11½". **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 (IF):** —45 db. **Capture ratio (IF):** 3 db. **AFC correction:** 150 kHz per volt. **AM suppression (IHF):** —35 db. **(IF):** 10.7 MHz. **Hum & noise:** —50 db, 1 watt reference.

Transistor FM Stereo Tuner . . . Concert Hall Sound At An Amazing Price

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

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 . . . 11¾" W. x 2⅞" H. x 9¾" 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. **$54.95**
Model AE-35, 4 lbs., beige metal cabinet. **$3.50**
Model AE-25, 4 lbs., genuine walnut veneer cabinet. **$9.95**
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 12½" W x 3½" H x 9⅝" D. **Custom mounting dimensions:** Horizontal or vertical, cutout required 11¾" x 2⅞", depth required from front of mounting surface 9¾".

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

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

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.

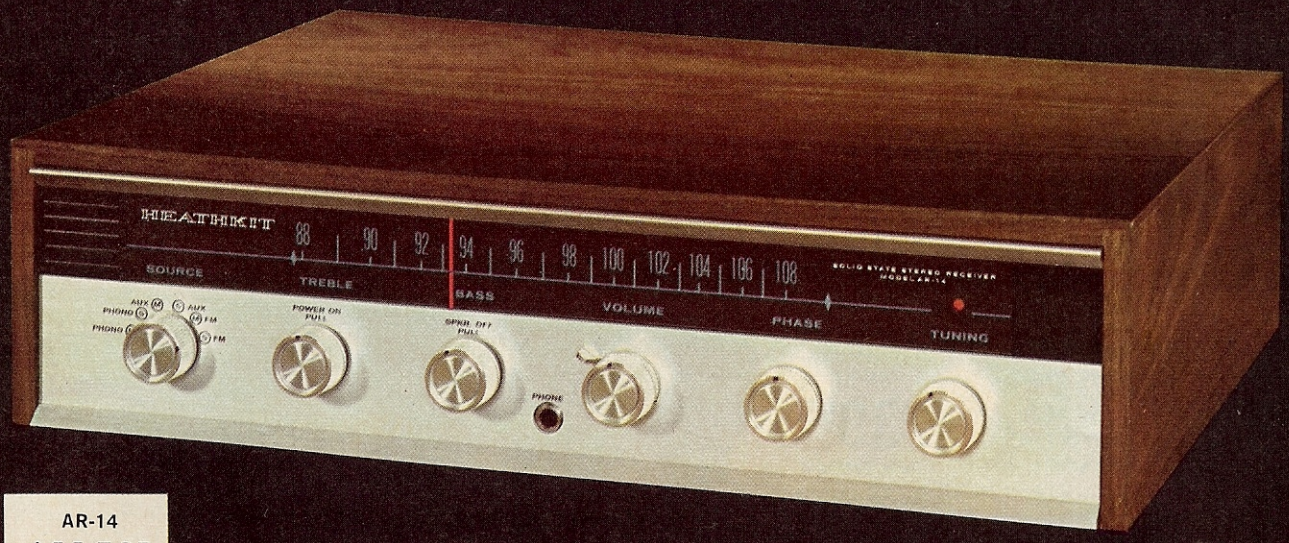
COMPLETE OPERATING CONVENIENCE. A 6-position source switch handles your records, tuner or tapes . . . stereo or mono. For independent adjustment of each channel there's a clutched volume control. And there are full-range tandem controls for bass and treble boost and cut; edge-lighted dial; and a front 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 9¾" D. x 2⅞" H. x 11¾" 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. **$64.95**
Model AE-35, 4 lbs., beige metal cabinet. **$3.50**
Model AE-25, 4 lbs., genuine walnut veneer cabinet **$9.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AA-14 SPECIFICATIONS—Recommended system mates: All speakers & speaker systems, ppg. 66 & 67, except AS-10U, all changers & turntables ppg. 62, 63 & 64. **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 12½" W x 3½" H x 9⅝" D. **Custom mounting dimensions:** Horizontal or vertical; cutout required 11¾" x 2⅞", depth required from front of mounting surface 10¾".

Save 5% On Your Heathkit Stereo/Hi-Fi System—Order Any Program Source, Amplifier, And Speaker; Deduct 5%



AR-14
$114.95
(less cabinet)



AJ-14
$54.95
(less cabinet)

AA-14
$64.95
(less cabinet)

Low Cost Solid-State Receivers



AR-17
$69.95
(less cabinet)
no money dn., $7 mo.



AR-27
$39.95
(less cabinet)
no money dn., $5 mo.

You Can Own A Heathkit AR-17 All-Transistor FM Stereo Receiver With State-Of-The-Art Features For Less Than You Think . . . Lots Less

• 28 transistor, 7 diode circuit for natural transparent sound, instant operation, long trouble-free life • 14 watts music power, 10 watts RMS from 25-35,000 Hz @ ± 1 db • Automatic stereo indicator light • Adjustable phase control for maximum separation • Complete front panel controls • Flywheel tuning • All critical circuits including FM "front-end" factory assembled & aligned • Circuit board assembly • Compact 10⅜" 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 10⅜" 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., $7 mo. **$69.95**
Model AE-35, 4 lbs., beige metal cabinet **$3.50**
Model AE-25, 4 lbs., genuine walnut veneer cabinet **$9.95**

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 10⅜" D. **Mounting position:** Horizontal or vertical. **Custom mounting requirements:** 11¾" x 2⅞" cutout, 10" D. from front mounting surface. **Net weight:** 9 lbs.
*Rated IHF (Institute of High Fidelity) Standards.

High Quality Reception At A Most Unassuming Price . . . The Heathkit AR-27 FM Monophonic Receiver

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

You Can't Buy A Finer 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 10⅜" D. x 3" H. x 12" W. . . . for installation versatility.

You can install it in a wall, your own custom cabinet, or either preassembled 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. **$39.95**
Model AE-35, 4 lbs., beige metal cabinet **$3.50**
Model AE-25, 4 lbs., genuine walnut veneer cabinet **$9.95**

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*. **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 10⅜" D. **Mounting position:** Horizontal or vertical. **Custom mounting requirements:** 11¾" x 2⅞" cutout, 10" deep from front mounting surface.
*Rated IHF (Institute of High Fidelity) Standards.

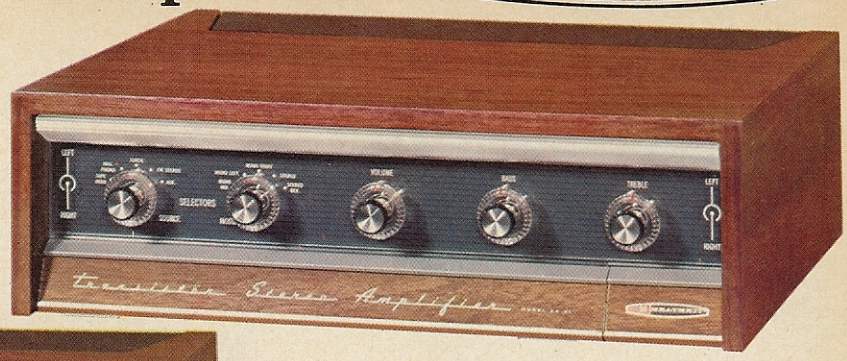
Matched Solid-State Separates

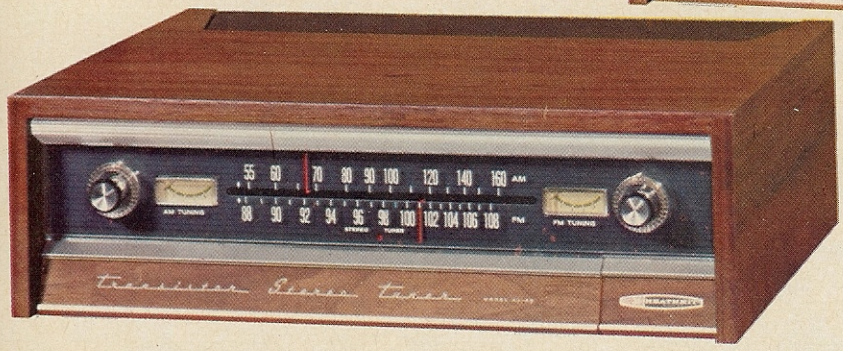
HEATHKIT®

AJ-43D

$114.95

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





AA-21D

$139.95

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

Deluxe Solid-State AM/FM/FM Stereo Tuner . . . Pre-built, Pre-aligned "Front End" & IF . . . Low Distortion, Hyper-Sensitive Reception

• 25-transistor, 9-diode circuit for pure, natural "transistor sound," heat-free operation • AM/FM/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 **$14.95**

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 ± ¼ 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:** 15½" W x 5¼" H x 14¼" D.

Matching 100 Watt Solid-State Stereo Amplifier . . . Transistorized Circuitry Delivers What You Need When You Need It

• 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.

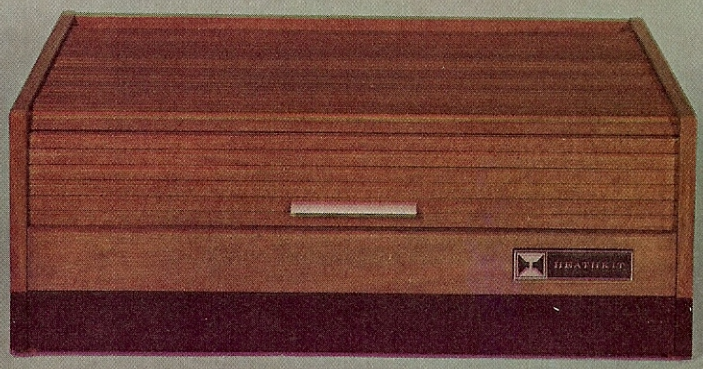
Kit AA-21D, 23 lbs. . . less cabinet for custom mounting. . .
no money down, $13 mo. **$139.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.
Model AE-11, 8 lbs. . . walnut wood cabinet. **$14.95**

AA-21D SPECIFICATIONS—RECOMMENDED SYSTEM MATES: Separate Speaker, AS-183 pg. 67. Speaker Systems, AS-16 & AS-10, AS-37, pg. 66. All changers & turntables, ppg. 62, 63 & 64. **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:** 15½" W x 5¼" H x 14" D.

Introducing The Finest Stereo Compact You Can Buy...

AD-27

$169.95



Smart oiled walnut cabinet with disappearing tambour door

Heathkit® "27" Solid-State FM Stereo Compact

This Performance-Packed Compact Has Features Not Found In Other Units Costing Twice Its Price—30 Watts Music Power—Sensitive FM Stereo—High Quality Cartridge & Changer—And Smart Good Looks!

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

DESIGNED FOR THOSE WITH LIMITED SPACE, LIMITED BUDGETS AND A DESIRE FOR THE FINEST IN A HOME MUSIC SYSTEM. The AD-27 fits these requirements perfectly. First, it's mini-sized. Measures only 21⅞" W. x 14-11/16" D. x 7⅞" H. Fits just about anywhere—on a bookcase shelf, on a desk top. And its classic ebony and walnut styling let it blend with any room decor. Mini-priced too—won't knock your budget into next year.

WHAT REALLY COUNTS IS THE PERFORMANCE THE AD-27 DELIVERS. Underneath the beautiful exterior of the AD-27 Stereo Compact is a really performance-plus package. A comparable system could easily cost twice as much and still not have all the features of the AD-27. Features like an amplifier that delivers an honest 15 watts of music power per channel with a response curve that is virtually flat from 12 Hz to 60 kHz. An astounding 45 dB channel separation . . . harmonic distortion that's less than 1% and IM distortion less than 0.5%—both measured at full output! All solid state circuitry for heat-free, trouble-free performance, rugged reliability and easier construction. Advanced transformerless output circuitry that provides lower phase shift and distortion, and an added feature: protection against severe transistor damage from shorted output leads—another indication of the extra value Heath engineers have designed into the AD-27 Stereo Compact.

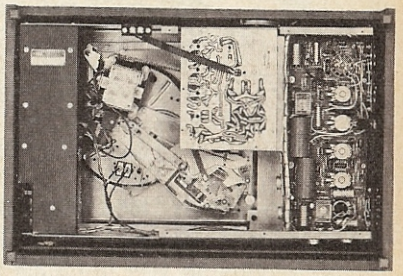
COOL, CRISP SOLID-STATE SOUND. That's what you get from this one. The 31 transistor, 10 diode circuit is ready to go the instant you flick the rocker-type power switch. Select the FM Stereo mode and tune effortlessly across the dial, thanks to the inertia flywheel tuning. The FM Tuner may be small in size, but it outperforms some of the best around. You'll hear stations you didn't know were on the air, and marvel at the clarity and separation of the sound. The adjustable phase control insures proper phasing at all times—no more poor stereo separation. And the Automatic Frequency Control puts an end to drift. Wonder if that program is in stereo? No more guesswork—the stereo indicator lights up automatically every time you tune in a stereo broadcast. Filtered tape outputs provide beat-free taping too. And the electronically filtered power supply provides reliable, low noise, ripple free power to the tuner and amplifier.

THE BSR McDONALD "500" TURNTABLE HAS FEATURES FOUND ONLY IN MORE EXPENSIVE UNITS . . . Like a low mass tubular aluminum tone arm that's counterbalanced both vertically and horizontally for optimum tracking . . . a continuously variable dynamic anti-skate control that neutralizes the inward skating force and eliminates the distortion caused by unequal side-wall pressure on the stylus. A cueing and pause control that lets you select the exact band on the record without fear of cartridge or record damage. The full-size turntable platter gives ideal record support and the scientifically designed spring suspension minimizes the external shock susceptibility that is common to turntables with counterbalanced arms. And the Shure magnetic cartridge has a .0007" diamond stylus and 20 to 20,000 Hz response. Automatic system power too—turn the receiver to "off", load the records and start the turntable—the amplifier automatically turns "on". And when the last record is finished, the system shuts itself off. Just one more example of the "performance-plus" engineering that goes into this Heathkit Stereo Compact.

JUST SELECT THE SPEAKERS AND YOU HAVE A BOX SEAT FOR THE CONCERT—RIGHT IN YOUR LIVING ROOM. Many stereo compacts don't provide the buyer with the power and output impedances necessary to fulfill individual tastes and room requirements in speakers. But with the AD-27 you choose the speakers—to fit your needs—to fit your budget. The speaker outputs will accommodate speakers with an impedance from 4 to 16 ohms, and power output is sufficient to drive even low efficiency speakers—but the final choice is up to you.

EASY TO ASSEMBLE. Most of the components mount on three circuit boards, and two cable assemblies simplify wiring. Much of the tedious point-to-point wiring of controls and components has been eliminated by mounting them right on the circuits boards. The front end is pre-assembled and pre-aligned and all the tuning coils are pre-set, requiring only a touch-up after final assembly. The famous Heathkit manual takes you every step of the way, from parts to programs in just a few pleasant evenings. Check the specifications—we think you'll agree that the AD-27 is the value and performance leader in the stereo compact field.

Kit AD-27, 41 lbs., no money dn., $16 mo. **$169.95**

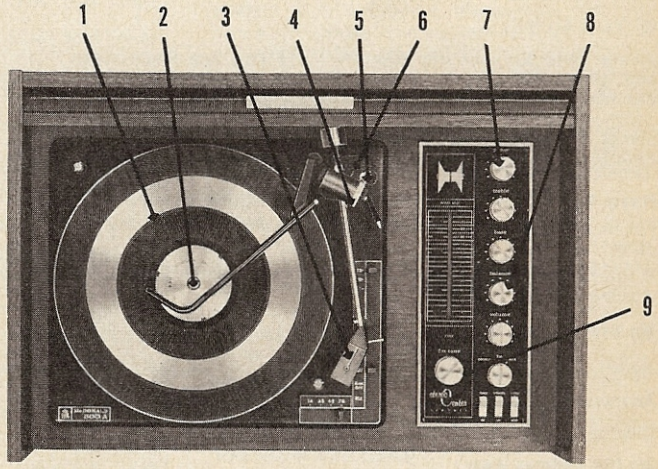


Note the clean, uncluttered component layout and the minimum of point-to-point wiring, thanks to the circuit boards. The power supply is on the left, the FM/FM stereo circuit board is in the center and the amplifier circuit board on the right.

AD-27 SPECIFICATIONS—FM SECTION: Tuning range: 88-108 MHz. **Antenna input impedance:** 300 ohms, balanced input. **Sensitivity:** 5 uv.* **Intermediate frequency (IF):** 10.7 MHz. **Hum & noise:** —45 dB, 1 watt reference. **Audio frequency response:** Mono: 0 to —3 dB from 20 to 15,000 Hz. **Harmonic distortion:** 1% or less.* **Image rejection:** —45 dB.* **Capture ratio:** 4 dB.* **AFC Correction:** 150 kHz per volt. **AM Suppression:** —35 dB.* **IF Rejection:** —80 dB.* **Separation:** 27 dB @ 1000 Hz. **AMPLIFIER SECTION: Continuous power output:** 10 watts per channel. **Music power output:** 15 watts per channel.* **Tape output:** 0.5 volt, with a 0.3 volt signal at the AUX input. **Speaker output impedance:** 4 thru 16 ohms. **Tape output impedance:** 3500 ohms. **Damping factor:** 50 or higher. **Hum & noise: Phono** (10 mV reference): —60 dB without phono cartridge: —47 dB with phono cartridge connected. Auxiliary: —60 dB. **Frequency response** (1 watt): 12 Hz to 60 kHz ±1 dB, 6 Hz to 100 kHz ±3 dB. **Power bandwidth:** 5 Hz to 90 kHz. **Input sensitivity:** Phono, 47 k ohms; Aux., 180 k ohms. **Channel separation:** 45 dB or better at 1000 Hz. **Total harmonic distortion (at full output):** Less than 1% from 12 Hz to 60 kHz. **Intermodulation distortion (at full output):** Less than 0.5% using 60 & 6000 Hz mixed 4:1. **Phono equalization:** RIAA (Recording Industry Assoc. of America). **Bass:** —16 dB cut & 15 dB boost @ 20 Hz. **Treble:** —13 dB cut & 15 dB boost @ 20,000 Hz. **AUTOMATIC TURNTABLE: Type:** BSR (Better Sound Reproduction) McDonald 500A. **Turntable speed:** 16⅔, 33⅓, 45, & 78 rpm (within +3 rpm and —½ rpm of indicated speed after 2-minute warmup). **Record size:** 7", 10", or 12". **Wow:** Less than 0.2% **Flutter:** Less than 0.06%. **Cartridge type:** Shure model M44-7. **Stylus:** .0007" radius diamond. **Tracking pressure:** 1.5 to 3 grams. **Frequency response cartridge:** 20 to 20,000 Hz. **Channel separation cartridge:** 25 dB @ 1,000 Hz. **GENERAL: Power requirements:** 105-125 or 210-250 volts. 50/60 Hz, 32 watts idling, 65 watts full output. Plus 7.5 watts from automatic turntable motor. **Dimensions:** Overall, 21⅞" W x 7⅞" H x 14-11/16" D. **Net weight:** 29 lbs.

*Rated IHF (Institute of High Fidelity) Standards

RECOMMENDED SPEAKER SYSTEMS AS-37, AS-16, and AS-10, page 66.



1. Dynamically balanced, resiliency-mounted 4-pole induction motor for low wow and flutter. **2.** Removable center spindles for automatic or manual play. **3.** Counterbalanced low mass aluminum tone arm with high quality Shure diamond stylus cartridge. **4.** Micrometer stylus pressure adjustment 0-6 grams in ⅓ gram steps. **5.** Continuously variable anti-skate control. **6.** Cueing and pause control. **7.** Adjustable phase control for maximum separation & minimum distortion. **8.** Balance control to compensate for speaker placement and room acoustics. **9.** Inertia flywheel tuning for smoother station selection.

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

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 C.O.D. 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.

If You Are Receiving Duplicate Copies

of Heathkit catalogs, return the mailing labels of those copies you wish discontinued.

Have You Moved Since Your Last Heathkit Order?
Fill in and mail this coupon to Heath so we can bring your records up to date.

If you have an address label from a previous Heathkit flyer or catalog, send it along with the coupon.

My New Address Is:

Name_____

Address_____

City_____ State_____ Zip_____

My Old Address Was:

Name_____

Address_____

City_____ State_____ Zip_____

Be sure to include your zip code no.

EASY PAYMENT CHART

Unpaid Balance	Carrying Charge	Up to 12 Monthly Payments*	Unpaid Balance	Carrying Charge	Up to 12 Monthly Payments*
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
40.01-50	5.00	5.00	280.01-290	29.00	27.00
50.01-60	6.00	6.00	290.01-300	30.00	28.00
60.01-70	7.00	7.00	300.01-310	31.00	29.00
70.01-80	8.00	8.00	310.01-320	32.00	30.00
80.01-90	9.00	9.00	320.01-330	33.00	31.00
90.01-100	10.00	10.00	330.01-340	34.00	32.00
100.01-110	11.00	11.00	340.01-350	35.00	33.00
110.01-120	12.00	11.00	350.01-360	36.00	34.00
120.01-130	13.00	12.00	360.01-370	37.00	35.00
130.01-140	14.00	13.00	370.01-380	38.00	36.00
140.01-150	15.00	14.00	380.01-390	39.00	37.00
150.01-160	16.00	15.00	390.01-400	40.00	38.00
160.01-170	17.00	16.00	400.01-410	41.00	39.00
170.01-180	18.00	17.00	410.01-420	42.00	40.00
180.01-190	19.00	18.00	420.01-430	43.00	41.00
190.01-200	20.00	19.00	430.01-440	44.00	42.00
200.01-210	21.00	20.00	440.01-450	45.00	43.00
210.01-220	22.00	21.00	450.01-460	46.00	44.00
220.01-230	23.00	22.00	460.01-470	47.00	45.00
230.01-240	24.00	22.00	470.01-480	48.00	46.00
240.01-250	25.00	23.00	480.01-490	49.00	47.00
			490.01-500	50.00	48.00

*All monthly payments are for the amount shown; last payment is for the odd amount remaining due.

Up to 18 Months	
Carrying Charge	Monthly Payment*
$46.50	$20.00
48.00	21.00
49.50	22.00
51.00	22.00
52.50	23.00
54.00	23.00
55.50	24.00
57.00	25.00
58.50	25.00
60.00	26.00
61.50	27.00
63.00	28.00
64.50	29.00
66.00	29.00
67.50	30.00
69.00	30.00
70.50	31.00
72.00	31.00
73.50	32.00
75.00	32.00

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

Postal Regulations . . . limit parcel post shipments to 30 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.

APO And FPO Parcels Only . . . not over 30 lbs. and not over 60" length and girth combined can be sent Airlift for an additional $1 fee; just figure regular surface rates, add $1 for each 30 lbs. and mark "Airlift" on your order.

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.

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.

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 $50	.30
$50.01 to $100	.40
$100.01 to $150	.50
$150.01 to $200	.60

Liability for insured mail is limited to $200.

***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.

STEREO HI-FI

Budget-Saver "Tube-Type" Hi-Fi

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

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

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

AA-18 SPECIFICATIONS—Dynamic Power Output: 4 watts.* **Continuous power output:** 3.25 watts.* **Output impedance:** 4 to 16 ohms. **Input sensitivity:** 250 millivolts. **Input impedance:** 125K ohms. **Hum and Noise:** —65 dB. **Treble cut:** —22 dB at 15 kHz. **Power bandwidth for constant 1.5% total harmonic distortion:** 20 Hz to 100 kHz. **Harmonic distortion:** Less than 1.5% from 40 Hz to 60 kHz at 4 watts output. Less than 0.7% from 20 Hz to 60 kHz at 1 watt output. **Intermodulation distortion:** Less than 4% with 4 watts output using 60 Hz and 6 kHz mixed 4:1. **Damping factor:** 10 or better. **Power requirements:** 105-125 or 210-250 volts, 50/60 Hz, 5 watts maximum. **Cabinet size:** 7-11/16" W x 5-9/16" D x 2⅝" H. **Net weight:** 2 lb. 10 oz. *Rated IHF (Institute of High Fidelity) Standards.

Ⓑ *High Performance FM Stereo Tuner*

• 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 below

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.

Kit AJ-13, 14 lbs. . . no money dn., $5 mo. **$47.00**

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 on/off-FM-stereo; AFC off/on switch. **Dimensions: Overall:** 13½" W x 4¾" H x 9½" D.

Ⓒ *Matching 20-Watt Stereo Amplifier*

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

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.

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, AS-133 & AS-123, p. 67. Speaker Systems: AS-37 & AS-81, p. 66. Changers & turntables. pp. 62-64. **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 9¼" D.

Ⓓ *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

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 13¾" W x 5½" 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-10 & AS-37 p. 66; All turntables, pp. 62-64. **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.

Ⓕ *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 dimensions:** 4¾" H x 13⅜" W x 7" D.

Ⓖ *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 & AS-37, p. 66; AS-183, AS-173 & AS-163, p. 67; All changers and turntables. ppg. 62-64. **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.

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

. . . Choice Of Stereo Or Mono

HEATHKIT®



Save 5% On Your Heathkit Stereo/Hi-Fi System—Order Any Program Source, Amplifier, And Speaker; Deduct 5%

Garrard Synchro-Lab

Gyroscopic Gimbal Pivots for minimal tone arm friction.

Anti-Skating Control with patented sliding weight design.

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

Convenient Interchangeable Cartridge Clip eliminates need for plug-in shell.



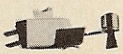


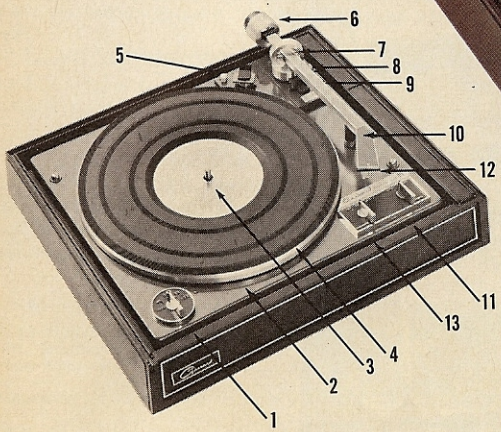
ADP-47

$129.50

(less cartridge & base)

NEW! Cartridge Options
Limit one per turntable order
Specify Heath Model No.—see p. 65

1¢	$5
 Shure M93E Reg. $39.95	 Shure M91E Reg. $49.95
 Pickering V15ATE-3 Reg. $39.95	 Pickering V15AME-3 Reg. $49.95
 Empire 888E Reg. $39.95	 Empire 888TE Reg. $49.95



1. Combined record size and speed selector 2. 12" turntable 3. Single play spindle 4. Anti-static mat 5. Retractable Record platform 6. Adjustable counter-weight 7. Stylus force adjustment 8. Automatic control lever functions 9. Combined manual & cueing controls.

ADP-47 SPECIFICAIONS—Speeds: 78, 45 & 33⅓ 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 14⅝" D x 4⅜" above, 3" below motor board.

Garrard SL-95 Automatic Transcription Turntable With Revolutionary Synchro-Lab Motor . . . Garrard's Finest

• Synchro-lab motor for precision turntable speed • 3-speed (78, 33⅓, & 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 gimballed pivots for minimal friction • Adjustable anti-skating control, calibrated in ½ grams, infinitely variable • Stylus force adjustment dial, detent stops at ¼ grams and visual markings in ½ 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 only, 14 lbs. . . no money dn., $12 mo. $129.50
ADA-47-3, Power-Matic base, 4 lbs. $15.95
ADA-47-1, Coordinated Base, simulated leather & ebony, 3 lbs. $5.95
ADA-47-4, dust cover, for use only with ADA-47-1, 1 lb. $5.95
ADA-57-2, Garrard LRS25 45 rpm spindle, 1 lb. $3.80

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

NEW! Cartridge Options
Limit one per turntable order
Specify Heath Model No.
—see p. 65

1¢	$5
Shure M31E Reg. $29.95	Shure M93E Reg. $39.95
Pickering V15ACE-3 Reg. $29.95	Pickering V15ATE-3 Reg. $39.95
Empire 808E Reg. $29.95	Empire 888E Reg. $39.95



ADP-67

$79.50

(less cartridge & base)

• 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 • Oversized, over-cast turntable • Interchangeable spindles • Lightweight, cutaway cartridge shell

ADP-67, turntable, 14 lbs. . . no money dn., $8 mo. $79.50
ADA-77-3, Power-Matic Base, 3 lbs. $14.95
ADA-77-1, Coordinated Base, simulated leather & ebony, 3 lbs. . . $4.95
ADA-77-4, dust cover, for use only with ADA-77-1, 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, 33⅓ & 16⅔ rpm, and **Dimensions:** 15⅜" W x 13⅛" D x 4¾" above, 2⅞" below motor board.

NEW! Garrard Module SLX Automatic Turntable . . . With Famous Synchro-Lab Motor



ADP-48

$69.50

Complete with cartridge & base

What Is A Module?

A module is a component part of a system. Now from Garrard comes the Module SLX—a superb new automatic turntable complete with a top name magnetic cartridge, all pre-assembled and mounted on a base—ready to play—ready to perform as a quality module of your stereo system.

• Nothing to assemble—comes complete with cartridge, dust cover & base installed . . . just unpack & connect • Synchro-Lab Motor • Low mass, dynamically balanced tone arm • Stylus pressure adjustable 0-5 grams • Cueing and Pause Control in both manual & automatic play • Correct stylus pressure preset • World famous, high compliance cartridge with diamond stylus • Convenient one-lever speed & record size selector • Adjustable sliding counterbalance weight

ADP-48, turntable, base, cartridge & cover, 15 lbs., no money dn., $7 mo. $69.50
ADA-66-2, Garrard LRS20 45 rpm spindle, 1 lb. $3.80

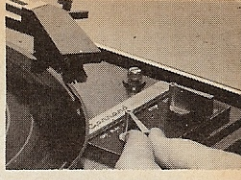
ADP-48 SPECIFICATIONS—Speeds: 78, 45 & 33⅓ rpm. **Motor:** Synchro-Lab. **Tracking:** Tracks per cartridge specifications. **Color:** Iridescent charcoal gray. **Wiring:** Stereo, 4 pin/5 wire system with separate ground connection for hum elimination. **Cables furnished:** Line cord, 2 audio cables. **Power requirements:** 100-130 VAC, 60 Hz. **Dimensions:** 15" W x 13¼" D x 7¾" H.

Heath Has The World's Largest Selection Of Electronic Kits—Over 300 To Choose From

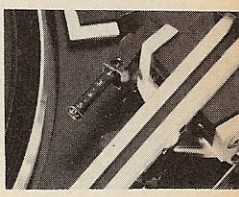
Turntables For 1969

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.

Garrard SYNCHRO LAB MOTOR



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

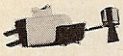


New Adjustable Anti-Skating Control. Simple, patented lever type, calibrated in ½ grams and infinitely variable.



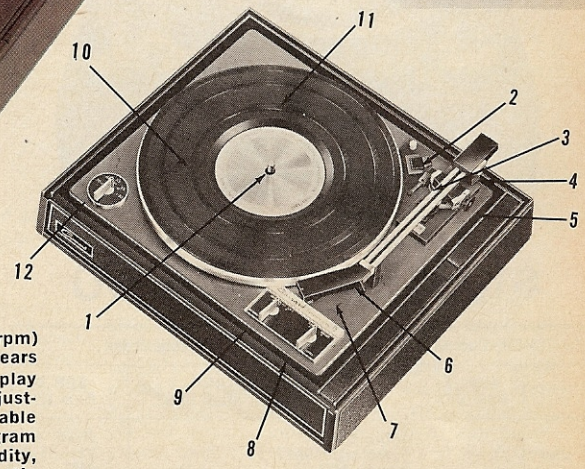
Optional Power-Matic base for Garrard Synchro-Lab turntables. Automatically turns off amplifier after last record.

NEW! Cartridge Options
Limit one per turntable order
Specify Heath Model No.—see p. 65

1¢	$5
 Shure M93E Reg. $39.95	 Shure M91E Reg. $49.95
 Pickering V15ATE-3 Reg. $39.95	 Pickering V15AME-3 Reg. $49.95
 Empire 888E Reg. $39.95	 Empire 888TE Reg. $49.95



ADP-57
$109.50
(less cartridge & base)



Garrard SL-75 3-Speed Automatic Stereo Transcription Turntable . . . With The Precision Speed Synchro-Lab Motor

• Revolutionary Synchro-Lab motor for precision turntable speed • 3 speed (33⅓, 45 & 78 rpm) automatic or manual play • Retractable record platform "pop-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 ½ grams, infinitely variable • Adjustable stylus force assembly, precision rotating "optical" knob marked 0 to 5 grams in ¼ 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, 14 lbs. . . no money dn., $11 mo. **$109.50**
ADA-47-3, Power-Matic, 3 lbs. **$15.95**
ADA-47-4, dust cover, for use only with ADA-47-1, 1 lb. **$5.95**
ADA-47-1, Coordinated Base, simulated leather & ebony, 3 lbs. **$5.95**
ADA-57-2, Garrard LRS25 45 rpm spindle, 1 lb. **$3.80**

1. Single play spindle. 2. Retractable record platform. 3. Adjustable counterweight. 4. Stylus pressure adjustment. 5. Low mass tone arm. 6. Interchangeable cartridge clip. 7. Automatic control lever functions. 8. 12" Turntable. 9. Anti-static mat. 10. 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 4¾" above, 3" below motor board.

Garrard SL-55 4-Speed Automatic Stereo Turntable . . . Synchro-Lab Motor For Exact Speed Control



ADP-77
$59.50
(less cartridge & base)

NEW! Cartridge Options
Limit one per turntable order
Specify Heath Model No.
—see p. 65

1¢	$5
Shure M31E Reg. $29.95	Shure M93E Reg. $39.95
Pickering V15ACE-3 Reg. $29.95	Pickering V15ATE-3 Reg. $39.95
Empire 808E Reg. $29.95	Empire 888E Reg. $39.95

• 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, 12 lbs. . . no money dn., $6 mo. **$59.50**
ADA-77-3, Power-Matic base, 3 lbs. **$14.95**
ADA-77-1, Coordinated Base, simulated leather & ebony, 3 lbs. . . **$4.95**
ADA-77-4, dust cover, for use only with ADA-77-1, 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:** 14⅞" W x 12¾" D x 4¾" above, 2⅞" below motor board.

Popular, Low Priced Garrard 40 Mk II Automatic Stereo Turntable



ADP-46
$44.50
(less cartridge & base)

NEW! Cartridge Options
Limit one per turntable order
Specify Heath Model No.
—see p. 65

1¢	$5
Shure M75-6 Reg. $24.50	Shure M31E Reg. $29.95
Pickering V15AC-3 Reg. $24.95	Pickering V15ACE-3 Reg. $29.95
Empire 888 Reg. $24.95	Empire 808E Reg. $29.95

• 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. . . no money dn., $5 mo. **$44.50**
ADA-66-2, Garrard LRS20 45 rpm spindle, 1 lb. **$3.80**
ADA-77-1, Coordinated base, simulated leather & ebony, 3 lbs. . . . **$4.95**
ADA-77-3, Power-Matic Base, 3 lbs. **$14.95**
ADA-77-4, dust cover, for use only with ADA-77-1, 1 lb. **$4.95**

ADP-46 SPECIFICATIONS—Speeds: 16⅔, 33⅓, 45 & 78 rpm. **Motor:** 4-pole, hum shielded. **Tracking:** Tracks per cartridge specifications. **Color:** Gray and silver. **Wiring:** Stereo, amplok plug. **Cables furnished:** Line cord and 2 audio. **Power requirements:** 110-130 volts, 60 hertz AC. **Dimensions:** 14¼" W x 12½" D x 4⅜" above and 2⅞" below top of motor board.

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

Dual® Turntables For 1969



ADP-55

with 1c cartridge **$129.51** with $5 cartridge **$134.50**

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

1019 Auto/Professional Turntable

• Variable pitch control on all 4 speeds—6% range • Automatic tone-arm tracks below ½ gram, yet trips at zero • Direct dial, continuously variable anti-skating compensation • Feather-touch cue-control for manual & automatic play • 7½ 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 ½ gram steps for tracking pressure • Magnesium cartridge holder adjusts for optimum stylus overhang • Die-cast trim

EQUALS PROFESSIONAL STANDARDS OF PERFORMANCE. Features like the massive 7½ lb. dynamically balanced turntable, variable pitch control, continuously variable tracking pressure and magnesium tone-arm head put the Dual 1019 in the professional class. Even a better buy with either of the new cartridge options.

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, 3 lbs. **$8.95**

ADP-55 SPECIFICATIONS: Speeds: 16⅔, 33⅓, 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:** 7½ lb. dynamically balanced. **Color:** Black/Silver. **Cables furnished:** Line cord, 2 audio. **Power requirements:** 100-130 volts, 60 Hertz. **Dimensions:** Required mounting space; 11¾" x 12¾" x 6" above and 3" below motor board.



ADP-18

with 1c cartridge **$109.51** with $5 cartridge **$114.50**

New! Dual 1009F Auto/Professional Turntable

With Variable Pitch Control

• 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 ½ gram steps for tracking pressure • New modern designer styling • Automatic tone-arm tracks below ½ 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% • Variable 6% Pitch Control

COMPARE THESE EXTRA FEATURES. A free-floating tonearm during play . . . a tone resonance that's barely measurable at 6 or 7 Hz . . . a feather-touch slide switch that permits soft-spring footing to isolate the chassis from shock & acoustic feedback. Take advantage of the special cartridge offers.

Model ADP-18, turntable only, 15 lbs., no money dn., $11 mo. **$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, 3 lbs. **$8.95**

ADP-18 SPECIFICATIONS—Speeds: 33⅓, 45 and 78 rpm. **Turntable speed:** All 3 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:** 11¾" x 12¾" x 6" clearance above, 3" below. **Power requirements:** 117 VAC, 60 Hertz.

NEW! Cartridge Options Limit One Per Turntable Order

	ADP-55 Dual 1019	ADP-18 Dual 1009F	ADP-28 Dual 1015F	ADP-38 Dual 1212
1c offer	Shure M93E Pickering VI5ATE-3 Empire 888E			M31E VI5ACE-3 808E
$5 offer	Shure M91E Pickering VI5AME-3 Empire 888TE			M93E VI5ATE-3 888E

Specify Heath Model No.—See p. 65



ADP-28

with 1c cartridge **$89.51** with $5 cartridge **$94.50**

New! Dual 1015F Auto/Professional Turntable

• Dynamically balanced low mass tone arm tracks as low as ½ gram, yet trips at zero • Direct dial, anti-skating compensation to balance stylus force right in the groove • Auto/manual feather-touch cueing system for stylus placement on any groove • New variable 6% pitch control • "Hi-Torque" motor holds speed constant within 0.1% even when voltage varies ±10% • 4 lb. die cast platter • "Elevator-Action" spindle for conversion to changer play • Automatic & manual play of all 3 speeds

Model ADP-28, turntable only, 15 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, 3 lbs. **$8.95**

ADP-28 SPECIFICATIONS—Speeds: 33⅓, 45 and 78 rpm. **Turntable Speed:** All 3 speeds accurate within 0.1% with one to ten records. **Motor type:** 4-pole induction, shock & 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; Variable Pitch Control; Stop/Start Manual/Automatic switch; Cue Control. **Dimensions:** 11¾" x 12¾" x 6" clearance above, 3" below. **Power requirements:** 117 VAC, 60 Hertz.



ADP-38

with 1c cartridge **$74.51** with $5 cartridge **$79.50**

New Low Cost Dual 1212 Auto/Standard Turntable

• Continuously variable stylus force adjustment • Plays all 3 speeds automatically or manually • Tone arm tracks flawlessly as low as 1.5 grams • 3¾ lb. platter • Famous Dual "Hi-Torque" motor maintains speed accuracy within 0.1% even when voltage varies 10% • Rigid low-mass counterbalanced tone arm • Automatically applied anti-skating • Adjustable stylus overhang for minimum tracking error • Free-floating tone arm during play • Optional walnut base • New cartridge options

Model ADP-38, turntable only, 16 lbs. . . no money dn., $8 mo. **$74.50**
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, 3 lbs. **$8.95**

ADP-38 SPECIFICATIONS—Speeds: 33⅓, 45, and 78 rpm. **Turntable Speed:** all 3 speeds accurate within 0.1% with 1 to 6 records. **Record capacity:** one to six records. **Record sizes:** 7", 10", and 12". **Control functions:** Manual Speed Selector; Manual Record Size Selector; Start/Stop Manual/Automatic Switch; Variable Pitch Control; Cue Control. **Dimensions:** 10¹³⁄₁₆" x 13" x 5" clearance above, 2⅜" below. **Power Requirements:** 117 VAC, 60 Hz.

Heath Has The World's Largest Selection Of Electronic Kits—Over 300 To Choose From

Performance-Packed Stereo Accessories

HEATHKIT®

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



GD-187
$29.95

• Same high-quality Changer as used in the Heathkit GD-107 phonograph • Ideal for low-cost music systems and for replacement uses • Use with amplifiers having ceramic cartridge inputs • Complete instructions for conversion to magnetic cartridge inputs • Manual or automatic play of any size 78, 45, 33⅓ and 16 rpm records • Ceramic cartridge has diamond stylus for LP's, sapphire for 78's • Cartridge comes wired for stereo, can be rewired for mono • Beautifully styled walnut-grained vinyl-covered wood base • Measures 2¾" H x 14⅜" W x 12½" D overall • Includes two 3' audio cables • 45 rpm spindle adapter included • Completely assembled

GD-187, 12 lbs., no money dn., $5 mo. **$29.95**

GD-187 SPECIFICATIONS—Changer: Type, Maestro Model 52-93. **Speeds:** 16, 33⅓, 45 and 78 rpm. **Record sizes:** 7", 10" and 12". **Cartridge:** Stereo ceramic. **Stylus:** 0.7 mil diamond for LP's, 3 mil sapphire for 78's. **Power requirements:** 105-125 V., 60 Hz AC, 10 watts



Ⓐ *Telex "Adjustatone" Stereo Headset*

3½" 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.

Ⓑ *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.

Ⓒ *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**

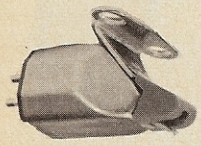
ADP-137 SPECIFICATIONS—Driver element: Dynamic. **Frequency response:** 30-20,000 Hz. **Impedance:** 4 to 16 ohm sources. **Distortion:** less than 1% at max. output. **Cord:** coiled, 10', 4-wire, 3-circuit plug. **Color:** gray-bronze cups, black cushions & band.

Ⓓ *Heathkit Stereo Headphone Control Unit*

Here's a convenient way to connect headphones to most listening sources. Control unit with 20' cable permits selection of speakers or headphones and control of volume and balance from your favorite chair. Works with recorders, phonos, radios, and TV as well as any monophonic amp. (tube or transistor) and the following Heathkit stereo amps. and receivers (AA-32, AA-14, AR-14, AR-15). Accepts 2 sets of stereo headphones (4-wire, 3-connector types) or 2 sets of mono headphones (2-connector types). Small beige metal case can be hand-held or set in any location. Connection information included. Assemble in one or two hours.

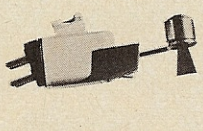
Kit AC-17, 3 lbs. **$7.95**

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 2⅝" H including control knobs.



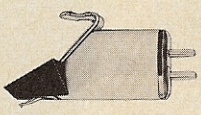
Empire 888E Magnetic

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:** 15x10⁻⁶ cm/dyne. **Tracking force:** ¾ to 1.6 grams. **Vertical tracking angle:** 15°.
Model AD-96H, 1 lb. **$39.95**



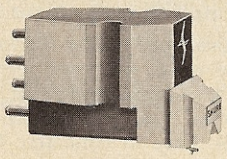
Pickering V15ATE-3 "Magnetic"-With Lint Brush

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**



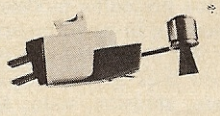
Empire 808E Elliptical

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 10⁻⁶ cm/dyne. **Tracking force:** 1 to 4 grams. **Tracking angle:** 15°.
Model AD-127T, 1 lb. **$29.95**



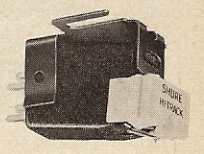
Shure M31E-EP Magnetic

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 10⁻⁶ cm/dyne. **Tracking force:** 1 to 2 grams. **Tracking angle:** 15°.
Model AD-107L, 1 lb. **$27.50**



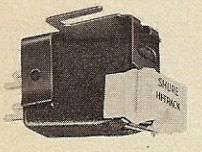
Pickering V-15/ACE-3 Dustomatic

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 10⁻⁶ cm/dyne. **Tracking force:** 3 to 5 grams.
Model AD-117W, 1 lb. . . . **$29.95**



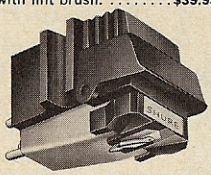
Shure M93E Elliptical

AD-58R MANUFACTURER'S SPECIFICATIONS—Frequency response: 20 to 20,000 Hz. **Output:** 10mV at 1 kHz. **Separation:** 25 dB @ 1 kHz. **Load impedance:** 47,000 ohms. **Stylus:** .4 x .7 mil elliptical diamond. **Tracking force:** 1½ to 3 grams. **Tracking angle:** 15°.
Model AD-58R, 1 lb. **$39.95**



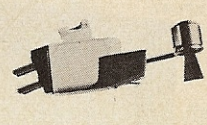
Shure M91E HiTrack Elliptical

AD-68F MANUFACTURER'S SPECIFICATIONS—Frequency response: 20 to 20,000 Hz. **Output:** 10 mV at 1 kHz. **Separation:** 25 dB @ 1 kHz. **Load impedance:** 47,000 ohms. **Stylus:** .2 x .7 mil elliptical diamond. **Tracking force:** ¾ to 1½ grams. **Tracking angle:** 15°.
Model AD-68F, 1 lb. **$49.95**



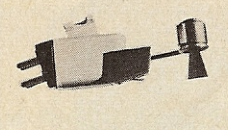
Shure M75-6 Magnetic

AD-98J MANUFACTURER'S SPECIFICATIONS—Frequency response: 20 to 20,000 Hz. **Output:** 10 mV at 1 kHz. **Separation:** 25 dB @ 1 kHz. **Load impedance:** 47,000 ohms. **Stylus:** .6 mil conical diamond. **Tracking force:** 1½ to 3 grams. **Tracking angle:** 15°.
Model AD-98J, 1 lb. **$24.50**



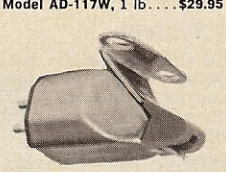
Pickering V-15/AME-3 Dustomatic

AD-78A MANUFACTURER'S SPECIFICATIONS—Frequency response: 20 to 25,000 Hz. **Output:** 5.0 mV. **Separation:** 35 dB. **Load impedance:** 47,000 ohms. **Stylus:** .2 x .9 mil elliptical diamond. **Tracking force:** ¾ to 1½ grams. **Tracking angle:** 15°.
Model AD-78A, 1 lb. **$49.95**



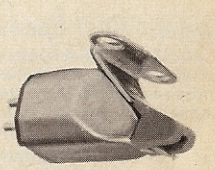
Pickering V-15/AC-3 Dustomatic

AD-108D MANUFACTURER'S SPECIFICATIONS—Frequency response: 20 to 20,000 Hz. **Output:** 6.9 mV. **Separation:** 30 dB. **Load impedance:** 47,000 ohms. **Stylus:** 7 mil conical diamond. **Tracking force:** 3 to 7 grams. **Tracking angle:** 15°.
Model AD-108D, 1 lb. . . . **$24.95**



Empire 888TE Elliptical

AD-88C MANUFACTURER'S SPECIFICATIONS—Frequency response: 8 to 32,000 Hz. **Output:** 6.0 mV per channel. **Separation:** 30 dB. **Load impedance:** 47,000 ohms. **Stylus:** .2 x .7 elliptical diamond. **Tracking force:** ½ to 3 grams. **Tracking angle:** 15°.
Model AD-88C, 1 lb. **$49.95**



Empire 888 Magnetic

AD-118M MANUFACTURER'S SPECIFICATIONS—Frequency response: 12 to 25,000 Hz. **Output:** 8.0 mV per channel. **Separation:** 30 dB. **Load impedance:** 47,000 ohms. **Stylus:** .7 mil diamond. **Tracking force:** ¾ to 5 grams. **Tracking angle:** 15°.
Model AD-118M, 1 lb. . . . **$24.95**

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

Heathkit® High Performance Speakers...



AS-16

$49.95



AS-10U

$59.95

Compact 2-Way Acoustic Suspension System . . . High Quality 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.

MINI-SIZE . . . MAXI-PERFORMANCE. Don't be fooled by the size. The 8" acoustic suspension woofer with a 6.8 oz. magnet literally rides on air to give rich, low distortion bass to 45 Hz . . . the 3½" tweeter with 4.8 oz. magnet reproduces crystal-clear highs to 20 kHz, and has a level control for balance. You'll hear everything with an authenticity you never dreamed of in a system this size.

BUILD IN 1 TO 2 HOURS. Both speakers already cabinet-mounted . . . just wire the 1500 Hz crossover network. You'll like the rich looks of the walnut cabinet and it's protected against scratches and spills by a 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. 49; AR-14, pg. 52; AA-22, pg. 49; AA-21D, pg. 55; AA-23, pg. 60; AA-13, pg. 60. **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.

High Performance Acoustic Suspension System . . . Wide Response . . . Compact Versatility

• 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-philes 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.

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. 55; AA-22, pg. 49; AA-13 & AA-23, pg. 60; AR-13A, pg. 49; AR-15, pg. 44-45. **Frequency response:** 30 to 15,000 Hz. **Impedance:** 16 ohms. **Recommended amplifier power:** 10 to 40 watts. **Enclosure:** Infinite baffle, sealed. **Speakers:** Woofer, 10" Acoustic Suspension ceramic magnet; Tweeter, two 3½" cone units in dispersed array, 1.47 oz. magnets. **Crossover:** L-C network, 2250 Hz. **Control:** High frequency level. **Dispersion:** 90° horizontal. **Cabinet:** Factory assembled ¾" furniture grade plywood. **Dimensions:** 13½" H x 24" W x 11½" D.

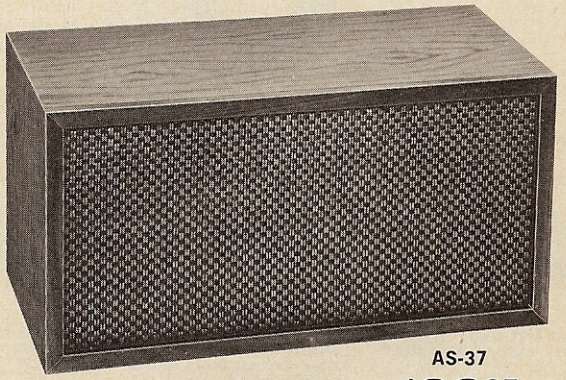
The Famous Heathkit AS-37 . . . Still At The Original 1955 Price!

• 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. Improved technology has kept the cost down, but improved the system: a ceramic magnet now in the woofer . . . cabinet now uses a polyester covering . . . a durable, good looking finish resistant to fade, abrasion, stains & heat. Easy to build too. Order a pair for stereo.

Kit AS-37, 29 lbs., no money dn., $5 mo. **$39.95**

AS-37 SPECIFICATIONS—Recommended amplifiers: AR-14, pg. 52; AR-17 & AR-27, pg. 54; AA-14, pg. 52; AA-32, pg. 60; AR-13A, pg. 49; AA-21D, pg. 55; AA-22, pg. 49; AA-13 & AA-23, pg. 60. **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 11⅛" D. **Finish:** Walnut, satin finish, polyester plastic. **Shipping weight:** 27 lbs.



AS-37

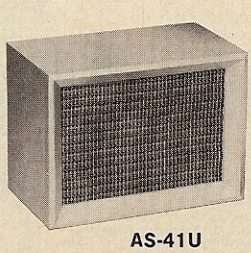
$39.95

Lowest Cost Speaker System

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

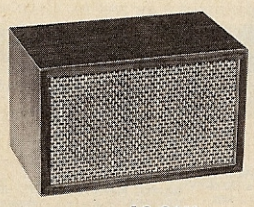
Kit AS-41U, unfinished, 8 lbs. **$10.95**
Kit AS-41W, walnut, 8 lbs. **$12.95**

AS-41 SPECIFICATIONS—Recommended amplifiers: AA-14, pg. 52; AA-32, pg. 60; AA-13, pg. 60; AR-14, pg. 52. **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. Alinco 5 magnet. **Cabinet:** Factory assembled, furniture-grade ½" plywood. **Dimensions:** 8" H x 11" W x 6½" D.



AS-41U

$10.95



AS-81U

$17.50

The Space-Problem Solver

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

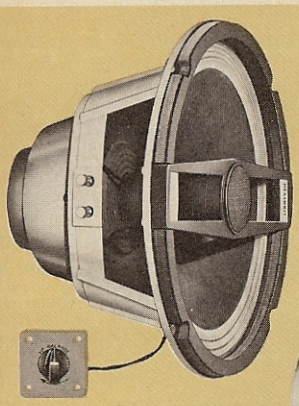
Kit AS-81U, unfinished, 10 lbs. . . . **$17.50**
Kit AS-81W, walnut, 10 lbs. **$19.95**

AS-81 SPECIFICATIONS—Recommended amplifiers: AA-14, pg. 52; AA-32, pg. 60; AA-13, pg. 60; AR-14, pg. 52. **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 6⅜" D; Material ½" veneer plywood. **Speakers:** Tweeter, 3" cone type, 8 ohms, .53 oz. Alinco 5 magnet; Woofer, 5½" cone type, 8 ohms, 10 oz. Syntox No. 6 magnet. **Crossover:** Capacitor type.

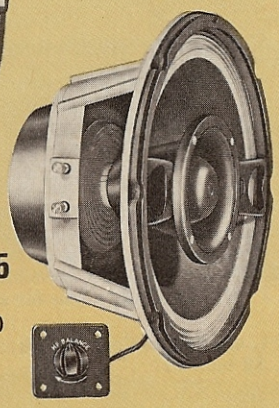
Heathkit Performance Specifications Are Guaranteed

Systems Or Separates

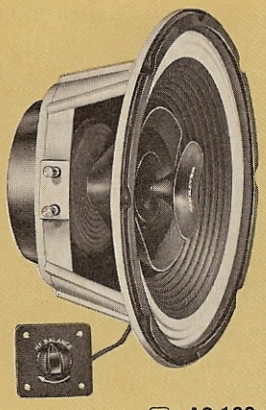
HEATHKIT®



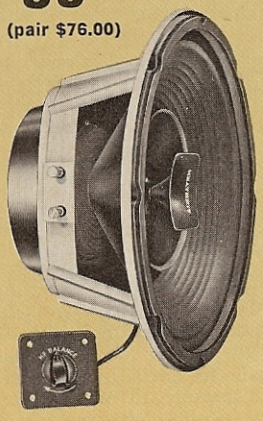
Ⓐ AS-27
$69.50
(pair $132.00)



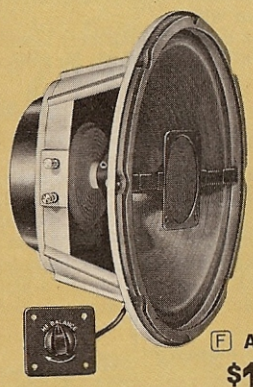
Ⓑ AS-183
$49.95
(pair $95.00)



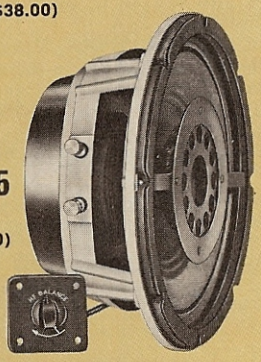
Ⓒ AS-173
$39.95
(pair $76.00)



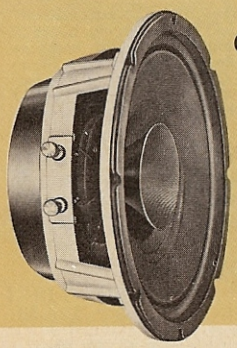
Ⓓ AS-163
$29.95
(pair $57.00)



Ⓔ AS-153
$19.95
(pair $38.00)



Ⓕ AS-133
$14.95
(pair $28.50)



Ⓖ AS-123
$9.95
(pair $19.00)

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

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

Model AS-27, 14 lbs. . . no money dn., $7 mo. **$69.50**
Model AS-27-2, 28 lbs. . . no money dn., $13 mo. . . . . Pair **$132.00**
AS-27 SPECIFICATIONS—Size: 12″. **Impedance:** 8 ohms. **Power rating:** 40 watts. **Frequency response:** 20-20,000 Hz. **Cone resonance:** 25Hz. **Magnet Weights:** 1 lb., 6.4 oz., 4.6 oz. **Voice coil sizes:** 1½″ and 1″.

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

12″ high compliance, edge-damped woofer with a reflexed horn high frequency unit. Wide response: 20—15 kHz; low crossover frequency. 1½″ and 1″ voice coils; heavy die cast frame; separate high frequency level control; 1 year guarantee. Buy two for superb stereo.

Model AS-183, 15 lbs. . . no money dn., $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:** 25Hz. **Magnet weights:** 1¾ lbs., 4.65 oz.

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

12″ woofer; high compliance cone for mid-range; special Heath designed tweeter; heavy die-cast frame; built-in crossover networks; 1¾ lb. ceramic magnet; high frequency level control; 1 yr. guarantee. Choose two for stereo.

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. **Frequence response:** 35-15,000 Hz. **Cone resonance:** 40 Hz. **Magnet weights:** 1¾ lbs., 2½ oz.

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

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

Model AS-163, 12 lbs. . . no money down, $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″.

Ⓔ *12" 2-Way Hi-Fi Coaxial Speaker*

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

Model AS-153, 10 lbs. **$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 9/16″.

Ⓕ *8" Two-Way Coaxial Hi-Fi Speaker*

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

Model AS-133, 6 lbs. **$14.95**
Model AS-133-2, 12 lbs. . . no money dn., $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 9/16″.

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

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

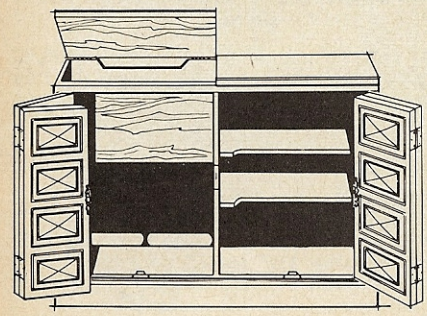
Model AS-123, 5 lbs. **$9.95**
Model AS-123-2, 10 lbs. . . . . Pair **$19.00**
AS-123 SPECIFICATIONS—Size: 8″. **Impedance:** 8 ohms. **Power rating:** 12 watts. **Frequency response:** 50-12,000 Hz. **Cone resonance:** 70 Hz. **Magnet weight:** 10 oz. **Voice coil size:** 1″.

Save 5% On Your Heathkit Stereo/Hi-Fi System—Order Any Program Source, Amplifier, And Speaker; Deduct 5%

Deluxe Stereo Hi-Fi Furniture

HEATHKIT®

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



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

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

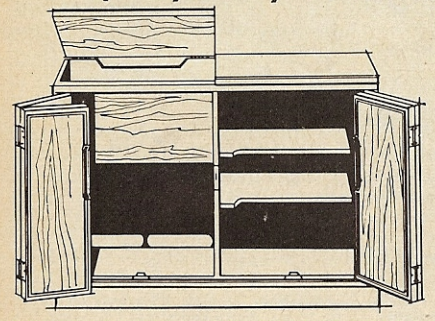
Model AE-57, equipment cabinet, 110 lbs. . . no money dn., $14 mo. **$150.00**

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

Matching Speaker Cabinet. Same rich Mediterranean styling and superb craftsmanship as the AE-57 equipment cabinet. Tubular-duct reflex design so you can easily match it to any 8" or 12" speaker for perfect resonance with the instructions included. Ornate metal scroll grille adds to its Old World Spanish styling. Completely assembled and finished. Measures 17 3/8" W. x 19 3/16" 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**

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 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.

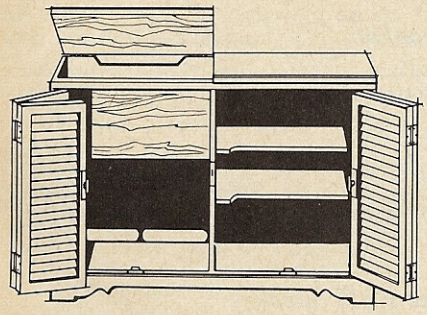
Model AE-37, equipment cabinet, 103 lbs. . . no money dn., $12 mo. **$125.00**

AE-37 EQUIPMENT CABINET ACCOMMODATIONS AND SIZES: Cabinet Overall: 40" W. x 19" D. x 28 3/8" H. **Changer Compartment:** 19" W. x 16 3/32" D., mounting board is uncut and can be adjusted in height to accept all record changers, tape recorders and turntables sold by Heath; lid has friction-loaded hinges. **Record-Tape Recorder Compartment:** 19" W. x 16 3/32" D. x 15 3/4" H. **Shelf Compartment:** Overall interior dimensions, 19" W. x 16 3/32" D. x 24 3/16" H. with two shelves adjustable 4, 5, 6, 10, 11, 12, 16, 17, or 18 inches from the top of cabinet. Accepts any Heathkit receiver, tuner or amplifier.

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

Model AEA-37-1, speaker cabinet, 64 lbs. . . no money dn., $6 mo. . . . . each **$59.50**

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



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

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

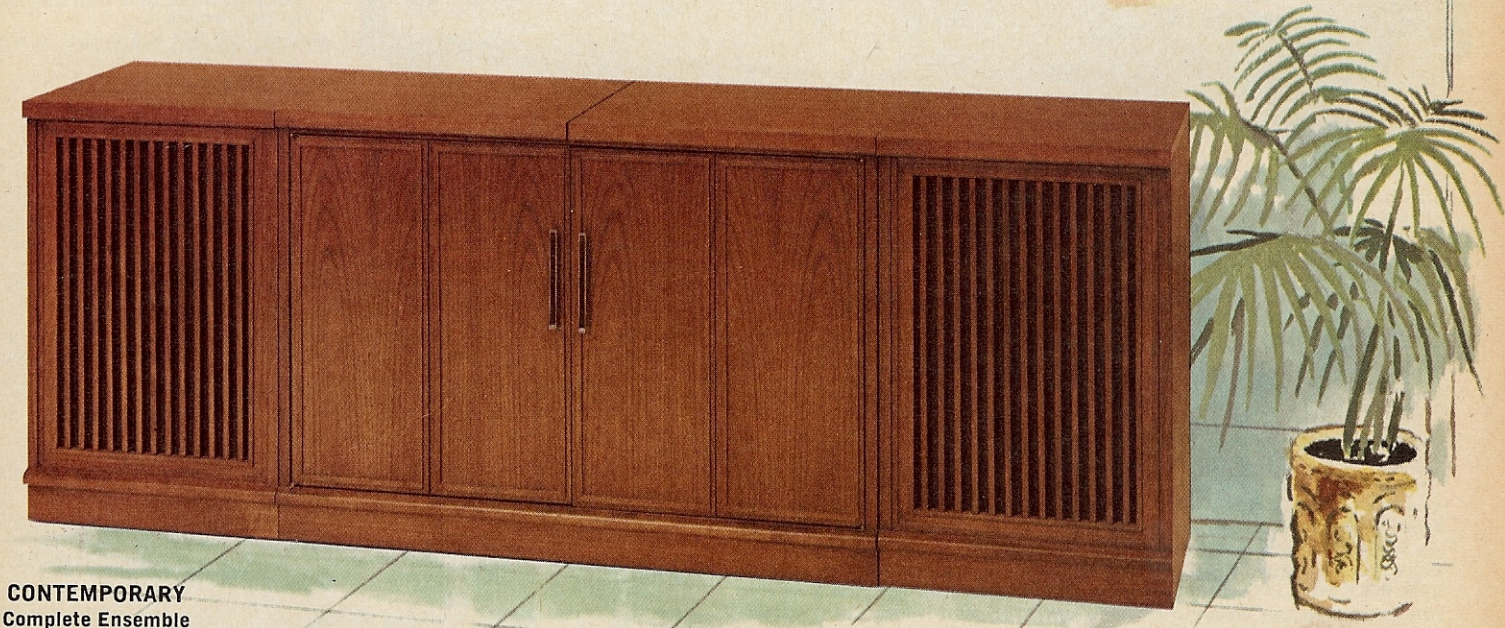
AE-47 EQUIPMENT CABINET ACCOMMODATIONS AND SIZES: Cabinet Overall: 40" W. x 19" D. x 28 7/8" H. **Changer Compartment:** 19" W. x 16" D., mounting board is uncut and can be adjusted in height to accept all record changers, turntables, and tape recorders sold by Heath; lid has friction-loaded hinges. **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 3/16" H. with two shelves adjustable 4, 5, 6, 10, 11, 12, 16, 17 or 18 inches from the top of the cabinet. Accepts any Heathkit receiver, tuner or amplifier.

Matching Speaker Cabinet . . . features tubular-duct reflex design so you can easily match it to any 8" or 12" speaker for perfect resonance with the instruction sheet included. Handsome wood spindle grille. Completely assembled and finished to match the AE-47 equipment cabinet. Measures 18" W. x 19" D. x 28 7/8" H. Order a pair for stereo.

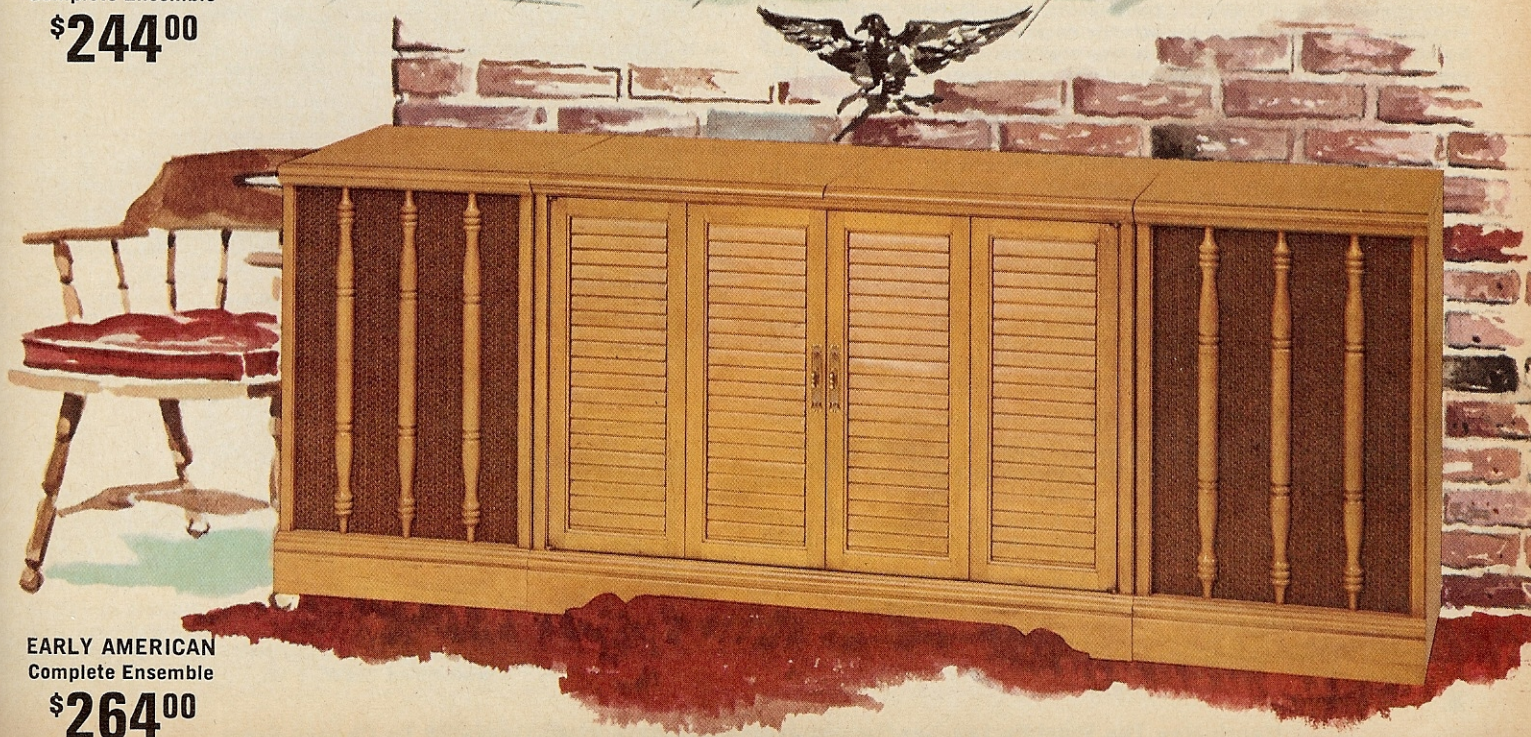
AEA-47-1, speaker cabinet, 64 lbs. . . no money dn., $7 mo. . . . . each **$64.50**



MEDITERRANEAN
Complete Ensemble
$299.00
AVAILABLE NOV.



CONTEMPORARY
Complete Ensemble
$244.00

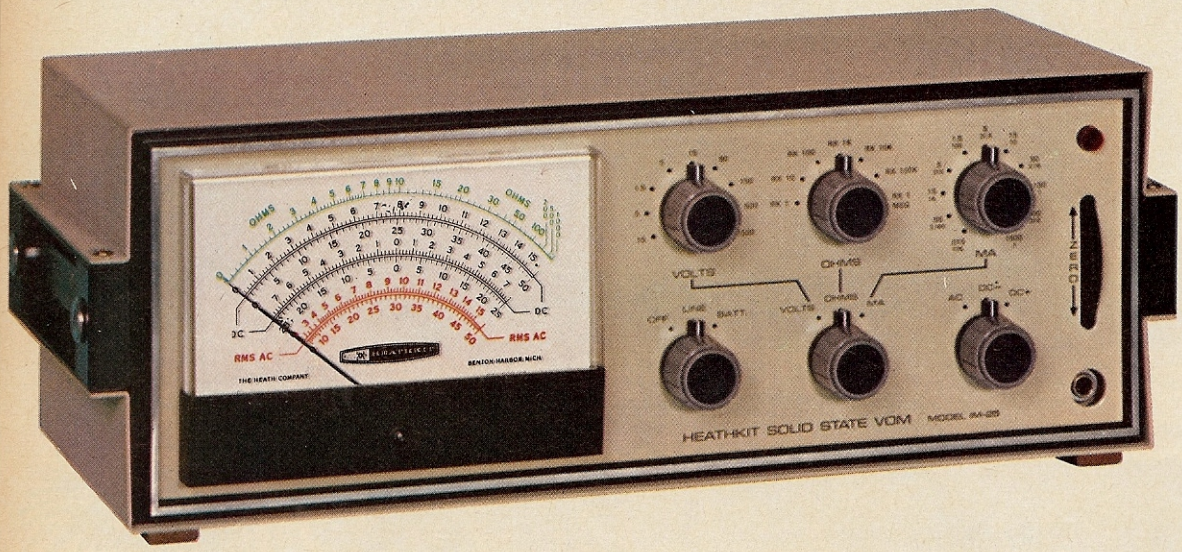


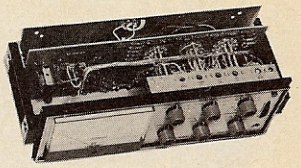
EARLY AMERICAN
Complete Ensemble
$264.00

TEST INSTRUMENTS

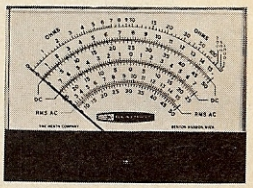
Heathkit® Test Instruments...

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





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.

Kit IM-25 **$80.00**

Wired IMW-25 **$115.00**

Until Now You Couldn't Buy A Comparable Instrument For 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 μA 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 μA 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

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

ENGINEERED FOR UTILITY . . . for example, the "floating" input isolates circuit ground from the cabinet; the cabinet is grounded through the 3-wire line cord. Troublesome ground loops due to line coupling are easily eliminated by switching to battery power and disconnecting the line cord. Zero-drift when changing from battery to line operation is negligible due to double Zener-diode regulation. DC voltage measurements require only a shorted input check of meter zero for maximum specified accuracy. And the ten-turn thumbwheel gives precise zero settings. Change from DC volts to Ohms-mA-AC with just a flip of the finger-tip switch on the improved probe . . . separate range switches for volts-ohms-mA permit leaving range switches in most-used position, switching function with one simple operation!

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

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

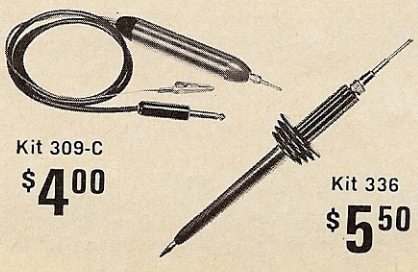
Kit IM-25, 10 lbs., no money dn., $8 mo. **$80.00**
Assembled IMW-25, 10 lbs., no money dn., $11 mo. **$115.00**

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:** ±3% of full scale. **DC MILLIAMMETER—11 Ranges:** 0-.015, .05, .15, .5, 1.5, 5, 15, 50, 150, 500, 1500 mA full scale. **Input resistance:** 0.10 ohm (1500 mA) to 10k ohm (.015 mA). **Accuracy:** ±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:** ±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:** ±5% of full scale. **OHMMETER—7 Ranges:** 10 ohm center 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 μA, 100° movement. **Transistors & Diodes:** (2) 2N4304 FETransistor. (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 (not supplied). Line operation; Transformer operated ½ wave circuit, operable on either 120 or 240 V AC, 50-60 Hz. **Dimensions:** 16½" W x 5⅞" H x 7¾" 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**



Kit 309-C **$4.00**

Kit 336 **$5.50**

30,000 Volt DC High Voltage Probe Kit

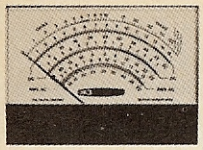
Invaluable for work where extremely high voltages are measured. Sleek red & black plastic body provides plenty of insulation for safety. The multiplication factor is 100 on the DC ranges of any 11 megohm input meter . . . provides a useful 1100 megohm input for measuring voltages as low as 50 volts in very high impedance circuits.

Kit 336, 1 lb. **$5.50**
Assembled 336W, 1 lb. **$6.50**

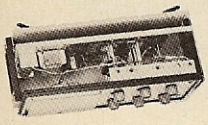
Heath Has The World's Largest Selection Of Electronic Kits—Over 300 To Choose From

Versatile Voltmeters

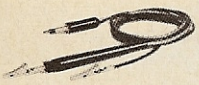
HEATHKIT®



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



Modern, Stable, Easy-to-Follow Circuit Board Construction . . . eliminates the maze of point-to-point voltage divider resistors, makes assembly easy.



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



Kit IM-16 $44.95

Wired IMW-16 $64.95

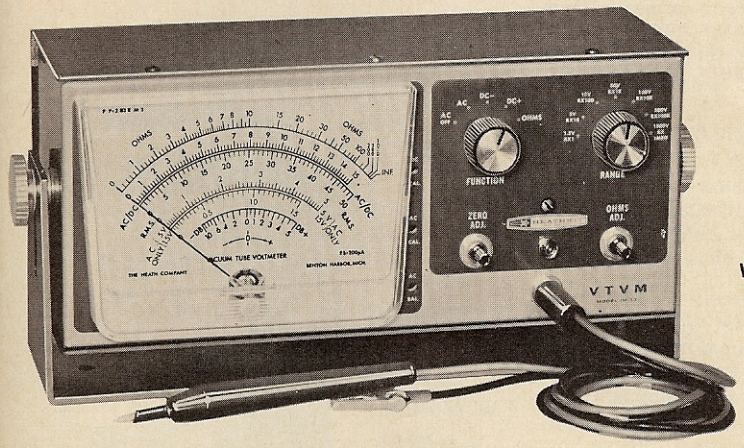
New Heathkit IM-16 Deluxe Solid-State Volt-Ohm-Meter . . . Battery Powered Portability Plus Built-In AC Supply

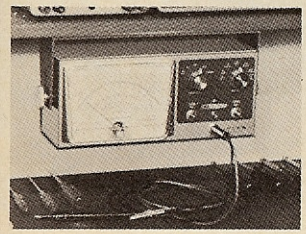
• All solid-state circuitry • For heat-free trouble-free performance & easy portability • 8 DC voltage ranges from 0.5 volts to 1500 volts full scale • 8 AC voltage ranges from 0.5 volts to 1500 volts full scale • 7 ohmmeter ranges x1 (with 10 ohms at center scale), x10, x100, x1k, x10k, x100k, and x1 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 • Zener-diode regulation allows quick change from external to internal power with only a zero-adjust "touch-up" • Essentially drift-free zero • Special alligator clip on probe permits safe, hands-free voltage checks • Requires only 1 standard size "C" cell for "ohms" measurements and one 9 volt NEDA 1602 cell or equivalent for complete portability • Separate switches for individual functions reduce constant knob twisting • Wiring harness and circuit board construction help eliminate frustrating wiring errors, mean lighter weight • New Heathkit "unitized" instrument styling—front panels with straight-forward, uncluttered styling—cabinets that are truly functional, featuring carrying handles and separate top and bottom shells • Cabinet top & bottom shells remove easily to completely expose components and circuitry • Top and bottom are flat so instruments can be safely, conveniently stacked • Handsome beige and black styling

Kit IM-16, 10 lbs., no money dn., $5 mo. $44.95

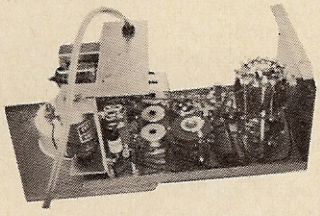
Assembled IMW-16, 11 lbs., no money dn., $7 mo. $64.95

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 (one "C" cell), batteries not supplied. **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:** 16⅜" L x 7¾" D x 5⅞" H. **Net weight:** 7½ lbs. (with batteries).





Secure Gimbal Mounting 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.

Heathkit "Service Bench" VTVM

Accurate—Easy To Read—Quick To Use

Kit IM-13 $36.50

Wired IMW-13 $56.95

• Measures AC volts (RMS), DC volts, resistance, and audio levels • 7 AC volts, 7 DC volts, and 7 resistance ranges • Separate 1.5 & 5 volt AC scales for high accuracy • Large, easy-to-read 6 inch meter face • Gimbal mounting bracket for added visibility from all locations around the test bench • Smooth ten-turn vernier controls for zero & ohms adjust • One test probe for all measurements—the ground lead has an alligator clip for added convenience • Easy calibration • Extra wide response • Quick, sure operation • "Service Bench" styling

THE IM-13 HAS THE SAME PERFORMANCE SPECS AS THE IM-11 . . . 1% precision resistors, response to 1 MHz and more . . . but it also has a large 6" meter, extra low voltage AC scales, single probe convenience and handy gimbal mounting. Easy to operate too—just a function selector, a range selector and two adjust controls. "Set and Forget" calibration—all controls are screwdriver adjustable from the front panel. Choose the IM-13 kit or assembled . . . either way, you reap big savings over comparable units.

Kit IM-13, 7 lbs., no money dn., $5 mo. $36.50

Assembled IMW-13, 7 lbs. . . . no money down, $6 mo. $56.95

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

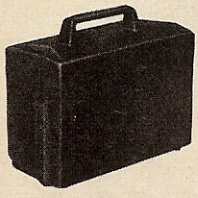
IM-13 SPECIFICATIONS—Meter scales DC & AC (RMS): 0-1.5, 5, 15, 50, 150, 500, 1500 volts full scale (1.5 and 5 volt AC ranges read on separate scales). **Ohm-meter:** Scale with 10 ohm center x1, x10, x100, x1000, x10K, x100K, x1 meg. Measures 1 ohm to 1000 megohms with internal battery. **Dividers:** 1% precision type. **Meter:** 6" 200 μA movement. **DC Input resistance:** 11 megohms (1 megohm in probe) on all ranges. **AC Input impedance:** 1 megohm shunted by 40 pF (measured at input terminals). **Circuit:** Balanced bridge (push-pull) using twin triode. **Accuracy:** DC ±3%, AC ±5% of full scale. **Frequency response:** ±1 dB, 25 Hz to 1 MHz (600 ohm source). **Tubes:** 12AU7, 6AL5. **Battery:** 1.5 volt size "C" flashlight cell (not supplied). **Power requirements:** 105-125 volts 50/60 Hz, AC 10 watts. **Dimensions:** 5" H x 12 11/16" W x 4¾" D.

Heathkit Performance Specifications Are Guaranteed

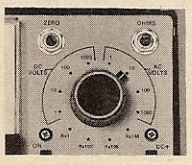
Heathkit® Test Instruments...

IM-17
$21.95





Self-Contained, Portable Case
Just flip the catch on the handle and your IM-17 is ready to use. The rugged polypropylene case holds everything in place, even the test leads. Finished, close the molded-in cover, grab the handle and your IM-17 is ready to go, safely.



12 Position Function Switch
Continuous rotation—no "backing up". Select all ranges easily . . . and ranges are marked in different colors so you can spot them quickly. Simple, convenient.

Heathkit IM-17 Volt-Ohm-Meter . . . Solid-State Reliability . . . Lowest Cost . . . Hundreds Of Uses

• Solid-state circuit–high impedance 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 μA meter • Battery powered • Rugged polypropylene case with self cover & handle includes storage space for test leads • Easy-to-build circuit board construction

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

DOES HUNDREDS OF EVERYDAY MEASUREMENTS AT LOWEST COST. Features four ranges on AC and DC volts that 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. As an added convenience, there's an extra jack to connect high voltage and RF probes to extend its basic capabilities.

BATTERY POWERED TO WORK ANYWHERE . . . runs on a "C" cell and 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. Simple circuit board construction and the famous Heathkit manual combine to make assembly simple and quick. Build the IM-17 in 3 to 4 hours; use it for years to come.

Kit IM-17, 4 lbs. **$21.95**

IM-17 SPECIFICATIONS—DC VOLTMETER: Four Ranges: 0-1, 10, 100, 1000 volts full scale. **Input resistance:** 11 meg. on all ranges. **Accuracy:** ±3% of full scale. **AC VOLTMETER: Four Ranges:** 0-1, 10, 100, 1000 volts full scale. **Input resistance:** 1 meg. on all ranges. **Accuracy:** ±5% of full scale. **Frequency response:** ±1 dB, 10 Hz to 1 MHz. **OHMMETER: Four Ranges:** Rx1, x100, x10K, x1 meg. **POWER SUPPLIES: Ohms circuit:** 1.5 V "C" Cell. **Amplifier circuit:** 8.4 V mercury cell (NEDA #1611), batteries not supplied. **GENERAL: Meter:** 4½", 200 uA, 100° movement. **Dimensions:** 8½" W x 4⅛" H x 7⅛" D.

Heathkit IM-11 VTVM—The World's Most Popular VTVM . . . For A Lot Of Very Good Reasons

• 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

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. It is also a part of the sophisticated Berkeley Physics Laboratory.

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.

SIMPLE, SINGLE PROBE . . . avoids tangled leads, saves time in changing 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.

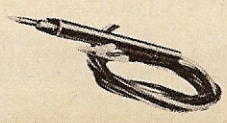
Kit IM-11, 5 lbs., no money dn., $5 mo. **$28.50**
Assembled IMW-11, 5 lbs., no money dn., $5 mo. **$47.95**
Export model available for 115/230 VAC, 50-60 Hz.

Kit IM-11
$28.50

Wired IMW-11
$47.95



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 megohms. **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:** 7⅜" H x 4¹⁵⁄₁₆" W x 4⅛" D.



SINGLE PROBE CONVENIENCE
Slim, all-purpose probe with switch for all functions and unique clip-action for hands-free connections.

Heath Has The World's Largest Selection Of Electronic Kits—Over 300 To Choose From

Modern Engineering...Priced For Savings



MM-1
$29.95

Heathkit Portable VOM With 20 K Ohms/Volt Accuracy . . . Engineered For Dependable Performance & Great Versatility

• 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 2¼ 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:** Midscale, 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 . . . 10 AC Ranges . . . 10 Hz to 1 MHz Response

• 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. **$39.50**

Assembled IMW-21, 5 lbs., no money dn., $6 mo. **$54.95**

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:** 7⅜" H x 4-11/16" W x 4⅛" D.



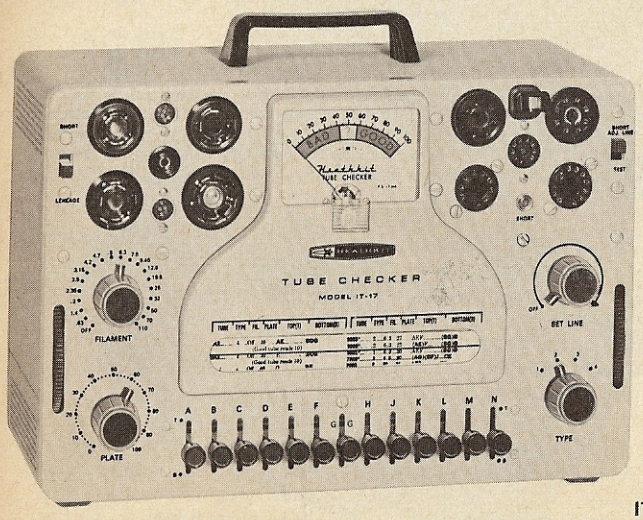
Kit IM-21
$39.50

Wired IMW-21
$54.95

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

TEST INSTRUMENTS

Heathkit® Tube Testers



IT-17
$49.95



TT-1A
$160.00

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 is read on a multi-colored "bad-?-good" meter scale and a neon bulb indicator shows filament continuity and leakage or shorts between elements.

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

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

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

Kit IT-17, 12 lbs. . . no money 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, loctal, 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 checkers can be purchased either singly or on a subscription basis which assures a new roll chart plus two supplements per year. Prices are $3.00 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.

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

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

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

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

Kit TT-1A, 33 lbs. . . no money dn., $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: ¼ microampere sensitivity. Voltage regulator: firing voltage and regulation tolerance. Low power thyratron: grid characteristics, conduction capabilities. Eye tubes: control grid characteristics. **Meter:** AC: 1000 ohms/volt (1 volt full scale). DC: .89 ma full scale. Scales: Gm, 0-3000 micromhos. VR test volts, 0-200. Leakage, 0-10 megohms. Diodes, OK. Rectifiers, OK. Line check arrow at midscale. **Tube complement:** (1) 3A4 oscillator and (1) 12AV6 meter control. **Calibration circuit:** Built-in, switch operated. **Socket accommodations:** 4-pin, 5-pin, 6-pin, 7-pin combination and pilot light, 7-pin miniature, 7-pin subminiature, 8-pin subminiature, octal, loctal, 9-pin miniature, 10-pin miniature, 5-pin and 7-pin nuvistors, 9-pin novar, 12-pin compactron and blank. **Line voltage adjustment:** Continuously variable. **Roll chart mechanism:** Constant tension, free rolling, dual thumbwheel operated, illuminated. **Dimensions:** Cabinet (outside): 17¾" W x 13½" H x 8" D. Panel & chassis: 17" W x 12¾" H x 5½" D.

HEATHKIT®

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

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

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

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

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

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

Kit IT-18, 4 lbs. . . no money dn., $5 mo. **$24.95**

IT-18 SPECIFICATIONS—D. C. Beta: x1 range—2 to 100, x10 range—20 to 1000. **Out-of-circuit accuracy:** ±5%. **In-circuit accuracy:** Indicates good or bad (accuracy depends upon circuit being tested); Iceo (out-of-circuit only)—0-5000 uA; Icbo (out-of-circuitry only) 0-5000 uA diodes; forward or reverse current—0-5000 uA. **Power:** One standard "D" cell (not supplied). **Dimensions:** 8½" wide, 4⅞" high, 7⅛" deep (including handle). **Net weight:** 2¼ lbs.

THROUGH HEATH NEW RESEARCH



Kit IT-18 **$24.95**

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

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

Improved Heathkit Laboratory Transistor Tester



Kit IM-36 **$60.00**

Wired IMW-36 **$90.00**

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

Kit IM-36, 9 lbs., no money dn., $6 mo. **$60.00**

Assembled IMW-36, 11 lbs., no money dn., $9 mo. **$90.00**

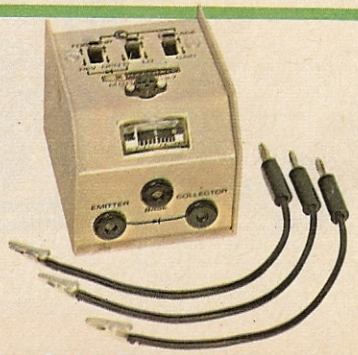
IM-36 SPECIFICATIONS—Checks: Transistors up to 15 amps and diodes up to 1.5 amps. **Tests:** Shorts, DC Gain (Beta 0-200 & 200-400), Leakage (Icbo, Iceo), Diode Forward and Reverse Current. **Meter:** Current Ranges: 15 μA, 150 μA, 1.5 mA, 15 mA, 150 mA, 1.5 A, 15 A; Voltage Ranges: 1.5 V, 5 V, 15 V, 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, Icbo and Iceo or diode currents. **Two voltage selector switches:** Gain and Leak Test Voltage can be individually preset at different voltage levels. **Two current range switches:** Collector and Leak currents can be individually preset on different adjacent ranges. **Transistor and diode connections:** Universal transistor socket and binding posts. **External power supply connections:** Binding Posts for Gain, Leak and Bias supplies.

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

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

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

IT-27 SPECIFICATIONS—Transistor test: Leakage, short, open, and current gain. **Diode test:** Forward and reverse current. Also serves as a continuity checker. **Switches:** Forward-Reverse/PNP-NPN, Diode/Hi-Lo, Leakage-Gain. **Power supply:** Self-contained, two 1.5 volt size "C" flashlight cells (not supplied). **Dimensions:** 3⅛" H x 3⅛" W x 3¾" D.

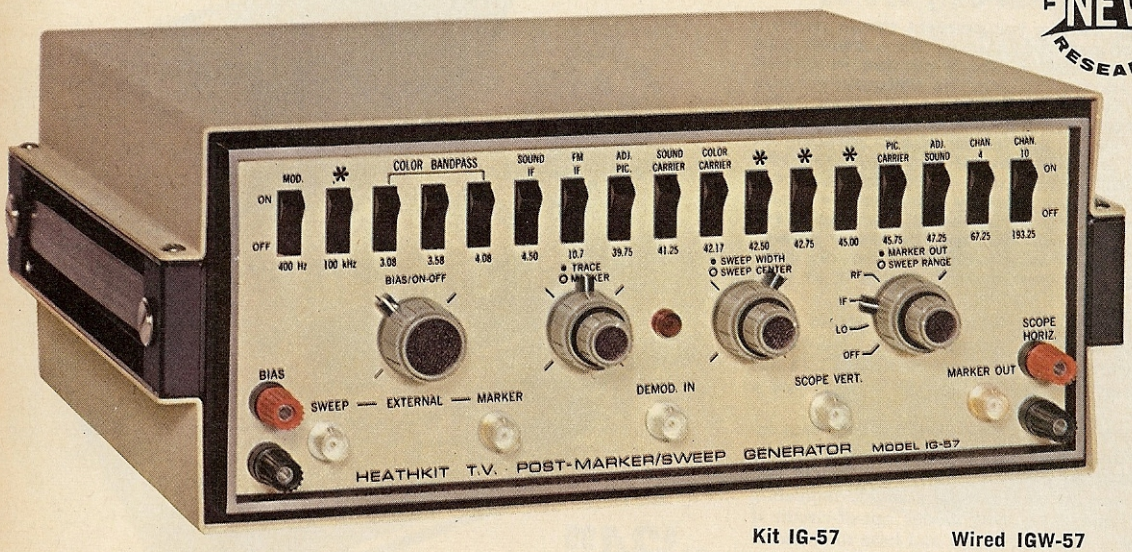


Kit IT-27 **$6.95**

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

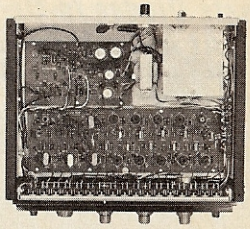
Heathkit® Instruments Are An Unbeatable

THROUGH HEATH RESEARCH NEW

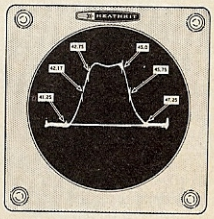


Kit IG-57
$135.00

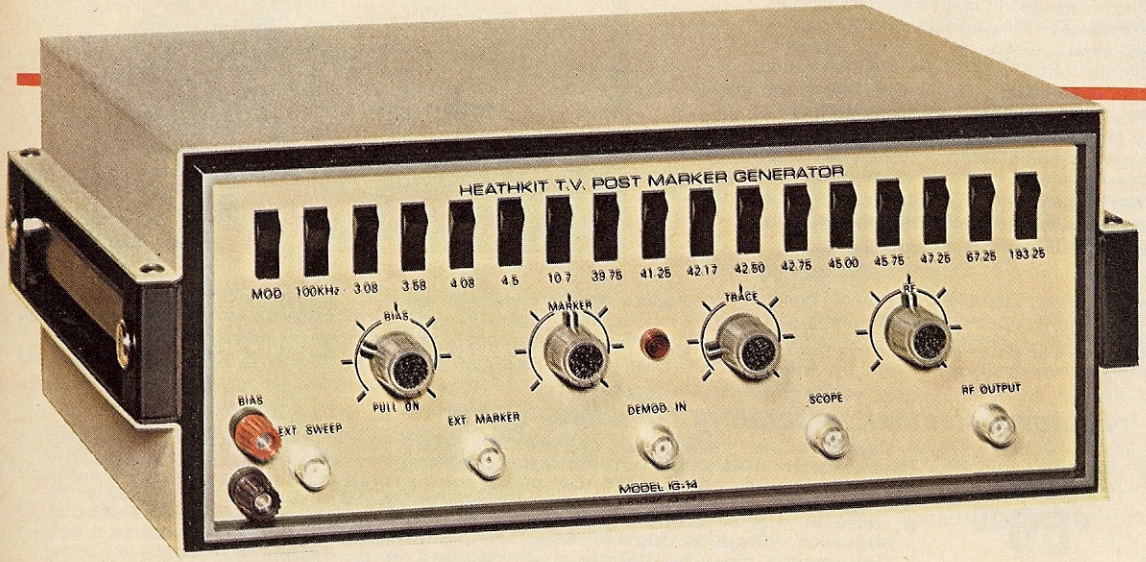
Wired IGW-57
$199.00



Easy to Build . . . everything but the switches and controls mount on three circuit boards . . . oscillator circuits are shielded.



Up to 6 Markers Simultaneously on your 'scope trace with just the IG-57 . . . no external sweep necessary.



Kit IG-14
$99.95



IG-37
$79.95

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

Value For Alignment & Trouble-Shooting

New Heathkit IG-57 Solid-State Post Marker/Sweep Generator . . . the most complete, the most essential instrument for critical Color TV and FM alignment . . . now you can afford to make bandpass alignment a regular part of checkout procedure

• This new generator plus a 'scope is all you need . . . no external sweep generator required • Comprehensive manual tells how to align Color TV, B&W TV, and FM sets • Produces all the most-used alignment frequencies for TV IF bandpass (color & b&w), TV color bandpass, FM, IF, VHF channels 4 and 10 • Post-injection marker circuitry • 15 crystal-controlled markers • Variable DC Bias supply isolated from ground for use as positive or negative bias . . . a unique design • Three sweep oscillators cover five most-used frequency ranges • Saturable reactor for linear, stable sweep signal • Switchable retrace blanking for convenient base line for trace . . . eliminates guesswork in setting phase control • Adjustable phase control permits matching generator to any 'scope • Unique trace-reverse function for proper display of trace . . . low freqs. to the left, high freqs. to the right • Built-in 400 Hz generator modulates all markers for easiest trap alignment • Zener regulated power supply • External attenuator with 7 shielded switches provide 1, 3, 6, 10, and 20 dB steps up to 70 dB attenuation • BNC connectors • 27 silicon transistors, 5 diodes, 2 Zener diodes • 3 modern circuit boards • 5 shielded cables plus 2 sets of test leads, all in kit form, complete with cable, connectors, plugs • Includes demodulation probe at no extra cost • Save hundreds of dollars with this versatile new generator

EASY TO USE. Just push a button to select any of 15 crystal-controlled marker frequencies (you can view up to six different frequencies on one 'scope trace) . . . select the sweep frequency range . . . and you are ready to instantly see the results of any adjustments you make and at what frequency a change occurs. Fast, accurate alignment.

15 CRYSTAL-CONTROLLED MARKERS. 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 plus markers for channel 4 and channel 10 picture and sound carriers for checking tuner RF response. On one trace display you can check picture and sound carriers, 6 dB points, corner marker and trap frequencies.

3 SWEEP OSCILLATORS . . . in stable Colpitts circuits produce 5 ranges, using harmonics . . . 2.5 to 5.5 MHz for color bandpass . . . 10.7 MHz for FM IF . . . 38 to 49 MHz for color and B&W IF bandpass . . . 64 to 72 MHz for VHF channel 4 . . . and 192 to 198 MHz for VHF channel 10. All linear and stable due to the saturable inductor design. In effect, the IG-57 eliminates the need for an external sweep generator, but does not obsolete your present equipment . . . the post marker section may also be used with external generators, thus making it even more versatile.

EASY TO BUILD. The new Heathkit IG-57 is a pleasure to build . . . everything mounts on three circuit boards, even the crystals . . . you'll complete it in about 25 hours . . . and save hundreds of dollars.

PUT FULL ALIGNMENT FACILITIES IN YOUR SHOP. Full performance of any TV receiver can be realized only through proper alignment. With the IG-57 you'll get top performance from receiver front-ends, the best bandpass adjustment for clear, detailed pictures with best color . . . and a reputation for good work. Order the IG-57 now.

Kit IG-57, 14 lbs., no money dn., $13 mo. **$135.00**
Assembled IGW-57, 11 lbs., no money dn., $19 mo. **$199.00**

IG-57 SPECIFICATIONS—Marker frequencies: 100 kHz. **Marker frequencies, crystal-controlled:** 3.08, 3.58, 4.08, and 4.50 MHz ± .01%. 10.7, 39.75, 41.25, 42.17, 42.50, 42.75, 45.00, 45.75, 47.25, 67.25, and 193.25 MHz ±.005%. **Modulation frequency:** 400 Hz. **Input impedance:** External Marker, External Sweep, and Attenuator—75 ohms. Demod in—220 k ohms. **Output impedances:** Marker Output, Sweep Output, and Attenuator—75 ohms. Scope Vert.—22 k ohms. **Bias voltage:** Positive or negative 15 volts DC at 10 milliamperes. **Type of marker:** Birdie. **Controls:** Bias control with pull-on/push-off switch; Marker/Trace—dual concentric; Sweep Width/Sweep Center—dual concentric; Marker Out—concentric with Sweep Range switch; and Phase. **Switches:** Rocker type—separate switch for each of the above listed frequencies; Blanking, On/Off; Trace Reverse; Modulation On/Off. **Transistor—diode complement:** (19) 2N3692 transistors; (7) 2N3393 transistors; (1) 2N3416 transistor; (3) silicon diode rectifiers; (2) crystal diodes; (1) 13.6 volt zener diode; (1) 20 volt zener diode. **Sweep frequency ranges and output voltage:** LO Band—2.5 to 5.5 MHz ±1 dB at 0.5 volts RMS (min.) fundamentals, and 10.7 MHz on harmonics. IF Band—38 to 49 MHz ±1 dB, at 0.5 volts RMS (min.) fundamentals. RF Band—64 to 72 MHz ±1 dB at 0.5 volts RMS (min.) fundamentals and 192 to 198 MHz on harmonics. **Attenuator:** Total of 70 dB of attenuation in seven steps—1 dB, 3 dB, 6 dB, 10 dB, 10 dB, 20 dB and 20 dB. **Power requirements:** 120 volts, 60 Hz AC at 20 watts.

Heathkit IG-14 Solid-State Post-Marker Generator . . . the same as the IG-57 above except without sweep generator to permit use of your present equipment

• 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

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.

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, 11 lbs., no money dn., $10 mo. **$99.95**

IG-14 SPECIFICATIONS—Crystal Marker Frequencies: 3.08, 3.58, 4.08, 4.5 MHz @ .01%; 10.7, 39.75, 41.25, 42.17, 42.50, 42.75, 45.00, 45.75, 47.25, 67.25, and 193.25 MHz @ .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.

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

ALL THE SIGNALS YOU NEED FOR FAST, EASY ALIGNMENT OF FM/FM STEREO EQUIPMENT. There's an audio or composite stereo signal for multiplex adapter adjustments . . . an RF carrier modulated by these signals for tuner and receiver adjustments . . . a "phase test" function for accurate adjustment of sub-carrier transformers . . . a variable level crystal-controlled 19 kHz (±2 Hz) pilot signal to check the lock-in range of stereo receivers . . . and built-in sweep and marker signals for overall RF and IF alignment. Carrier signal is adjustable up to 2 MHz above or below its normal frequency to permit alignment on a clear portion of the FM band.

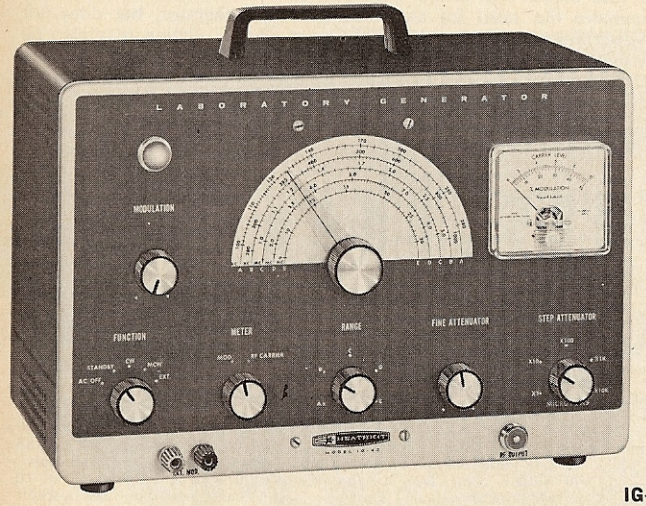
NEW FRONT PANEL & CONTROLS ARE "HUMAN ENGINEERED" AND "TECHNICIAN PROVEN" FOR MAXIMUM UTILITY. Select either right or left channel signals or the special "phase test" from the front panel—no balancing required for equal right and left channel modulation level. Provides switch-selected frequencies, either direct or modulated RF, of 400 Hz, 1000 Hz, 5000 Hz, 19 kHz, 38 kHz, and one of two special SCA (subscription service) frequencies (65 kHz or 67 kHz), to provide a versatile system for aligning even the most advanced-design tuners. Complete with leads.

Kit IG-37, 12 lbs., no money dn., $8 mo. **$79.95**

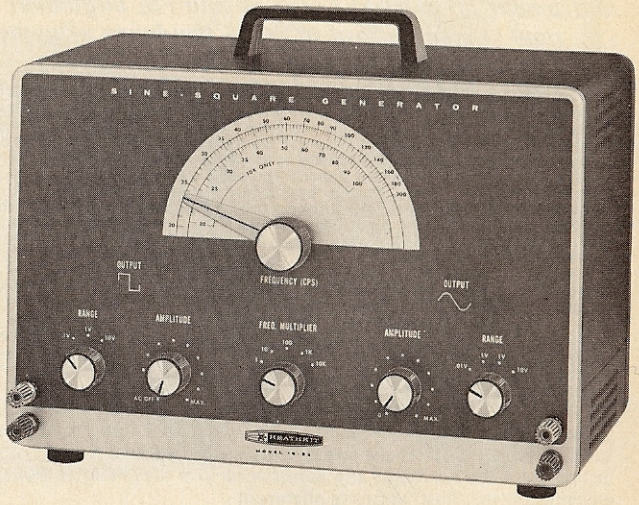
IG-37 SPECIFICATIONS—RF Signal frequency: 100 MHz adjustable by approx. ±2 MHz. **Pilot modulating frequency:** 19 kHz ±2 Hz. **FM Modulation:** Left channel (stereo), right channel (stereo), Phase Test (left plus right channel in phase), Monophonic FM. **Deviation:** Adjustable to 75 kHz. **Sweep rate:** (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:** 5½" H x 9" D x 13½" W.

Heath Has The World's Largest Selection Of Electronic Kits—Over 300 To Choose From

Heathkit® Signal Generators...



IG-42
$59.00



IG-82
$53.95

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 ±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 ±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 ±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, OB2. **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:** (±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.) ±5% 0 to 10 volt, 0 to 1 volt, 0 to .1 volt, into a high impedance load. **Source impedance:** (±10%): 10 volt range, 0 to 220 ohm; 1V and .1V ranges, 52 ohm. **Rise time:** less than .15 microsecond. **GENERAL: Frequency accuracy:** ±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.

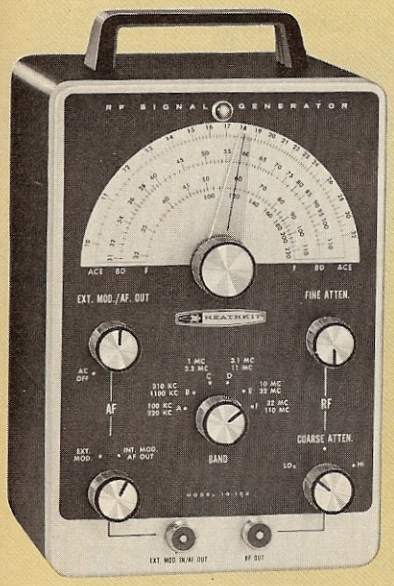
IT-12 SPECIFICATIONS—Power supply: Transformer operated. **Power requirements:** 117 volts 50/60 Hz AC, 25 watts. **Tube complement:** 12AX7, 12CA5, 1629. **Speaker:** 3½" PM. **Probe and test leads:** 4' input lead for RF and audio with switch on probe body, 2-3' panel test leads with alligator clips. **Dimensions:** 4½" W x 7½" H x 4" D.



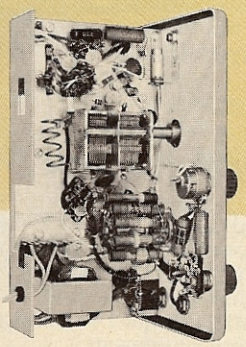
IT-12
$22.50

Use Heath's Free Technical Consultant Service—Write Them On Any Kit Subject

Used In Thousands Of Labs And Shops



Kit IG-102
$29.95

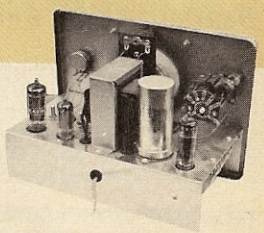


Factory Aligned Coil And Bandswitch Assembly . . . assures accurate tuning calibration.



Kit IG-72
$44.50

Wired IGW-72
$64.95



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

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

• Covers 100 kHz to 220 MHz in six bands • Large accurately calibrated dial scales • Factory wired and aligned coil and bandswitch assembly • Modulated or unmodulated RF output • 400 Hz signal modulation and 400 Hz audio output for audio tests • High-level "RF Direct" output on Berkeley Physics Laboratory version

WIDE TUNING RANGE AND ACCURATE FREQUENCY CALIBRATION HAVE MADE THE IG-102 WIDELY IMITATED . . . and widely chosen too! The versatility and accuracy of this instrument, plus its low price, have put it into thousands of service shops and laboratories the world over. The value of a wide range test instrument and the additional manual entitled "How To Understand And Use Your Signal Generator" (see page 31) have caused the IG-102 and its sister the IGW-102S to be chosen by literally thousands of educational institutions, as well. Check the specifications. Chances are the IG-102 is the instrument you require.

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

WIRED BERKELEY PHYSICS LABORATORY VERSION (IGW-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 . . . Bar None!**

Kit IG-102, 7 lbs., no money dn., $5 mo. **$29.95**
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 uV. **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:** 6½" W x 9½" 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 ±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 ±5% accuracy of metered output level and switch-selected frequencies from 10 Hz to 100 kHz. Those are the hard and fast specifications of the IG-72. Here is an excellent instrument for R & D work where a low-distortion sinusoidal signal source is required. Switch-selected frequency control saves valuable time, lets engineers flick to the desired frequency without hairline adjustments. First and second digits and multiplier are switch selected from 10 Hz to 100 kHz (Tuning accuracy is specified from 10 Hz . . . distortion percentage from 20 Hz), and the output attenuator is switch selected in 10 dB steps with vernier adjustment on each range. An ideal instrument for production quality control.

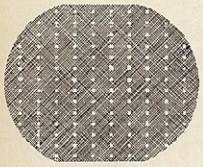
HOW CAN A KIT BE A PRECISION INSTRUMENT? . . . many of our potential customers ask. Very easily! . . . if the circuit is designed through careful "know-how" and meticulous testing . . . if durable, precision components are chosen from well-known manufacturers . . . if the layout of components is designed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

Kit IG-72, 8 lbs., no money 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.

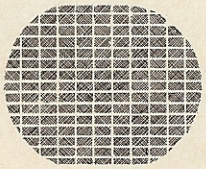
IG-72 SPECIFICATIONS—Frequency: 10 Hz to 100 kHz, switch selected, 2 significant figures and multiplier. **Output:** 6 ranges 0 to .003, .01, .03, .1, .3, 1 volts RMS into external 600 ohm load or with internal load into Hi-Z, 2 ranges 0 to 3, 10 volts RMS into a minimum of 10,000 ohms, —60 dB to +22 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:** 9½" W x 6½" H x 5" D.

TEST INSTRUMENTS

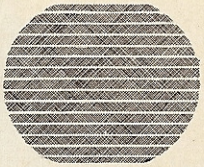
Save Up To 50% On Instruments



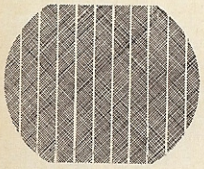
Dot Pattern



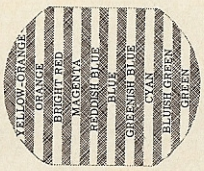
Cross-hatch



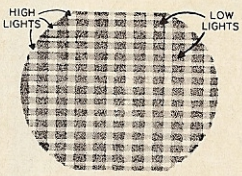
Horizontal Bars



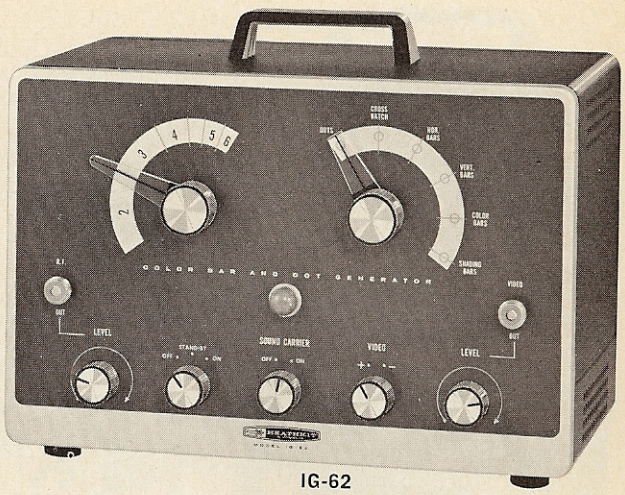
Vertical Bars



Color Bars



Shading Bars



IG-62

$67.50

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 8½" H x 7" D.



IG-52

$69.95

• Complete 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.

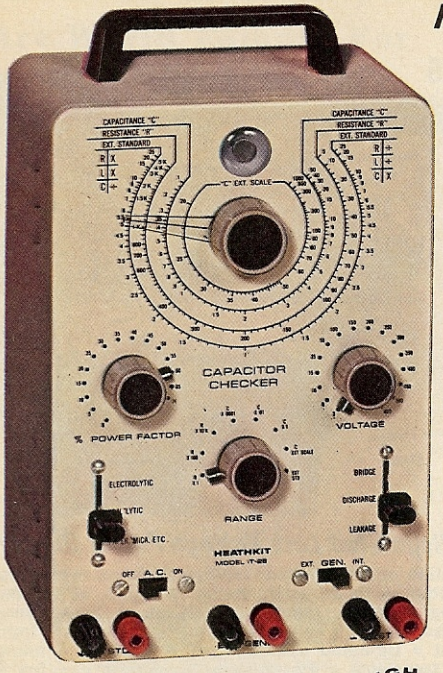
Kit IG-52, 14 lbs. . . no money down, $7 mo. **$69.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

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 8½" H x 7" D.

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

For Alignment & Trouble-Shooting

HEATHKIT®



IT-28
$31.95

THROUGH HEATH NEW RESEARCH

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

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

FAST, EFFICIENT AND ACCURATE . . . The IT-28 has everything you need to do a complete analysis of any capacitor. Measure capacitance from 10 pF to 1000 uF in four switched ranges, using the eye tube as a null indicator. Read value from the calibrated scale directly—no figuring to do. Measure leakage in three sensitivity ranges: 2 mA for electrolytics; 15 uA for miniature transistor type electrolytics and 2 uA for paper, mica, ceramic, etc., 18 switch-selected leakage voltages—from 3 to 600 VDC. Features a low voltage bridge—no danger of damaging low voltage miniature electrolytics.

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

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

Kit IT-28, 7 lbs., no money dn., $5 mo. **$31.95**

IT-28 SPECIFICATIONS—Test Circuit: AC bridge, powered through special bridge transformer by the 50/60 Hz supply or by an external audio generator with 10 volts output. Upper frequency limit: 10 kHz. **Capacitance:** 4 Ranges: 10 pF to .005 uF; .001 uF to .5 uF; .1 uF to 50 uF; 20 uF to 1000 uF. **Capacitor leakage:** DC test voltages from 3 to 600 volts in 16 steps. **Resistance:** 3 Ranges: 5 ohms to 5000 ohms; 500 ohms to 500 K ohms; 50 K ohms to 50 megohms. **Comparator circuit:** External standard R, L, or C; Max. Ratio 25-1. **Power supply:** Transformer-operated, half-wave rectifier. **Power requirements:** 105-125 V or 210-250 V AC, 50/60 Hz, 30 watts. **Dimensions:** 9½" H x 6½" W x 5" D.



Kit IM-12
$65.00

Wired IMW-12
$115.00

Heathkit Harmonic Distortion Meter

• Measures harmonic distortion as low as 1% full-scale reading • Frequency range–20 to 20,000 Hz • Meter scales calibrated in volts RMS, % distortion, and dB • Measures noise levels down to –60 dBm • Quality components for precision measurements • Easy assembly & operation • Full instructions included

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 dn., $7 mo. **$65.00**
Assembled IMW-12, 13 lbs., no money dn., $11 mo. **$115.00**

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, ±5%; Distortion, ±5% of full scale, +0.1% distortion. **Tube complement:** OA2, 6X4, 5879, 12AT7, 12AX7, 12BY7. **Power requirement:** 105-125 V. 50/60 Hz AC, 30 watts. **Dimensions:** 13" W x 8½" H x 7" D.

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 dn., $7 mo. **$69.00**
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 50 kHz ±1 dB. **I.M. Analyzer high pass filter:** 2000 Hz to 12,000 Hz. **I.M. Analyzer low pass filter:** 10 Hz to 600 Hz. **AC VTVM Range:** .01, .03, .1, .3, 1, 3, 10, 30, 100, 300 volts RMS full scale. **dBm:** —40, —30 —20, —10, 0, +10, +20, +30, +40, +50. Reads from —65 to +52 dBm. **Wattmeter:** 0.15 mW, 1.5mW, 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. Analyer:** 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 8½" H x 7" D.



IM-22
$69.00

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

"Performance-Plus" Heathkit® Test Equipment

New Low Cost Heathkit 1-15 VDC Solid-State Power Supply . . . Ideal For Transistor Circuitry Experimentation & Servicing

• Voltage regulated • Adjustable current limiting Output up to 500 mA continuous at 1-15 v. • AC and DC programming • "Floating" output for either + or — ground • All silicon transistors • Circuit board construction • Compact fit-anywhere size • So low in cost you can afford one for positive supply, one for negative supply

THE IDEAL POWER SUPPLY FOR ANYONE WORKING WITH TRANSISTORS. Whether you work in a laboratory designing transistor circuits, enjoy experimenting with solid-state circuits in your home workshop or service transistor equipment, the new Heathkit IP-18 is the power supply for you. Here in one compact design is a solid-state supply with voltage regulation, adjustable current limiting, AC or DC programming, and the correct output voltages, all at a remarkably low cost.

Kit IP-18, 5 lbs. **$19.95**

IP-18 SPECIFICATIONS—Voltage output: 1-15 VDC, continuously adjustable. **Load regulation:** Less than 50 mV variation from no load to full load. **Line regulation:** Less than 50mV change in output voltage for a 10% change in line voltage. **Ripple and noise:** Less than 5 mV. **Current output:** 500 mA maximum continuous load. **Current limiting:** Adjustable from 10 mA to over 500 mA. **Transient response:** 25 microseconds. **Output impedance:** .5 ohm or less to 100 kHz. **Power requirements:** 105-125 or 210-250 VAC, 50/60 Hz, 15 watts at full load. **Dimensions:** 5½" W x 4⅜" H x 5¾" D. **Net weight:** 3¼ lbs. **Programming:** AC or DC, 5000 ohm input resistance.

IP-18

$19.95





Kit IP-27 **$76.95**

Wired IPW-27 **$119.95**

Heathkit Solid-State Regulated Low Voltage Power Supply

• 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 • Zener reference-voltage power supply • All calibration controls accessible from "outside" the instrument • 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

Kit IP-27, 16 lbs., no money dn., $8 mo. **$76.95**
Assembled IPW-27, 14 lbs., no money dn., $11 mo. **$119.95**

IP-27 SPECIFICATIONS—Input: 105-125 or 210-250 VAC, 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:** For 10% change in line voltage. Less than .05% change. **Ripple & noise:** Less than 1.50 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:** 3½", 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:** 5⅛" H x 13¼" W x 9" D.



Kit IP-17 **$59.95**

Wired IPW-17 **$89.95**

Heathkit Regulated High Voltage Power Supply

• Heathkit instrumentation styling • Unitized construction • Circuit board-wiring harness construction • 6 & 12 VAC filament voltages • B+ from 0 to 400 VDC, Bias from 0 to —100 VDC • Separate meters for B+ output voltages & current • Voltmeter switched to read C— volts

Kit IP-17, 21 lbs., no money dn., $6 mo. **$59.95**
Assembled IPW-17, 19 lbs., no money dn., $9 mo. **$89.95**

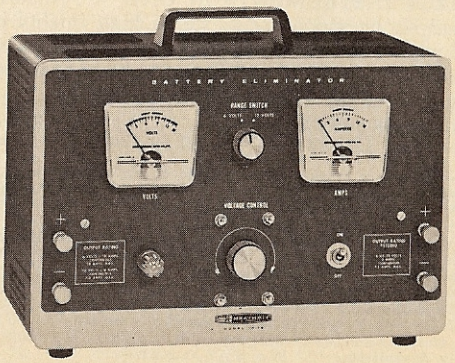
IP-17 SPECIFICATIONS—Output: 0-400 volts regulated DC at 0-100 mA cont., 125 mA intermittent, 0 to —100 volts DC at 1 mA variable bias voltage, 6.3 volts AC at 4 amps., 12.6 volts at 2 amps. (25 VA max. AC load), filament voltage. **Regulation:** Output variation less than 1% from no load to full load. Output variation less than 1% for a ±10 V change at 117 V AC input. **Ripple:** Less than 10 millivolts RMS, ripple, jitter and noise. **Output impedance:** Less than 10 ohms, DC to 1 MHz. **Meters:** Voltmeter 0-400 V or 0-150 V.; Milliammeter 0-150 mA. **Power requirements:** 105-125 or 210-250 VAC, 50/60 Hz, 150 watts max. **Dimensions:** 5⅛" H x 13¼" W x 11" D.

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

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.

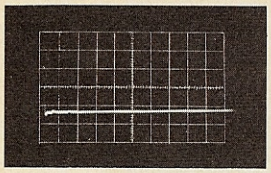
IP-12 SPECIFICATIONS—Continuously variable output: 6 volt range: unfiltered, 10 amp continuous, 15 amp maximum; filtered, 5 amp continuous, less than .3% ripple. 12 volt range: unfiltered, 5 amp continuous, 7.5 amp maximum; filtered, 5 amp continuous, less than .3% ripple. **Power requirements:** 105-125 volts 50/60 Hz AC at 200 watts. **Dimensions:** 13" W x 8½" H x 7" D.

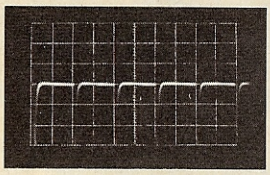


Kit IP-12 **$49.50**

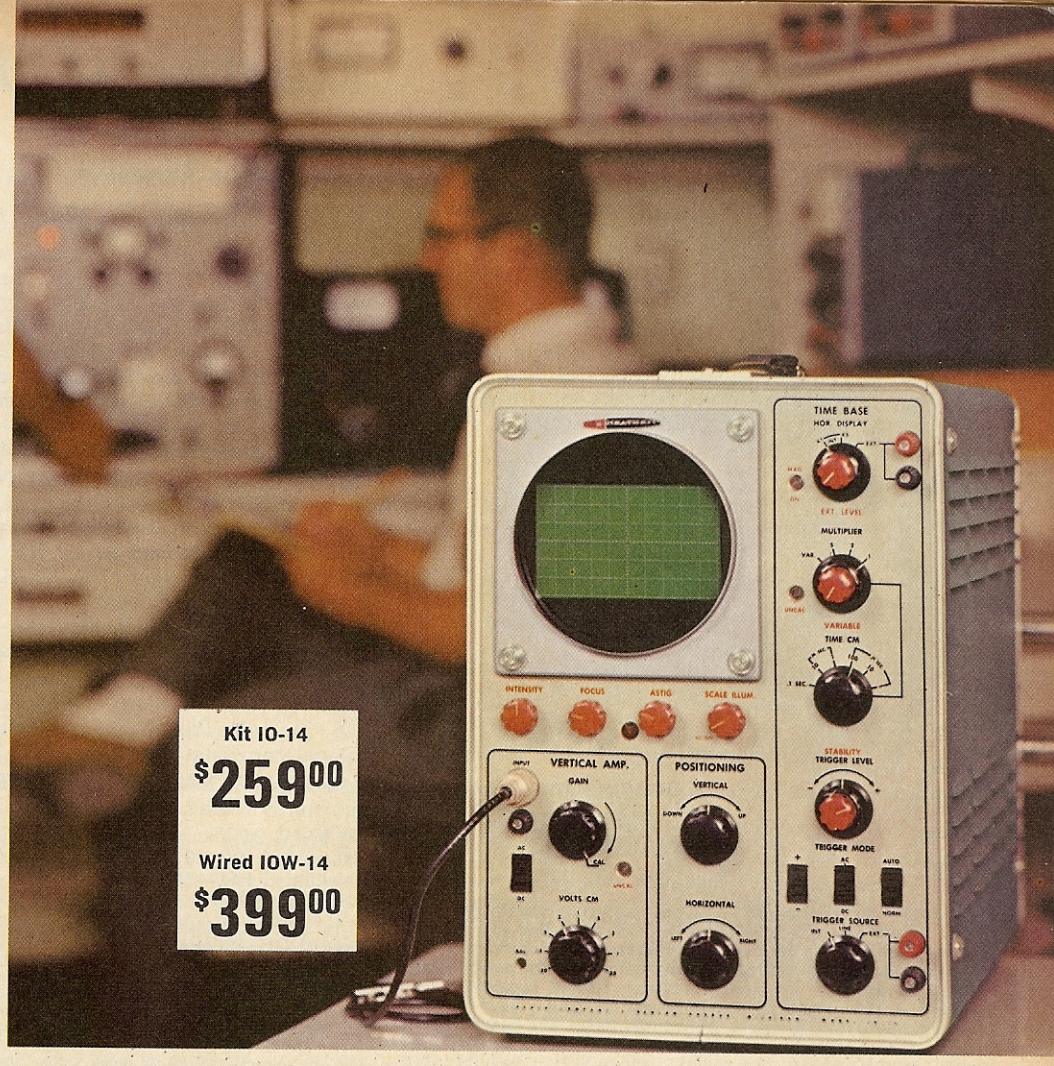
Save Up To 50% With Heath Do-It-Yourself Electronic Kits

Heathkit® Oscilloscopes Are World Famous For High Quality At Low Cost





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 Telequipment® Type C-1 scope calibrator. Scope sensitivity for both waveforms is 0.2 volts/cm.



Heathkit IO-14 Triggered-Sweep, Delay Line DC Scope . . . The Value And Performance Standard Of The Industry

• A high stability 5" DC oscilloscope with triggered sweep • DC to 8 MHz bandwidth and 40 nanosecond rise time • Vertical signal delay through high linearity delay lines • Calibrated vertical attenuation • Calibrated time base • Forced air cooling • Input for Z axis modulation • Input for direct access to vertical deflection plates • Fulfills many production and laboratory requirements at far less cost than comparable equipment–particularly scopes capable of fast-rise waveform analysis • No special order for export version required–wiring options enable 115/230 volt, 50-60 Hz operation

HERE IS A TRULY SOPHISTICATED INSTRUMENT . . . capable of satisfying the most critical demands for performance. The IO-14 features precision delay-line circuitry to allow the horizontal sweep to trigger "ahead" of the incoming vertical signal. This allows the leading edge of the signal waveform to be accurately displayed after the sweep is initiated. What is more, the IO-14's delay line is capable of reproducing sharp rise time signals far beyond the high frequency limitations of the oscilloscope. This assures the utmost ability for critical analysis of signal waveform characteristics . . . right up to the limits of the published specifications.

FEATURES YOU'D EXPECT ONLY IN HIGH PRICED SCOPES. For example, a calibrated vertical attenuator, a 5x sweep magnifier, and a magnifier indicator lamp . . . external sweep input and external trigger input . . . and many others, including an accurately engraved graticule with variable intensity lighting for optimum results in 'scope photography.

PRECISION PARTS USED THROUGHOUT. Switches are quality, ball-detent type. All major control potentiometers are precision, high-quality sealed components. All critical resistors are 1% precision. And circuit boards are low-loss fiberglass laminate.

CIRCUIT BOARDS & WIRING HARNESS ASSEMBLY . . . make building the IO-14 a real pleasure. Alignment requires an accurate voltmeter, an accurate, fast rise time square wave generator, and a sine wave signal source.

FOR PHYSIOLOGICAL OR BIOLOGICAL STUDY . . . the IO-14 is available in assembled form with a long-persistence CRT (P7 phosphor)—the IOW-14S. 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.

Kit IO-14, 53 lbs., Express or Motor Freight, no money dn., $24 mo. **$259.00**

Assembled IOW-14, 47 lbs., Express or Motor Freight, $40 dn., as low as $23 mo. **$399.00**

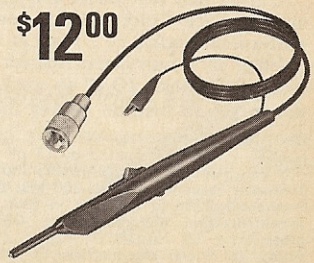
Assembled IOW-14S (with P7 phosphor), 47 lbs., Express or Motor Freight. **$410.00**

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.

Low Capacitance Scope Probe . . . Factory Assembled

PKW-2

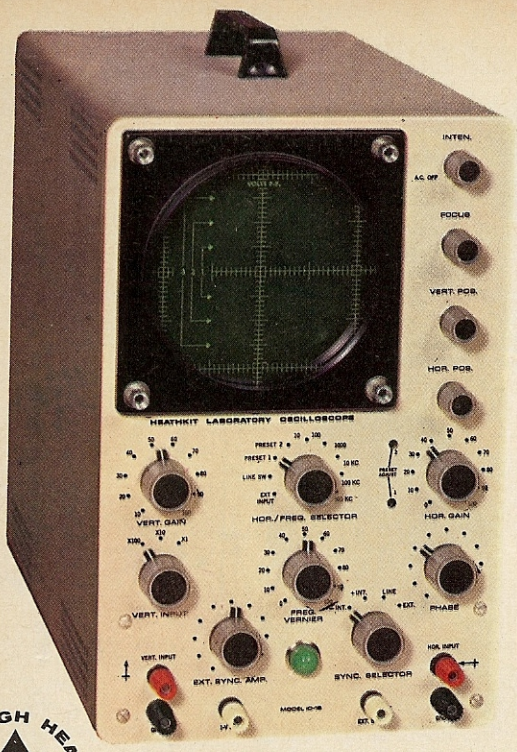
$12.00



PKW-2 PROBE MINIMIZES CIRCUIT LOADING & SIGNAL DISTORTON . . . designed for scopes with 1 megohm input, such as Heathkit IO-14. Features miniature switch for x1 or x10 attenuation. Impedance in x1 position is 1 meg shunted by 110 pF . . . 10 meg shunted by 20 pF in x10 position. Response is DC to 25 MHz. Max. DC voltage is 600 V. Features spring-loaded clip tip for hands-free operation.
Wired PKW-2, 1 lb. **$12.00**

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

Heathkit® Oscilloscopes For



THROUGH HEATH NEW RESEARCH

Wired IOW-18
$139.95

Introducing the Heathkit "Extra Duty" Wide Band 5" Scope . . . Peak Performance, Versatility & Value

THE HEATHKIT IO-18 shares the enviable heritage of the all-time value favorite of the industry—the IO-12, which is being used in thousands of service shops, prefessional and educational laboratories, industries and home test benches all over the world. And Heath engineers have added a few extras too . . . like the new look of Heathkit instrumentation . . . new Heathkit knobs which are easier to grasp and new pointers and markings for quick, accurate reading. The IO-18 also can be wired for either 120 volt or 240 volt use and a 3-wire line cord with grounded cabinet is standard.

CHOSEN FOR THE BERKELEY PHYSICS LABORATORY. Factory assembled version IOW-18S is part of the Basic Instrument Group of Heath instrumentation for the Berkeley Physics Laboratory. Special provisions on this scope are two banana jacks connected to the HV & horizontal sweep voltage . . . otherwise all specifications are identical to IO-18.

A DEPENDABLE INSTRUMENT THROUGH QUALITY ENGINEERING . . . Excellent linearity and lock-in characteristics assure stable waveform presentations even at upper frequency limits. Peak-to-peak voltage calibration reference adds extra convenience. Wide band amplifiers and wide range sweep frequencies make the IO-18 ideal for many specialized as well as general investigations. The two "pre-set" sweep frequency choices are a valuable aid in servicing the vertical and horizontal circuits in television receivers.

RATED FOR PROFESSIONAL USE . . . the husky, well-rated power supply and sturdy chassis assure you years of dependable performance.

Kit IO-18, 24 lbs. . . no money dn. . . $9 mo. **$84.95**
Assembled IOW-18, 23 lbs. . . no money dn. . . $13 mo. **$139.95**
Assembled IOW-18S, Wired Berkeley Physics Version, 24 lbs. **$141.50**
See Page 31 for comb. offer with EF-2 Applications Course. EF-2-5. . . . . **$94.00**

IO-18 SPECIFICATIONS:—Vertical Sensitivity: 70 mV peak-to-peak per inch at 1 kHz. **Frequency Response (Referred to 1 kHz level):** ±1 dB, 8 Hz to 2.5 MHz; ±1.5 to —5 dB, 3 Hz to 5 MHz; response at 3.58 MHz —2.2 dB. **Rise Time:** 0.08 micro-seconds or less. **Input Impedance:** (at 1 kHz) 2.7 megohms at x1, 3.3 megohms at x10 and x100. **Horizontal Sensitivity:** 0.85 volts peak-to-peak per inch at 1 kHz. **Frequency Response:** ±1 dB 1 Hz to 200 kHz; ±3 dB 1 Hz to 400 kHz. **Input Impedance:** 4.9 megohms at 1 kHz. **Sweep Generator:** Range —10 Hz to 500 kHz in five steps, variable, plus any 2 switch-selected preset sweep frequencies in this range. **Synchronizing:** Automatic lock-in circuit using self-limiting synchronizing cathode follower. **Power Requirements:** 105-125 volts or 210-250 volts AC, 50-60 Hz at 80 watts, fused. **Dimensions:** 14⅛" H x 8⅝" W x 16" D.

• Bandwidth to 5 MHz for TV signal analysis • Heath patented sweep circuit—10 Hz to 500 kHz in five ranges • Two extra sweep positions which may be preset to often-used sweep rates • Frequency-compensated vertical attenuation • Built-in peak-to-peak calibration reference • Intensity-modulated Z-axis input • Retrace blanking • New Heathkit instrumentation look— easy-to-grasp knobs, quick-to-read pointers, handsome beige and black styling • Combination circuit board and wiring harness construction speeds assembly • Up to 50% savings over equivalent oscilloscopes

The Heathkit IO-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

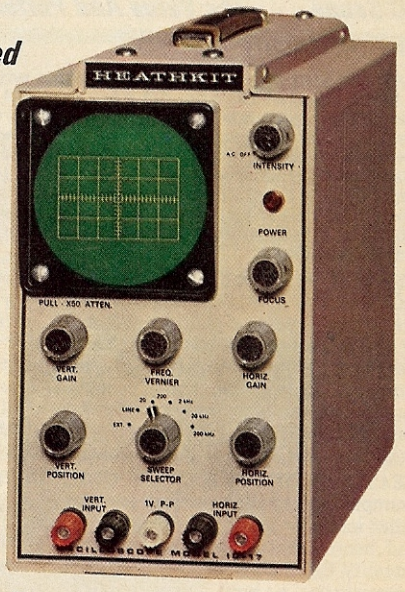
Destined To Set The Value Pace . . . the Heathkit IO-17 with its superior response and sensitivity . . . its professional features . . . compactness . . . handsome new styling . . . and low cost . . . will find its way into shops and labs the world over. The TV service man will find its extended response, 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.

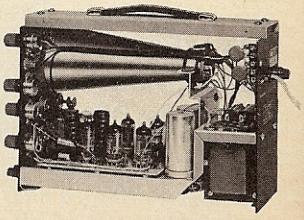
Modern Compact Styling. The new Heath instrument motif with its integrated chassis, panel design permits removal of the left and right cabinet halves for servicing without impairing its operation . . . front and rear panel and chassis as well as the top girder support with convenient handle remain in 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, 16 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) 3RP1 cathode ray tube, medium persistence, green trace; (3) 12AU7; (1) 12AX7; (1) 6GH8; (1) 6BH6; (1) 6BQ7. **Power requirements:** 105-125 or 210-240 volts 50/60 Hz. **Power consumption:** 60 watts. **Overall dimension:** 9½" H x 5½" W x 14½" L. (Dimensions include handle, knobs, etc.). **Net weight:** 12 lbs.



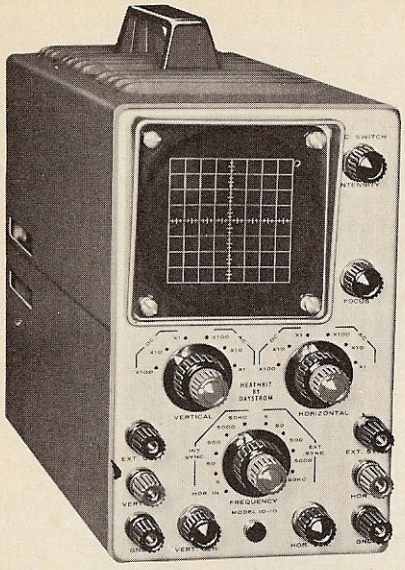
IO-17
$79.95



IO-17 Inside . . . clean, uncluttered, thanks to circuit board construction and thoughtful layout of power supply and other components. Note completely shielded CRT.

Heath Has The World's Largest Selection Of Electronic Kits—Over 300 To Choose From

Accuracy, Dependability And Value



Kit IO-10 **$99.95**

Wired IOW-10 **$169.00**

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 biomedical, 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 ¼" (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:** 8⅝" H x 4⅝" W x 13" D.



IO-21 **$61.95**

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:** 9½" H x 6½" W x 10" D.

Dual-Trace Scope Display With The Heath Electronic Switch



ID-22 **$25.95**

• Provides dual-trace scope presentation–permitting display of two separate signals on screen, appearing simultaneously through persistence of CRT phosphor • Displays signal levels as low as 0.1 volt • ±1 dB, 0-100 kHz response • Separate gain controls for each channel to prevent overdriving of the input circuits • All-electronic switching • Four switching rates–150, 500, 1500 and 5000 Hz • Position control allows superimposing or separating signals for comparison purposes • Sync output to control scope sweep

Kit ID-22, 7 lbs.,
no money dn., $5 mo. **$25.95**

Low Capacitance Scope Probe Kit



Essential in high frequency circuit work . . . minimizes loss of gain, circuit loading or distortion due to overloading scope input. Probe body switch provides direct or x10 attenuated operation and an adjustable trimmer capacitor provides proper match to scope input. Wiring options permit impedance match to 10-18 (3.3 megohms) or 10-14 (1 megohm) input.

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

Scope Demodulator Probe Kit

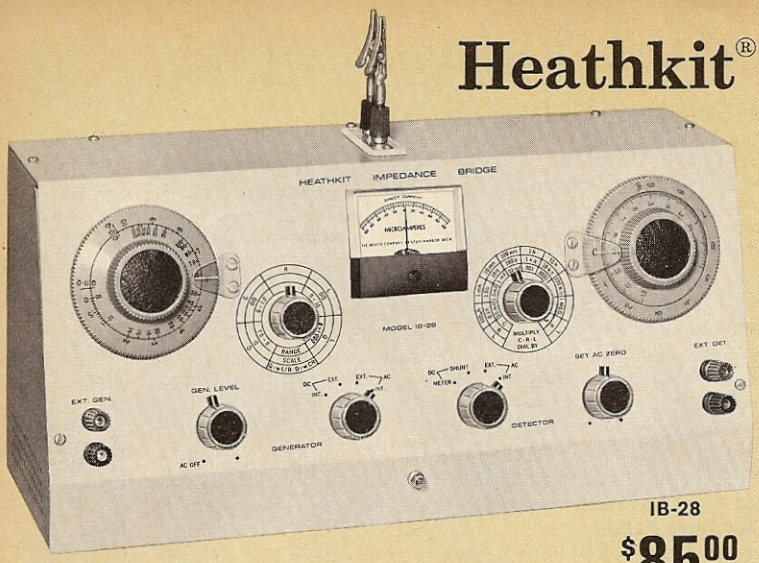


An advantage in both radio & TV servicing . . . for distortion checks and observation of modulation envelopes of RF and IF signals. Functions as an AM detector. Voltage limits are 30 volts, RMS, 500 volts DC.

Kit 337-C, 1 lb. **$4.00**
Assembled 337W-C, 1 lb. . . **$5.00**

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

Heathkit® Test And Service Gear



IB-28

$85.00

Heathkit Impedance Bridge

• Features the "New Look" of Heath instrumentation • Four separate bridge circuits to measure resistance, capacitance, low Q and high Q inductance • Easy operation and reading with the slanted control panel • Built-in generator and amplifier • Battery-type vacuum tube circuitry for fast warmup • ½% precision resistors and silver-mica capacitors for higher accuracy • Operates on 120 v. or 240 v., 50/60 Hz.

IB-28 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 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 $\mu\mu$F to 100 μF. **Inductance:** 0.1 mH to 100 H. **Dissipation Factor:** (D) 0.002 to 1. **Storage Factor:** (Q) 0.1 to 1000. **Accuracy:** ½% decade resistors used. **Tube Complement:** (2) 1U4, (2) 1L4. **Power Supply:** Transformer and silicon rectifier. **Power Requirements:** 105-125 V. or 210-250 V., 50/60 cycles, 10 watts. **Dimensions:** 8" H x 17" W x 6" D.

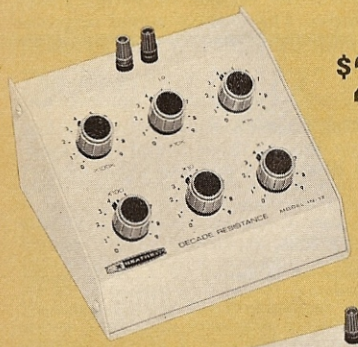
VERSATILE TESTING FACILITIES WITH LAB ACCURACY. Four popular bridge circuits are combined in this compact, easy-to-use instrument for precision tests of electronic components. There's the Wheatstone bridge for resistance measurements, the Capacitance Comparison bridge for capacitance measurements, the Maxwell bridge for low Q inductance measurements, and the Hay bridge for high Q inductance measurements.

DESIGNED FOR RAPID, ACCURATE TESTING. The IB-28 simplifies measurement of resistance, inductance, capacitance, dissipation factors of capacitors and storage factor of inductors. Clearly-identified panel controls include a two-section CRL dial with ten separate "units" setting on the outer ring and a continuously variable calibrated inner dial for reading of fractions of units. D, Q, and DQ functions are combined on one shaft for single-knob operation and to eliminate confusion or incorrect dial settings. The newly styled control knobs permit fast positive setting changes; pointers indicate settings at a glance. The attractive beige and black cabinet looks sharp on any bench.

Battery-Type Tubes. Eliminate time-consuming warmup periods . . . minimize accuracy-destroying changes in operating characteristics due to thermal effects. And the use of ½% precision resistors and silver-mica capacitors is a further assurance of continued high accuracy in all measurements.

Easy To Build—Easy To Own. The open circuit layout of the IB-28 permits construction to go quickly, with less chance of error. And the low cost puts lab testing facilities within easy reach of the service technician, radio ham or home experimenter.

Kit IB-28, 11 lbs. . . no money dn., $9 mo. **$85.00**

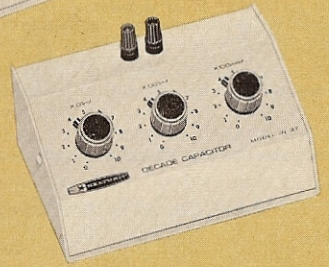


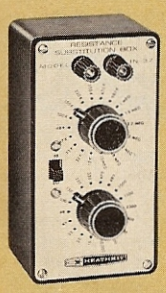
IN-17

$26.95

IN-27

$17.95







IN-47

$6.50

IN-37

$6.95

Heathkit Decade Resistance Box

FEATURES THE "NEW LOOK" OF HEATHKIT TEST INSTRUMENTATION. "New look" control knobs are positive to grasp, pointers quick to spot. And ½% resistors in six decades provide extremely accurate values from 1 ohm to 999,999 ohms in 1 ohm steps. Range switches have new silver-alloy, make-before-break contacts for smooth switching 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, ½% accuracy, 1 watt. **Minimum DC resistance:** .25 ohms or less at terminals with all sw. set at zero. **Dimensions:** 7½" W x 5" H x 6⅝" D.

Heathkit Decade Capacitance Box

ACCURATE CAPACITANCE VALUES FROM 100 pF to 0.111 uF IN 100 pF STEPS. 1% silver-mica capacitors assure you of accuracy. Ideal for use in substitution tests or comparison bridge circuits where high accuracy is desired. This precision, lab instrument features high-quality ceramic wafer switches with positive detent action. New Heathkit instrumentation styling is "human engineered" . . . newly styled control knobs; clear, distinct dial calibration; and a color scheme that makes the instruments quick to identify on a crowded service bench.

Kit IN-27, 3 lbs. **$17.95**

IN-27 SPECIFICATIONS—Range: 100 $\mu\mu$F to 0.111 μF in increments of 100 $\mu\mu$F. **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 $\mu\mu$F at terminals. **Dimensions:** 7⅛" W x 4" H x 5" D.

Heathkit Resistor Substitution Box

SUBSTITUTE COMMON RESISTOR VALUES CONVENIENTLY . . . a handy service tool, a valuable shop addition. Replace burned or unknown resistors easily, quickly. Provides switch selection of any one of 36 EIA standard 10% 1-watt resistors, ranged from 15 ohms to 10 megohms. Hi or Lo range slide switch. Case is 5⅜" L x 3⅛" W x 3" H.

Kit IN-37, 2 lbs. **$6.95**

Heathkit Capacitor Substitution Box

STYLED IN "NEW LOOK" BIEGE & BLACK. Switch select any one of 18 EIA standard capacitors (high quality silver-mica & molded tubular) from 100 pF to .22 uF. All capacitors rated at 600 V except the three lowest & two highest values, which are 500 & 400 V respectively. 18" alligator clip test leads included. Case measures 5⅜" L x 3⅛" W x 3" H.

Kit IN-47, 2 lbs. **$6.50**

Use Heath's Free Technical Consultant Service—Write Them On Any Kit Subject

Heathkit® Classroom And Laboratory Instruments



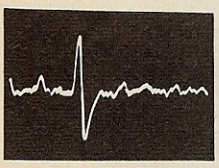
Wired EVW-3

$280.00

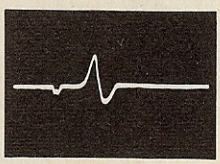
Let Students "See" Biological And Physiological Phenomena . . . With The Heathkit IMPScope

• 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 IMPS, 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

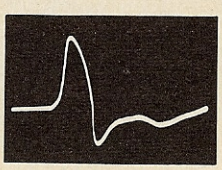
IMPScope BRINGS MODERN INSTRUMENTATION INTO YOUR CLASSROOM . . . fulfills a vital need in the teaching of life sciences. Already in use in thousands of schools, the IMPScope has proven itself easily understood—even by junior-high school students!



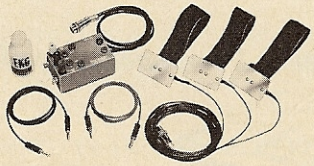
Frog EKG. IMPScope accessories include electrodes for EKG's of frogs and other organisms.



Muscle Potentials. IMPScope shows nerve and muscle action potentials (frog gastrocnemius muscle).



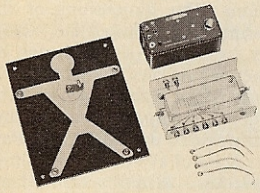
Bioelectric. IMPScope shows bioelectric phenomena in plants (175 mv action potential of Nitella internode).



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, 11½" W x 7½" H x 19½" D. **Net weight:** 17½ lbs.



IMPScope Accessories

EVW-3-1 **$50.00**

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 Classroom Device For Analog Computer Design, Physics, Engineering and Mathematics

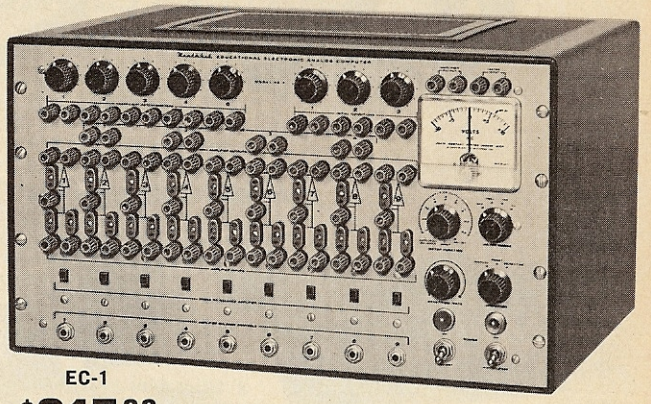
• Excellent teaching aid for a course in computer electronics • Vividly illustrates the electronic analogies to mathematical problems • Handles problems as complex as fluid flow, damped harmonic motion, and flight of a projectile in a viscous medium • 9 DC operational amplifiers • Switching allows amplifier 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

$215.00

Kit EC-1, 48 lbs. **$215.00**

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

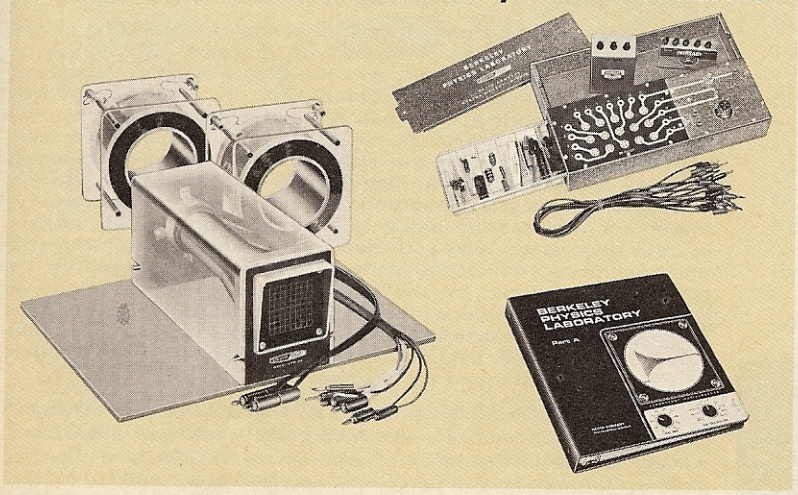
EC-1 SPECIFICATIONS—Amplifiers: Open loop gain approximately 1000. Output—40 +60 volts at .7 ma. **Power supplies:** ±300 volts at 25 ma electronically regulated, variable from +250 to +350 by control with meter reference for setting +300 volts. Negative 150 volts at 40 ma regulated by VR tube. **Repetitive 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 ua movement. **Power requirements:** 105-125 or 210-250 V., 50-60 Hz, 100 watts. **Dimensions:** 19⅝" W x 11½" H x 15" D.

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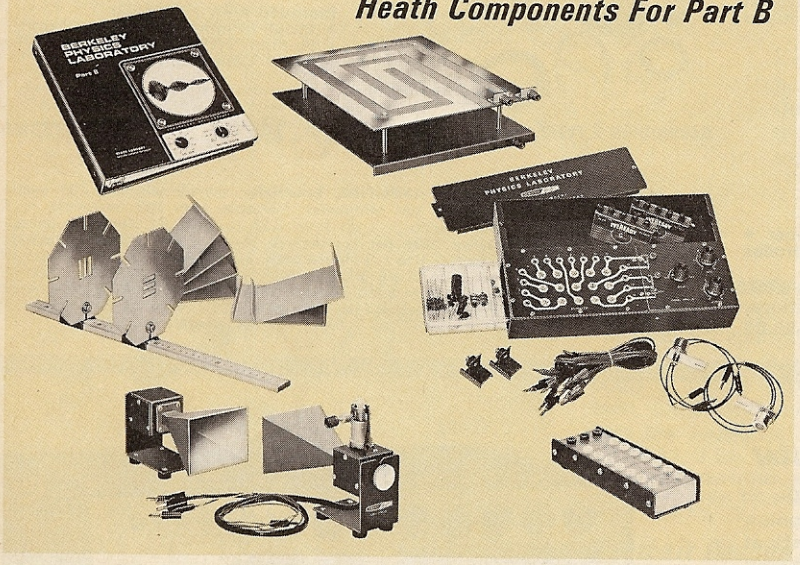
EDUCATIONAL

Heath Instruments & Components

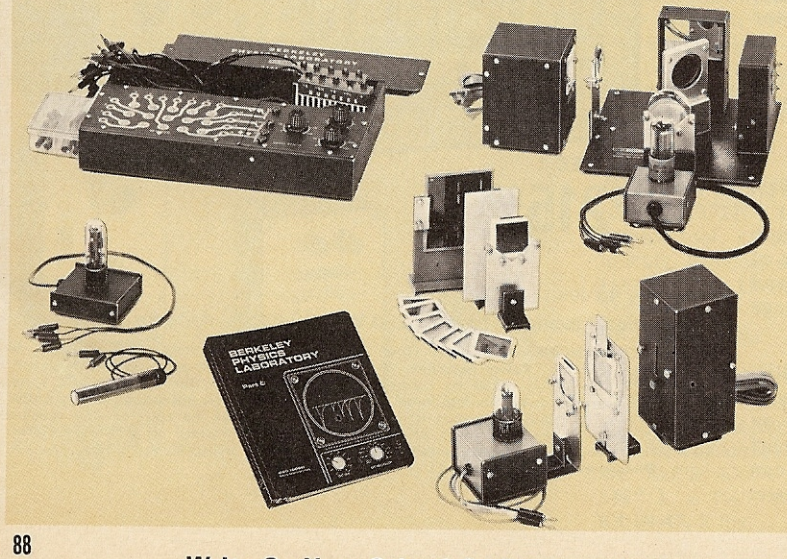
Heath Components For Part A



Heath Components For Part B



Heath Components For Part C



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, −22½, −45 volt and one 0, −1½, −3, −4½, −6, −7½ volt battery.

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 ¾ wavelength transmission line, and all necessary interconnecting wires. Lab and instrumentation manuals.

BATTERY PACK—EPA-10-2. (Two) 0, −1½, −3, −4½, −6, −7½ volt batteries.

OPTICAL COMPONENTS SET—EPW-26. 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, photomultiplier 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.

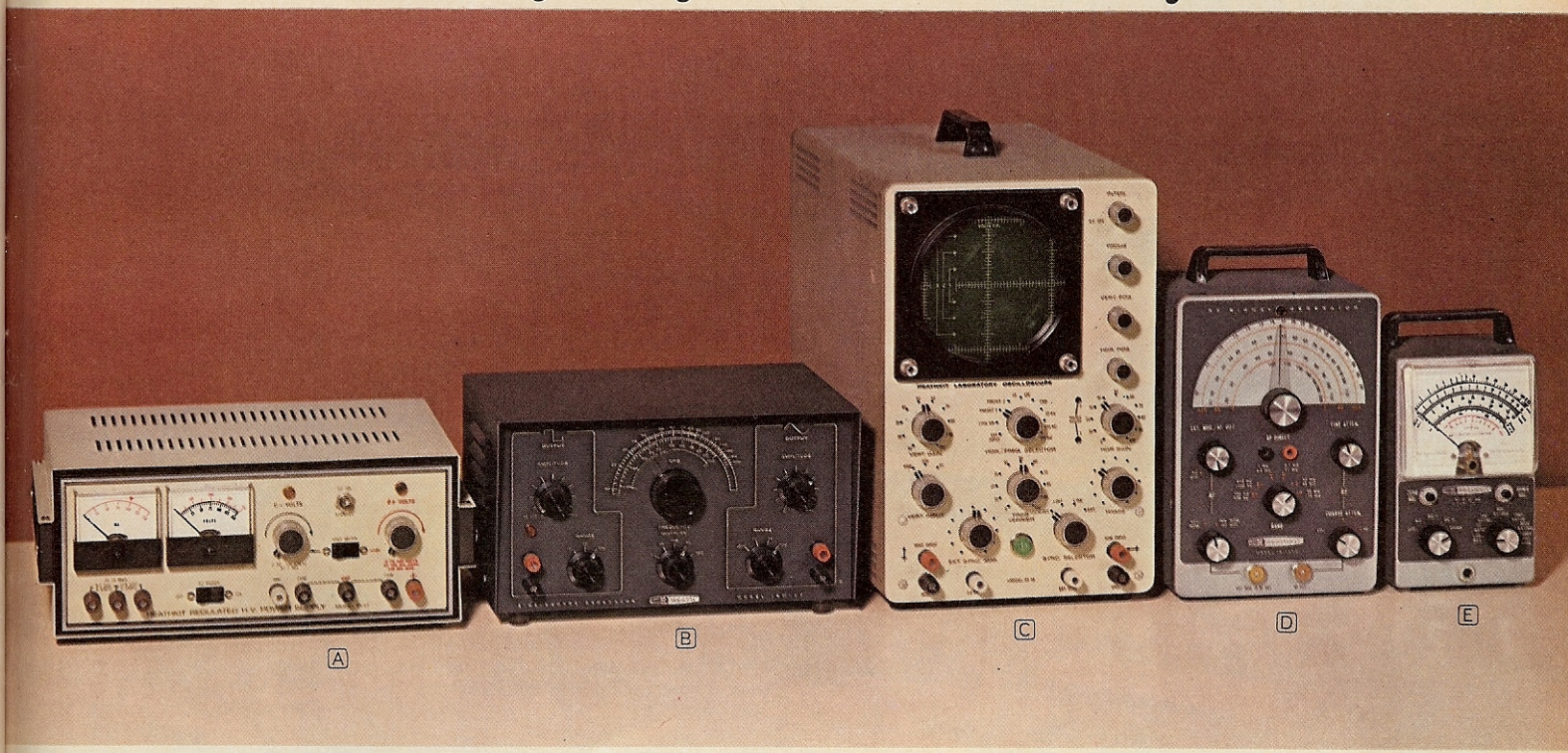
EXPERIMENT CHASSIS & SMALL PARTS—EPW-16. Experiment chassis includes same open-ended features as Parts A & B. The guard-ring diode allows easy examination of the physical processes associated with the operation of thermionic vacuum diodes. The G/M probe permits easy examination of basic principles of 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, −1½, −3, −4½, −6, & −7½ volt batteries.

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For The Berkeley Physics Laboratory



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 Berekely Physics Laboratory) the basic concepts of physics are taught through the advantages of modern instumentation 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 72	$47.95
B **IGW-47, Sine-Square Wave Generator,** see EUW-27 page 92	$94.00
C **IOW-18S, Laboratory 5" Oscilloscope,** see page 84	$141.50
D **IGW-102S, R. F. Signal Generator,** see page 79	$60.00
E **IPW-17, Regulated Power Supply,** see page 82	$89.95
EPW-100H, Basic Instrument Group	$433.40

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-100J**	$575.00

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-100K**	$615.00

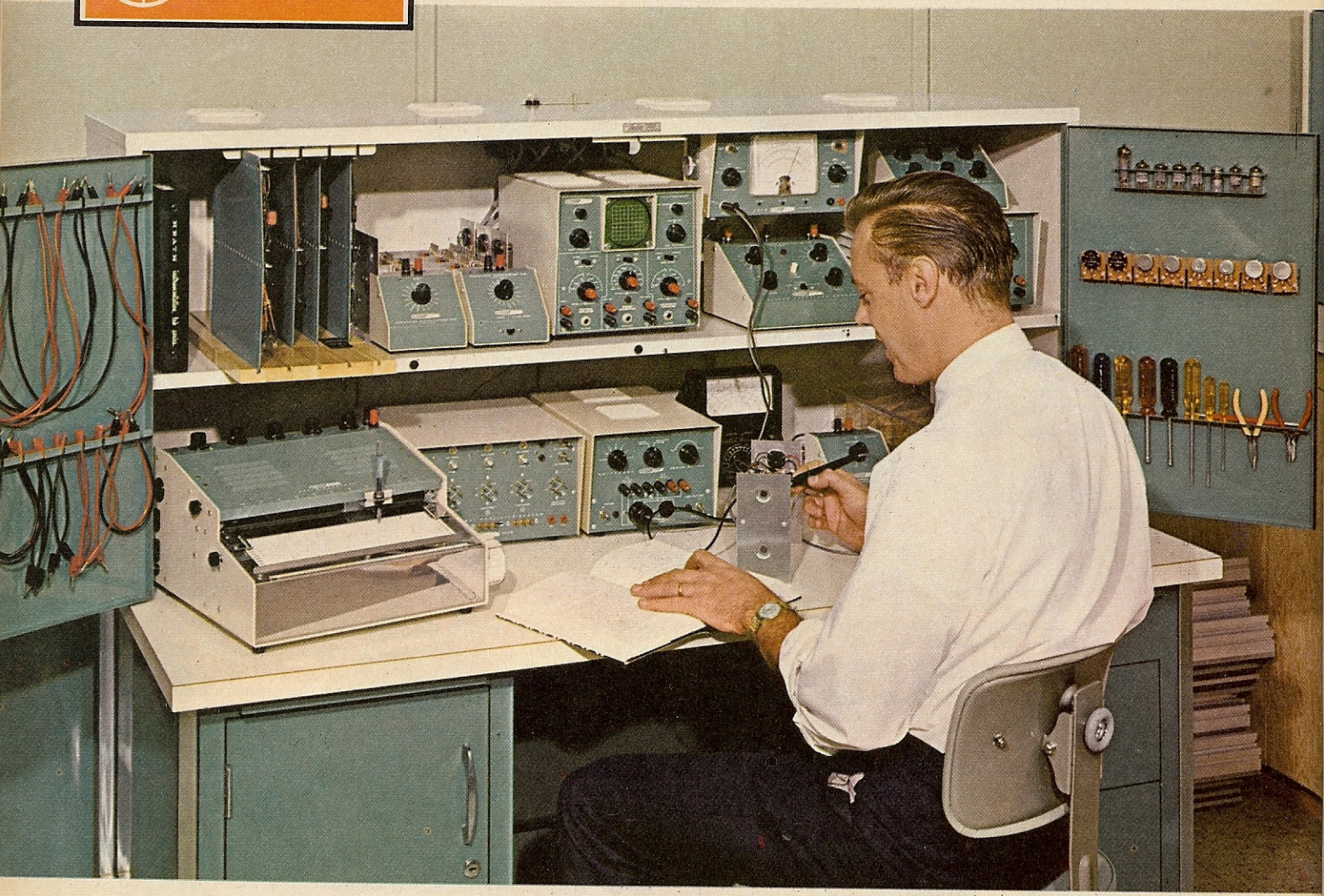
HEATH COMPONENTS FOR PART C	
EPW-16, Experiment Chassis & Accessories	$135.00
EPW-26, Optical Components Set	180.00
EPA-10-2, Battery Set	5.00
EUW-17, Transistor Power Supply	20.00
	$340.00
GROUP PRICE, PART C, Components plus instruments above. Wired **EPW-100L**	$699.00

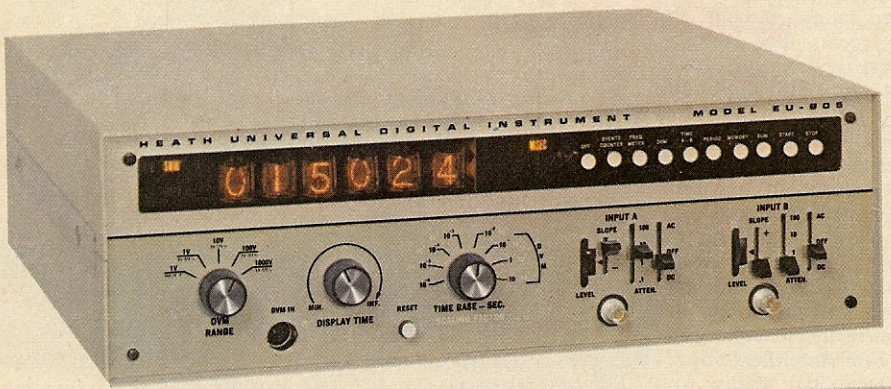
EUP-23E, Step down transformer for operating above instruments on 220 VAC, 50/60 Hz $39.95

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Heath/Malmstadt-Enke Factory

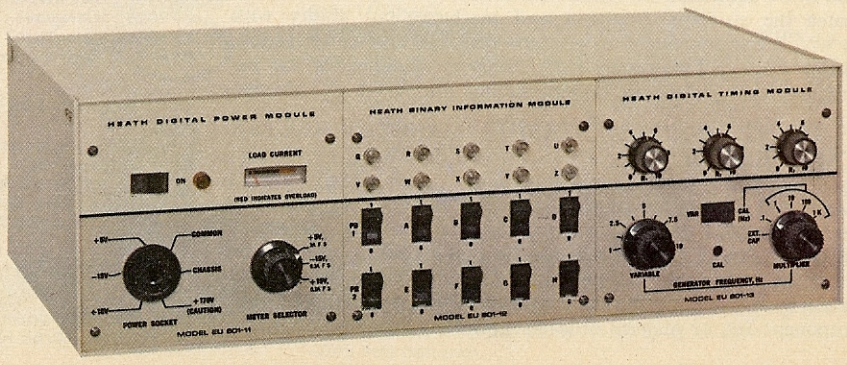




EU-805

With DVM **$1250.00**

Less DVM **$940.00**



EU-801A

$435.00

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Assembled Instrumentation

HEATH

Basic 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

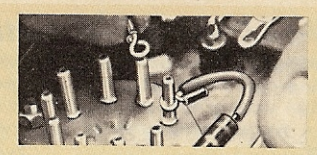
A COMPLETE COORDINATED ELECTRONICS LABORATORY FOR EDUCATION IN MODERN INSTRUMENTATION. Consists of special experimental chassis and parts, factory-assembled & tested laboratory test instruments, and the famous, comprehensive text, "Electronics For Scientists." The text authors, Drs. H. V. Malmstadt and 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.

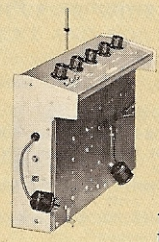
FOR ALL SCIENCES. Provides chemists, physicists, engineers, medical scientists, biologists, physiologists, students, and research workers with a firm working knowledge of the complexities of the modern complex instrumentation they use in their work.

GENERAL PURPOSE INSTRUMENTS. Many units within the EU-100A station serve multi-purpose applications. For example, the EU-20B 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 simple plug-in adapters to provide a sensitive and accurate pH meter or log-linear readout for spectrophotometry and gas chromatography for research & control labs.

The Heath/Malmstadt-Enke instrumentation philosophy exemplified in the Basic Laboratory Station, at left, is expanded in additional instrumentation for pH measurement and polarography (see page 100) and critical experimentation employing the EUW-19B Operational Amplifier (see page 93). This Laboratory can be easily extended to advanced digital electronics research and education by adding the EU-801A Analog Digital Designer and EU-805 Universal Digital Instrument (see below). For new sophisticated instrumentation for chemistry and physics, refer to page 98 and 99 for the EU-700 Monochromator.

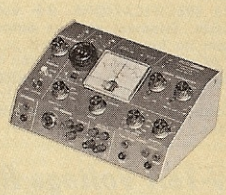
Basic circuits can be constructed, tested and modified in a fraction of the time required for conventional soldered circuits.





pH module and the capabilities of the Heath pH Recorder/Electrometer are fully described on page 100.

The Polarography Module and the capabilities of the Heath Polarography Laboratory are described on page 100.



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!

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
EU-20V 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**

New Educational Digital Instruments For The New Electronics

DIGITAL ELECTRONICS ARE TOMORROW'S ELECTRONICS. New computers, and many new instruments use digital logic circuits and read-out and the trend will increase in the future. Heath, with Drs. Malmstadt and Enke, has designed a NEW GENERATION of instruments to bring this new area to the field of educational electronics. All laboratories will soon have digital instrumentation, all people who will work in these laboratories will want to learn the fundamentals of this new and exciting technique . . . the new Heath/Malmstadt-Enke Digital-Analog Modular System is designed to teach this technique.

TWO COMPLEMENTARY DEVICES . . . A DESIGNER AND AN INSTRUMENT . . . working with the same circuit cards. The approach to digital electronics had to be simple and universal for better understanding of a sophisticated subject. The Heath/Malmstadt-Enke A/D Designer (see page 100) allows the design or investigation of digital circuitry or functional digital instruments, including analog-digital interfacing by just plugging-in the appropriate circuit cards into the chassis modules and then inserting ordinary hook-up wire leads or components into the connector boards mounted on top of the circuit cards. Each card is one or two basic circuits representing a specific function which can be studied analytically before their functions are combined to build up a complex circuit or instrument, and results can be visually displayed by the Heath Universal Digital Instrument. The circuit cards of the Instrument also can be used as components of the Designer and as permanently wired units in the same configuration.

HEATH UNIVERSAL DIGITAL INSTRUMENT can be used for many other applications within the lab because of its unique versatility, accuracy and sensitivity; it has 7 functions, one of which is a Digital Voltmeter that measures DC . . . and it performs also as a universal counter. It's description is on page 94.

INSTRUMENT AND DESIGNER form an advanced teaching device for learning digital electronics . . . and also function as unique tools for research and development in any laboratory.

Assembled Analog Digital Designer EU-801A	**$435.00**
Assembled Universal Digital Instrument EU-805A (with DVM)	**$1250.00**
Assembled Universal Digital Instrument EU-805D (less DVM)	**$940.00**
DVM Conversion pack EU-805-12	**$340.00**

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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:** 8¼" W x 6½" H x 12½" D.



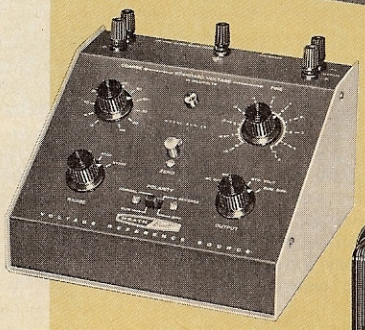
EUW-15
$75.00

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:** ±1% for coarse switch setting and ±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:** 5¾" H x 8¼" W x 8" D.



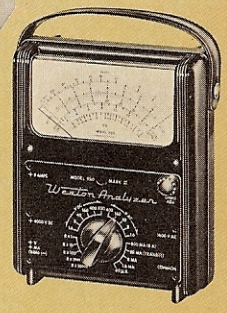
EUW-16A
$65.00

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. **Ohmmeter:** Rx1, Rx10, Rx100, Rx1000, Rx10,000. **Decibels (DB):** —15 to +6, —1 to +20, +13 to +34, +25 to +46, +33 to +54. **Accuracy:** ±2% full scale on 1.6 to 800 V DC ranges. ±3% full scale on 4000 V DC range. ±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:** 6⅝" wide x 7⅞" high x 3⅛" deep (overall). **Net weight:** 3 lbs. 1 oz. **Shipping weight:** 4 lbs.



EUP-26
$55.00

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:** (±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 voits:** (P. to P.) ±5%; 0 to 10 volt, 0 to 1 volt, 0 to .1 volt, into a high impedance load. **Source impedance:** (±10%); 10 volt range, 0 to 220 ohm; 1V and .1V ranges, 52 ohm. **Rise time:** less than .15 microsecond. **General:** Frequency accuracy; ±5%. **Power requirements:** 105-125 V AC, 50/60 Hz, 55 watts. **Dimensions:** 13" W x 8½" H x 7" D.



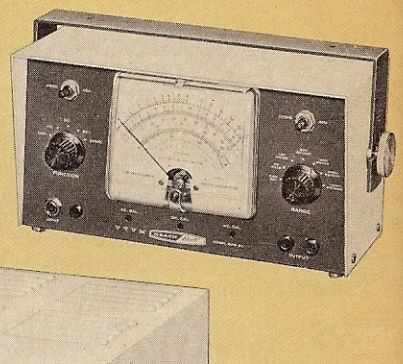
EUW-27
$94.00

EUW-24 Vacuum Tube Voltmeter

• Single AC/Ohms/DC probe • 7 AC, 7 DC, & 7 Ohms ranges • Easy to read 4½" 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:** 4½" 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 ±3%, AC±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:** 6½" H x 11½" W x 5" D.



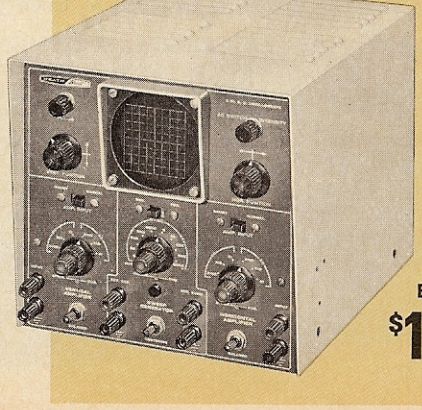
EUW-24
$62.00

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**

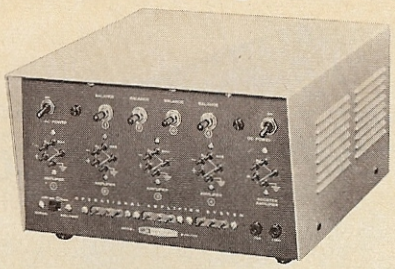
EUW-25 SPECIFICATIONS—(Vertical and horizontal channels identical): Bandwidth; DC to 400 kHz (3 db point). **Sensitivity:** 0.1 V (peak-to-peak) per ¼" (uncalibrated). **Attenuator:** 3-position, compensated type. **Gain control:** Continuously variable. **Input impedance:** 3.6 megohms shunted by 35 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:** 9⅜" H x 9⅜" W x 11⅜" D.



EUW-25
$168.00

Write On Your School Or Company Letterhead For New Free Scientific Instrumentation Catalog

Research Quality At Lowest Cost



EUW-19B
$135.00

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 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.

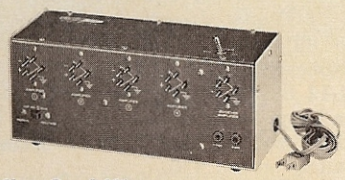
SOLVES A WIDE RANGE OF PRECISION ELECTRICAL MEASUREMENT AND CONTROL PROBLEMS . . . through circuits for summation, differentiation, integration, and through the use of components to simulate linear, logarithmic, or transcendental functions.

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 ±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 ¾ 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:** 11¼" W x 6⅜" H x 12⅞" D.



EUA-19-4
$160.00

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

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**

Ⓐ EUW-18
$22.00

EUW-28
$16.00 Ⓑ

EUW-17
$20.00 Ⓒ

EUW-29
$14.00 Ⓓ

EU-13A
$177.00 Ⓔ

EUW-30
$40.00 Ⓕ



Over 400 components

Ⓐ *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 (milliameter) full scale. **Accuracy:** ±2% of full scale. **Meter resistance:** 50 ohm. **Shunt resistors:** 1.02 ohm ±1% for 50 ma range; 2 ft. resistance wire at 9.99 ohm/ft. for 15 ma and 5 ma ranges; 100 ohm ±1% for 1.5 ma range.

Ⓑ *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 ¾" 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.

Ⓒ *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-29 Capacitance Substitution Box*

• Selects each of 18 capacitors 0.0001 mfd to 0.22 mfd • Matches dual banana plug with ¾" 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**

Ⓔ *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**

Ⓕ *EUW-30 Six-Decade Resistance Box*

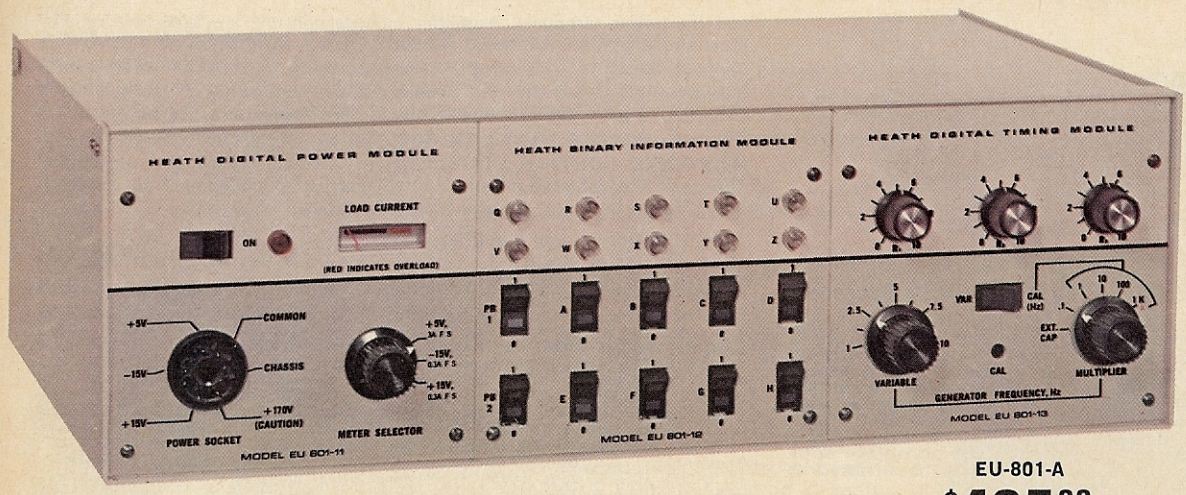
• Selects values from 1 ohm to 999,999 ohms in 1 ohm increments • ½ of 1% accuracy • Make before break switches

PROVIDES EXCELLENT RESISTANCE ARM FOR DC OR AC BRIDGES. Precision resistors assure accuracy to 0.5%. ¾" terminal spacing for dual banana plugs. 7⅛" W x 5" H x 6⅝" D.

EUW-30, 4 lbs. **$40.00**

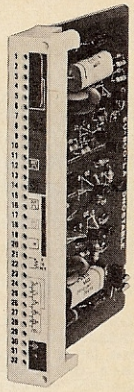
Write On Your School Or Company Letterhead For New Free Scientific Instrumentation Catalog

New Heath/Malmstadt-Enke Digital



EU-801-A

$435.00



CONVENIENT PLUG-IN CARDS

On each circuit card a schematic of different color for each different function shows the inputs and outputs. Note the "wire-patch" solderless connector board which accepts ordinary wire and component leads.

The New Heath/Malmstadt-Enke 801 Series Analog Digital Designer . . . A Unique Breadboard System Approach to Digital/Analog Instrumentation

Now you can investigate:

• Counter circuits • Scaling circuits • DVM circuits • Adders • Subtractors • Digital Analog Interface • Special circuits of your own

Custom Design your own:

• Counters • Frequency Meters • DVM • Precision Timers • Frequency standards • Digital Interface • . . . and hundreds of other digital instruments

• Unique Method of Systems and Circuit "Breadboarding" for experimentation • Assembled plug-in circuit cards • "Wire patch" fast, easy solderless connectors that accept standard wire and components leads • Factory assembled Digital Power Module, Binary Module, and Digital Timing Module • Integrated Circuits • TTL Logic • Integral Time Base • Binary readout • Integral Power supplies • Accepts cards from Heath EU-805 Universal Digital Instrument • Analog to Digital Interface enables the EU-801A to process outside information

UNIQUE, FLEXIBLE, EXTENDABLE. This new Breadboard System provides the first instrumentation package with the means to achieve virtually everything you wish in digital and analog circuitry. To investigate existing digital circuits or design your own, just plug-in the components required. To design your own special digital or analog/digital instrument, again it's just a matter of plugging in the right components . . . it's all here in the System.

The Analog Digital Designer includes a factory assembled power supply, a binary information module, a digital timing module and 13 factory assembled circuit cards. Each module may be used as an individual unit or easily connected to the others in the system cabinet shown. The circuit cards plug into each module . . . power supply connections are automatically made.

CONVENIENCE AND ADAPTABILITY OF HIGH VALUE CARDS is emphasized by the connector board which features "Wire-Patch" solderless connectors to accept ordinary hookup wire and components for rapid assembly of special circuits or the usual counting and scaling system. Cards can also be purchased separately as universal function cards. Integrated circuits employing TTL logic provide high performance, reliable "state-of-the-art" electronics at low cost. Many cards from the EU-805 also may be used increasing the ADD possibilities.

OPEN-ENDED . . . because of it's unique design which enables it to be expanded to more and more applications as new modules and new circuit cards are available following the improvement of modern technology.

REACH THE WORLD. Unlike most digital training devices which are "closed" systems, the Heath/Malmstadt-Enke Designer with its Analog Digital Interfaces is able to accept and process external information, thus opening it to the outside environment. Binary readout is built-in . . . digital readout as an option will be available shortly.

RECOMMENDED SYSTEM EU-801-A as shown includes:

EU-801-11 Digital Power Module

Supplies all voltages necessary to operate the system, distributed by 6-pin connector. (+5, ±15, +170 v.) $75.

EU-801-12 Binary Information Module

10 neon lamps and driver circuits; lamps light with application of logic 1. 8 SPDT switches and 2 SPDT spring return switches for binary information inputs. $50.

EU-801-13 Digital Timing Module

Contains function generator and three controls for use with monostable and comparator circuits. Generator range, 0.1 Hz to 10 kHz, variable in 5 decade steps. External capacitor position for other frequencies to 100 kHz. Outputs: complementary square wave, complementary pulse, and ramp. $60.

4 **EU-800-JC** Nand gate cards. Four 2-input nand gates and two 4-input nand gates per card; TTL integrated circuits, high speed (typical gate propagation delay time 13 ns). . . . . ea. $15

2 **EU-800-CB** Dual J-K flip flops. Each card contains 2 integrated circuits JK flip-flops; maximum clock frequency 15 MH typical. ea. $18

1 **EU-800-LA** Dual monostable multi-vibrator. Contains 2 monostables per card. Pulse width is variable from 10 us to 1 sec. in 5 decade steps . . . . . ea. $28

1 **EU-800-JD** Relay card. 1 per unit. Contains 7 relays and drivers for relay logic; provides multiple connector capacity similar to EU-50-AD; requires two card spaces. . . . . ea. $29

1 **EU-800-HB** Comparator/V-F card. Card can be patched to function either as a comparator—good to 100 kHz or as a voltage to frequency converter. 1000 Hz per volt. . . . . ea. $35

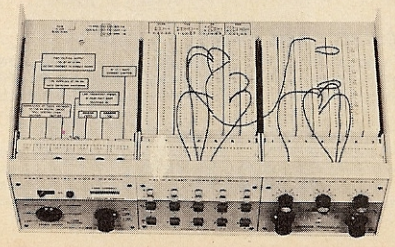
1 **EU-50-MC** Dual Inline IC card. Contains 2 IC sockets (16 pin) with leads brought up to connector housing for patching any 14 or 16 pin dual inline IC. . . . . ea. $11

2 **EU-50-MD** Multiple connector/blank PC cards. Provides multiple connections for patching convenience; can be etched by experimenter to make his own circuit board. . . . . ea. $10

1 **EU-900-NA** Operational Amp. card. Consists of one 1,200 megohm input impedance operational amplifier (common mode), feedback resistors, balance pot and analog-to-digital converter; initial input offset current (typical) 3 nA. . . . . ea. $40

Among the cards from the EU-805 which can be used are Gate Cards, Over range card, DCU cards, Oscillator card, Scaler card, VCO card and V-F Integrator card.

EU-801-A, Analog Digital Designer (with modules and cards). **$435.00**



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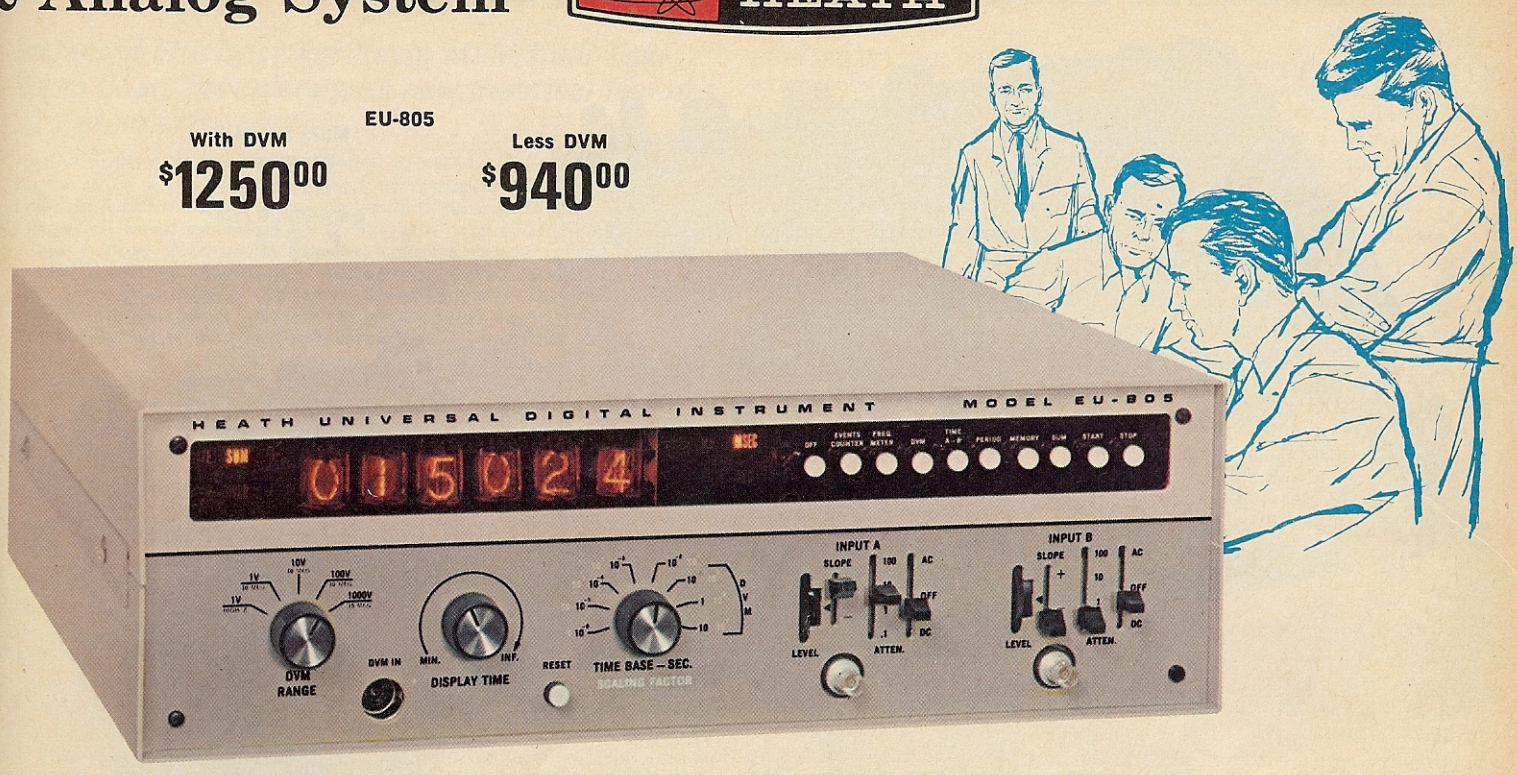
& Analog System

HEATH

EU-805

With DVM **$1250.00**

Less DVM **$940.00**



The First Truly Universal Digital Instrument . . . The New Heath "805" Series Features:

- VERSATILITY for multiple measurement capabiilties . . . a Digital Voltmeter is combined with a Universal Counter thus making the "805" a Universal Instrument
- COMPATIBILITY with Heath Digital Systems. The modular design of the "805" permits the plug-in circuit card addition of new functions to the Instrument and permits "805" cards to be used in the "801" for instrument development and education
- HIGH ACCURACY: 0.05% as DVM and 1 count in Frequency, Time Interval and Period Modes
- SENSITIVITY OF INPUT COMPARATORS: 10 mV from DC to 10 MHz and 25 mV over 10 MHz
- RESOLUTION OF 10 uV IN DVM Mode
- STABILITY OF TIME BASE: Better than one part in 10^6 for the long term basis except in DVM Mode
- EASY TO READ 6 DIGIT READOUT of high contrast indicators with floating decimal point . . . plus over-range
- FAST CYCLING on slow time bases allows continuous reading
- SUMMING FUNCTION allows a continuous summation of measurements without display reset in all modes when required
- TTL integrated Circuitry
- ECONOMY . . . the "805" replaces many expensive instruments by its versatility
- LOWEST PRICE of any on the market for comparable functions and performances

All instrument functions available on front panel—Display memory and display sum available on front panel—Extended Range Variable Display Times—Continuously available start and stop functions—Twelve status indicators show exact condition of instrument—Both channel A and B are available at rear panel for oscillographic monitoring of triggering point—Two independent Input Comparators—Automatic Mode Triggering . . . allows triggering at input signal zero crossing point—Voltage to Frequency output available at Rear Panel . . . allows the instrument to be used as a digital integrator—Rear Panel Access to Clock Scaler provides Standard Time Intervals in Decades from 1 uS to 10 S or continuous 1 uS—Rear Panel Input for External Time Standard—Four levels of Input Attenuation—Channel B may be disconnected from instrument and used separately.

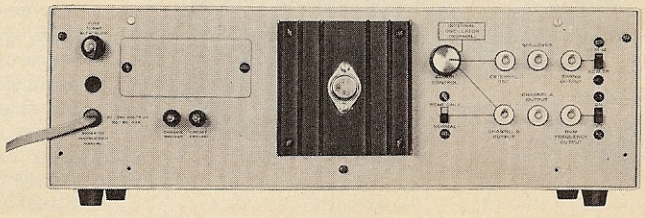
7 INSTRUMENTS IN ONE . . .

- Events Counter
- Frequency Meter
- Integrating Digital Voltmeter
- Ratio Meter
- Time Interval Meter
- Period Meter
- Voltage Integrator

The Heath "805" Universal Digital Instrument is the ideal general purpose instrument . . . it combines the capability of making many standard measurements with high accuracy with the adaptability required of modern research instruments and a very low price. It has its place in academic and industrial research laboratories as well as in instructional laboratories as a companion to the Heath "801".

Assembled EU-805D, less Digital Voltmeter Function **$940.00**
Assembled EU-805A, with Digital Voltmeter Function **$1250.00**
EU-805-12, Digital Voltmeter Modular Conversion pack to convert EU-805D into EU-805A **$340.00**

EU-805 SPECIFICATIONS—Digital Voltmeter: 0.05% Accuracy, 5 Gigohms (5 x 10^9) Input Impedance on Separate 1 v. Range (10 microvolt resolution), 1, 10, 100, 1000 Volts Ranges—10 Megohms input impedance, Automatic Polarity Indication, Selectable Gating/Integrating Times . . . 0.1, 1, 10 Seconds, 10% Over Range Capability. **Frequency Meter:** Frequency measuring capability better than 12.5 MHz. Two Channel Input for Frequency comparison or A/B Ratio Measurement Resolution at Maximum Gate Time. 0.1 Hz ± 1 Count. Time Bases 1, 10, 100 uS; 1, 10, 100 milliseconds; 1 & 10 seconds. **Events Counter:** Either Manual or Electronic Gating for "Start" and "Stop", Events may be scaled in decade step to 10^7 . . . allowing a total count up to 10^{13} events without over ranging. Input pulse resolution better than 50 Nanoseconds. **Time Interval Meter:** Either Manual or Electronic Gating for "Start" and "Stop", Switch selection for Minimum Time Resolution 1, 10, 100 uS; 1, 10, 100 milliseconds and 1 & 10 seconds. **Period Meter:** Either Manual or Electronic Gating for "Start" and "Stop", Switch selection for Minimum Period Resolution same as for Time Interval Meter, Two Channels Input for Period Comparisons or A/B Ratio Measurement.



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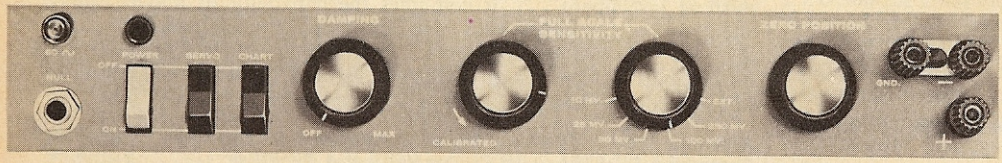
New Improved Famous



Multi-Speed
Recorder
EU-20V
$295.00

Single-Speed
Recorder
EU-20B
$209.00

New, convenient operating controls all on one panel, providing simple, yet complete, Control Center.



New Heath Log/Linear Current Module Converts Heath Recorders For Use In Spectrophotometry and Chromatography



EU-20-28
$198.00

Equip Your Laboratory Now With A Multi-Speed Log/Linear Current Recorder . . . for less than $500!

EXPANDED CAPABILITIES FOR NEW AND PREVIOUS MODELS OF HEATH CHART RECORDERS. The Heath EU-20-28 Log/Linear Module converts the Heath voltage-measuring recorders into current-measuring devices permitting their use in the small current area of photodetectors as used in spectrophotometry or ionization detectors used in gas chromatography, or other micro-current measuring applications. Absorbance spans of 0-1 and 0-2 can be read directly on the 10 inch scales of the chart recorder as the Log current ranges of this new module can be switched to provide 1, 2, or 4 log decades in the full-scale span. In the Linear mode, eleven linear ranges from 5 x 10^{-7} to 2 x 10^{-10} amperes full scale are switched in a 5, 2, 1 sequence. Thus percentage of Transmittance can be read 0-100% and 0-10% on a full scale span. Other 10% Transmittance spans such as 10-20%, 20-30%, etc. can be selected. Ten full-scale ranges of current suppression (zero offset) permit measurement of smaller currents superimposed on larger current. See full details in the new Scientific Instrumentation Catalog.

EU-20-28, Log/Linear Module, 8 lbs. **$198.00**

Write On Your School Or Company Letterhead For New Free Scientific Instrumentation Catalog

Heath / Malmstadt-Enke Servo Chart Recorders

Increased Efficiency For Heath Malmstadt-Enke Servo Chart Recorders with new practical features . . . at no extra cost

• New built-in Zener supply • New drive cord layout • New chart paper drive • New circuit board construction • New 3 terminal floating input • New, more convenient operating controls • Five ranges of input sensitivity—10, 25, 50, 100 & 250 millivolts full scale • True potentiometric null-point balance on all ranges • Better than 1% accuracy • Better than 0.2% repeatability • 0.1 sec./inch response • 10 inch linear scale • Either 2 inches/minute single-speed version (EU-20B) with additional chart motors available or multi-speed version (EU-20V) with 21 electronically-accurate, switch selected chart speeds from 12 inches/minute to ½ inch/hour • Multi-speed version features auxiliary input to chart drive circuitry allowing electronic synchronization of recorder time base with external events • Uses inexpensive cartridge pen • Completely factory assembled and tested

PRECISION AND VERSATILITY FOR RESEARCH, EDUCATION AND INDUSTRY AT LOW COST. Heath Servo Chart Recorders are high performance instruments designed to provide direct readout of signals in the range 10 to 250 millivolts DC (full scale readings). Maximum response to changing signal values is 0.1 seconds/per inch . . . 1 second for a full scale deflection. All components have passed careful evaluation, and high quality is emphasized throughout the instruments. Another important feature of this design is the simplicity with which it can be modified for special requirements, such as the control of auto-Recorders provide all scientists with an accurate, dependable instrument matic burettes and other closed-loop feedback mechanisms. The Heath that fulfills a multitude of research, education, and control applications. Typically, these instruments are used for recording pressure, speed, temperature, strain, pH, metallic ion concentrations, percentage of oxygen, intensity of light, radiation and many other phenomena when used with suitable transducers and modular circuitry.

MODULAR PLUG-ON ADAPTER CHASSIS AVAILABLE. The blank chassis EUA-20-1 plugs onto the rear of the Heath recorders for adding modular circuitry of your own design, such as special electrometer inputs, and integrating amplifiers. Heath supplies a factory-assembled module for converting the recorder to a recording pH meter and millivolt electrometer, and a log-linear current detector for spectrophotometry and gas chromatography . . . see p. 96 and 100.

FULL-FEATURED NEW DESIGN. New Zener supply provides long-term stability. New 3 terminal input permits operation without the chassis being common to signal. New improved drive-cord layout assures uniform pen response in both directions with low friction and low maintenance. New circuit board construction provides stable, consistent circuits. Other features include the use of standard cartridge type pen or popular felt tip pen (multi-colored chart plots can be obtained quickly and simply by merely changing the clip-on pen), rapid chart advance, paper tear-off guide. Special stand-by circuit prolongs the life of the chopper. The impedance reduction damping feature of the recorder makes it possible to introduce damping into the servo system without appreciably increasing the dead zone. Additional chart-speed motors are also available at low cost for Model EU-20B recorders. Easy access to motor mounts permits fast, easy change to other speeds. Model EU-20V provides a selection of 21 chart speeds from 12 inches per minute to ½ 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 Scientific Instrumentation Catalog, which includes a block-diagram type of discussion on the operation of this unit.

EU-20B, Single-Speed Chart Recorder, 23 lbs.
(REA Express or Motor Frt. only) **$209.00**

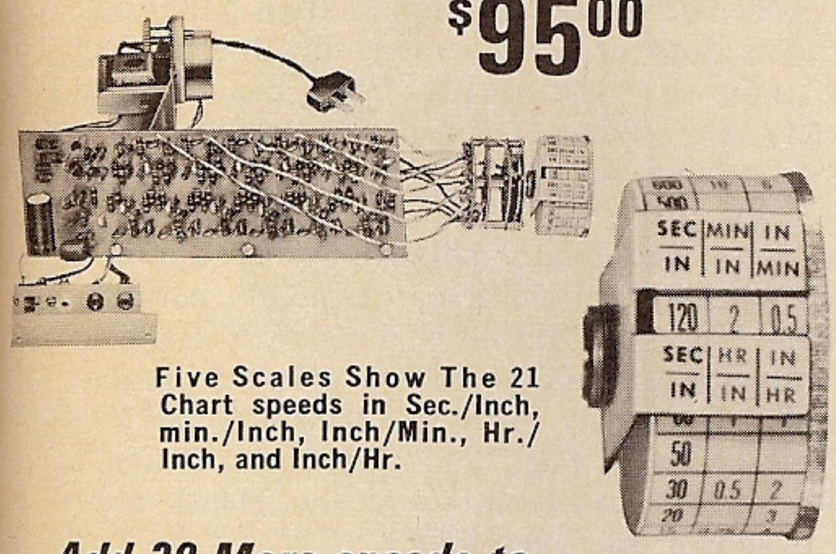
EU-20V, Multi-Speed Servo-Chart Recorder, 26 lbs.
(REA Express or Motor Frt. only) **$295.00**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

EUA-20-1, Blank plug-in adapter chassis, 5 lbs. **$9.00**

Chart Drive Motors for EU-20B and EU-20V Recorders, provided with 3 gears for correct installation. Wt. 1 lb. Price each **$13.00**
EU-20-2, .1 inch/min.; EU-20-3, .2 inch/min.; EU-20-4, .5 inch/min. EU-20-5, 1.0 inch/min.; EU-20-9, 12.0 inch/min.; EU-20-10, 2.0 inch/hour

EU-20V SPECIFICATIONS—Chart Paper: Grid width, 10''. Length, 120 foot roll. Markings, 0-100, right to left. **Chart Speed:** 5 seconds per inch to 2 hours per inch in 21 speeds, with internal signal. Any speed up to 5 seconds per inch with external signal. (See complete EU-20-26 specifications.) Model EU-20B features standard speed 2 inches per minute only with additional chart-drive motors available. **Chart Span:** Five fixed ranges: 10, 25, 50, 100, and 250 mv, plus a sensitivity control to permit adjustment for any value from 10 to 250 mv. Also external position available for special plug-in ranges. **Pen:** Standard fountain pen, cartridge-type. **Balancing Time:** 0.1 second per inch, 1 second full scale (10''). **Error** (includes dead zone): Less than 1% of full scale for all ranges. 10 to 250 mv. **Repeatability:** 0.2%. **Maximum Source Resistance:** 50 K ohms. **Reference System:** Zener supply. **Power Requirements:** 105-125 volts 60 Hz AC; 57 watts. **Dimensions:** (includes clearance for control knobs) 15'' W x 8¾'' H x 13⅜'' D.

EU-20-26
$95.00



Five Scales Show The 21 Chart speeds in Sec./Inch, min./Inch, Inch/Min., Hr./Inch, and Inch/Hr.

Add 20 More speeds to Your EU-20B from 12" min. to 0.5"/hr. With this Chart Drive Unit

• Instantaneous selection of 21 accurate speeds from 5 seconds to 2 hours per inch when using internal line frequency signal • Unlimited variation in speeds up to 12 inches per minute when using an external chart drive signal • All chart speeds as accurate as 60 Hz AC line frequency, when using internal drive signal • The chart motor may be programmed by external signals • Output signal for synchronizing related events or other recorders • Install in any Heath EU-20B, EUW-20A Servo-chart recorder or EUW-301 Recording pH meter/electrometer • Includes complete, detailed instruction manual • Factory wired and tested • Provided with 3 gears for correct installation

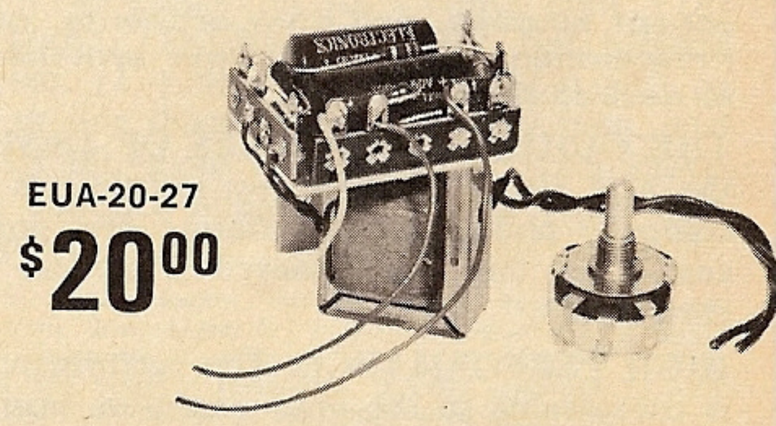
EU-20-26, Multi-Speed Chart Drive,
4 lbs. **$95.00**

EU-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 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.

EU-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.



EUA-20-27
$20.00

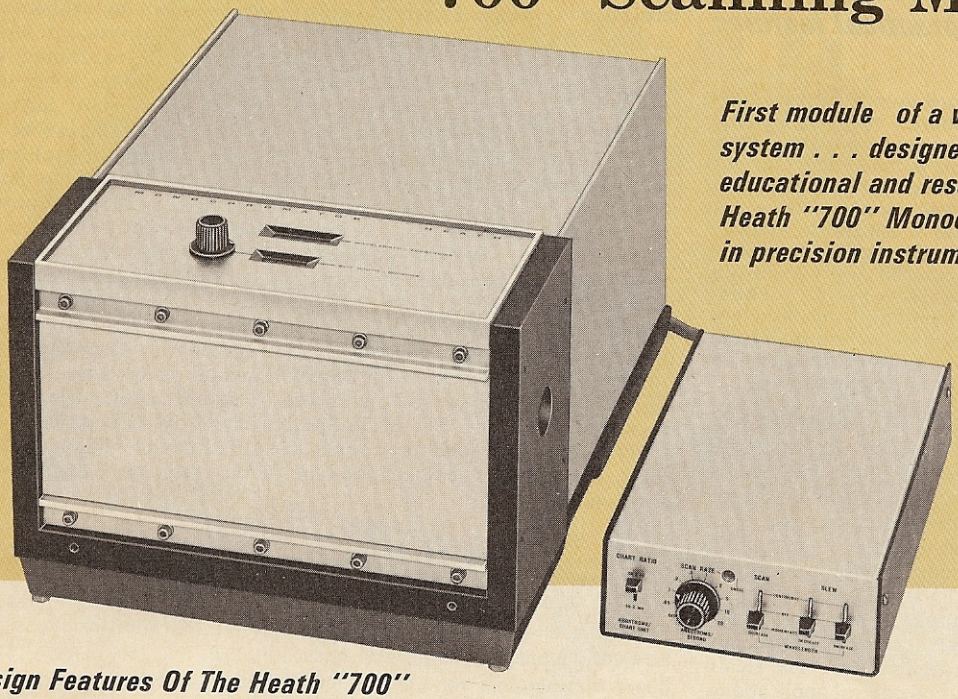
Modernize Your Heath EUW-20A And EUW-20M Recorders By Adding Factory Assembled Zener Supply

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 previous 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 watts. **Size:** 2½'' H x 2¼'' W x 1¾'' D.

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

Assembled EU-700

$1,195.00

Design Features Of The Heath "700"

• Precision Optics; Czerny-Turner type, 350mm, f/7. 1180 lines/mm grating, blaze wavelength 2500 angstroms, UV-VIS zero order to 10,000 angstroms first order; MgF_2 coated mirrors; better than 1 angstrom resolution • Electronic Scanning control; remote control unit; 9 fixed rates to 20 angstroms/sec.; variable from external sources; integrated-circuit digital pulses control wavelength drive in 0.1 angstrom steps; bi-directional slewing at 5,000 angstrom/min. • Recorder Readout; "700" synchronizing pulses electronically lock Heath Chart Recorder to wavelength drive for direct readout in angstroms/inch, any scan rate; 12 ratios • High Mechanical Stability; precision base castings; tracking ±1 angstrom; exact alignment • Variable Slit Width; bilateral ganged slits; read out directly in microns on 4-digit counter • Purgable with dry nitrogen to extend range below 2,000 angstroms • Versatile; precision face plates each side accept sources, cell compartments, other modules • Auxiliary Programming; accessory limit switches can program scanning to desired ranges.

THE GUIDING PRINCIPLES OF DESIGN in the development of the new Heath spectroscopy instruments were in keeping with the company philosophy of offering precision equipment at the lowest cost. That this was achieved is evident in the new Heath Monochromator.

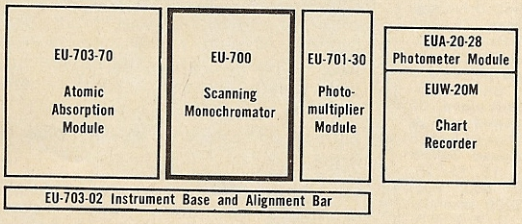
HIGH PERFORMANCE. The performance of the new Heath "700" is comparable to the most expensive instruments. Here in one compact package is a monochromator for use in the UV-VIS region; with features including variable, ganged slits, resolving power better than 1 angstrom, tracking accuracy within ± 1 angstrom, chart-recorder synchronization, digital electronic scanning control system . . . all for just $1195.

MODULAR VERSATILITY. A part of the Malmstadt-Enke modular system of scientific instrumentation, the Heath systems of spectroscopic instrumentation are created by combining a related series of unique integrated modules. Together they provide research-quality spectrophotometers for atomic and molecular absorption, emission, fluorescence, and many other spectroscopic techniques. Each module is designed to be used separately or integrated with its series companions. Each shares the features and "open-ended" advantages which encourage the user to recombine or modify to perform any special task he may face.

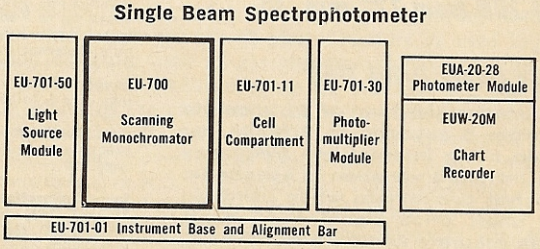
NEW APPROACHES. Innovative thinking is evident in the new Heath "700" Monochromator . . . in the use of new materials, in the application of old materials in a new fashion. Examples: (1) New Digital Operation. New convenience, compactness, and controllability through modern digital systems. The Heath "700" uses integrated circuits (IC) in a digital technique to develop electronic pulses for controlling wavelength drive. This digital system permits exact synchronization of wavelength scan with the Heath chart recorder in a great variety of selected or programmed scan rates. A separate motor permits rapid bidirectional wavelength change at greater than 5,000 angstroms per minute. All this is done at a convenient location through the remote control drive unit. (2) The Heath "700" has bilateral, ganged slits of a completely new design . . . a design which assures parallelism of the precision-ground slit jaws, repeatability of setting and smooth control.

LOW COST. Consistent with the Heath philosophy of optimum value, the new "700" offers uncompromised research-quality performance, sound design without frills. The result is a cost-per-use ratio so low as to make this instrument available to the greatest number, and to make multiple installations easily justified. Accessory modules will be proportionately low in cost. The "700" Monochromator is available now; accessories will be available soon; the Heath chart recorder, available now, is shown on pages 96-97.

Atomic Absorption, Fluorescence & Flame Emission Spectrophotometer

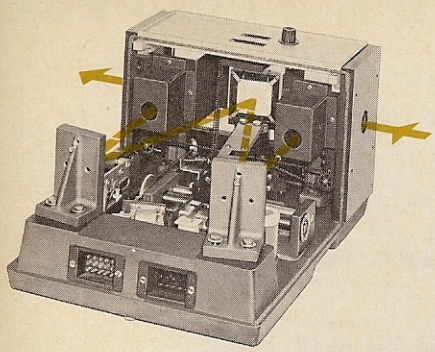


Single Beam Spectrophotometer

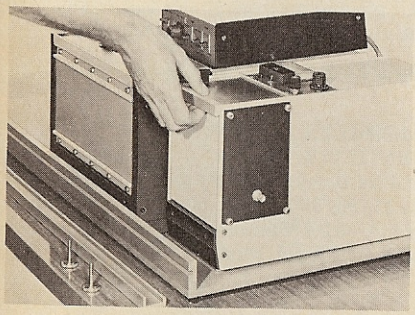


Shown above are illustrations of the modular concept common to all Heath scientific instrumentation. The "700" Monochromator is the basic module of these and of an extensive series of future instruments. And as new techniques are developed, Heath will provide the required modules. The Heath Chart Recorder is available now, other accessory modules shown above will be available soon. This modular concept permits research-quality performance at low cost, provides state-of-the-art equipment, and encourages modification to your exact needs.

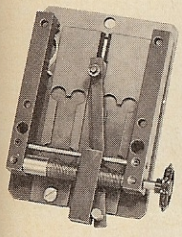
Write On Your School Or Company Letterhead For New Free Scientific Instrumentation Catalog



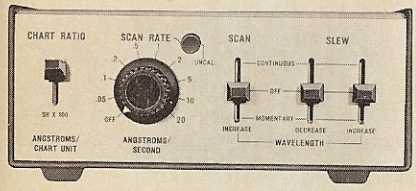
In-line entrance and exit beams . . . the optical path is shown above. The achieved compactness means that the "700" fits with other modules on a lab bench. Note the light-baffle system.



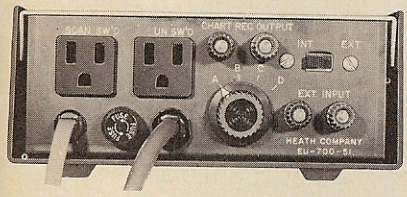
Here is how simply the "700" can be integrated with other input and output modules to make a precision instrument. The front alignment bar provides automatic optical alignment.



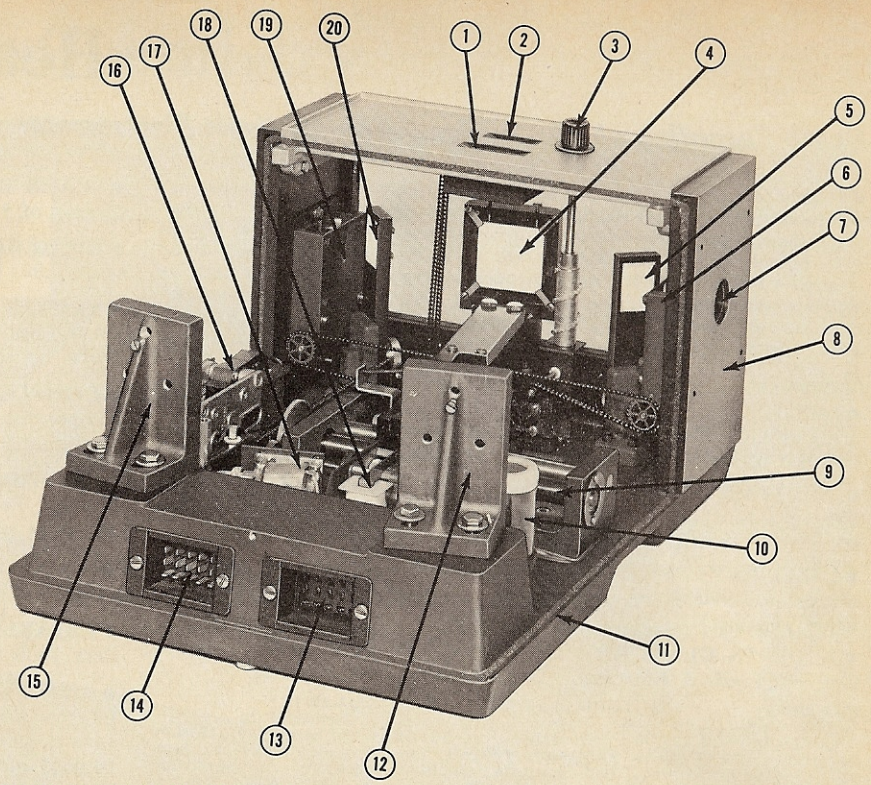
The design of the "700" bilateral slit is simple and rugged. Entrance and exit slits are ganged to a single control, and are factory calibrated by laser beam diffraction; slitwidth is read out directly in microns on the counter.



DIGITAL SCANNING
The Control Unit provides complete remote control of wavelength scan, scan rate, slew and readout synchonization. Nine basic scan rates are available on two ranges. Recorder chart calibration maintained to the angstrom/inch ratio selected.



On the rear panel of the Control Unit are the output terminals for the synchronizing pulses to the recorder, a chart-recorder synchro-switch, input terminals and selector switch for external scan rates.



Inside The Heath "700" Monochromator

(1) Wavelength readout in angstroms on a 5-digit counter, readable to 0.1 angstrom. (2) Slit width readout in microns on a 4-digit counter. (3) Slit width control knob. (4) Grating and sine bar assembly; standard grating supplied is 1180 lines per mm blazed at 2500 angstroms (other gratings available as options); sine bar is machined to close tolerances and precisely adjusted at factory. (5) Entrance folding mirror, front surface type, flat to ¼ wavelength Hg green overcoated with MgF_2, precisely positioned in removable mount. (6) Slit assembly: bilateral slits, continuously variable between 5 and 2,000 microns; entrance and exit slits ganged to single control. (7) Slit port with unique dark-seal coupling which holds quartz window and aperture discs, and makes light-tight seal between modules. (8) Side plate accurately machined and provided with threaded holes for attachment of custom modules. (9) Precision lead screw, machined to close tolerances, hardened. (10) Desiccant vial for moisture absorption; indicator, reusable type. (11) Massive aluminum-alloy base casting. (12) Parabolic collimating mirror, 2" diameter, 350 mm focal length, corrected to ¼ wavelength Hg green, MgF_2 overcoated. (13) Auxiliary connector for special programming. (14) Connector for Control Unit. (15) Focusing mirror, same as collimating mirror, #12 above. (16) Slewing motor, fast forward and reverse, approximately 5400 angstroms per minute. (17) Solenoid to activate stepper or slewing-motor clutches. (18) Stepper motor, rotates grating through precision gear train, lead screw, and sine bar in 0.1 angstrom steps. (19) Exit slit, same as entrance slit, #6 above, ganged to entrance slit. (20) Exit mirror, same as entrance mirror, #5 above. Note: light baffles not shown in this interior view. See photo top left.

EU-700 SPECIFICATIONS—Aperture Ratio: f/6.8 at 2000 angstroms. **Focal Length:** 350 millimeters, **Resolving Power:** Better than 1 angstrom. Line-profile half-width less than 0.5 angstrom. **Stray Light:** 0.1% or less within ±1 ½ bandwidths of a given line. **Wavelength Range:** Zero order to 10,000 angstroms, first order, with 1180 line/mm grating. Usable range with standard 1P28A detector, limited by air cutoff and detector sensitivity, is 1900 angstrom to 7000 angstrom. Lower limit may be extended to below 1800 angstrom by flushing the optical path with dry nitrogen . . . upper limit by use of other available detectors. **Wavelength Accuracy:** Relative error ±1 angstrom throughout usable wavelength range. **Wavelength Resettability:** ±0.1 angstrom on the basis of resetting on the maximum of a narrow emission line, with photo-detected recorder output as indicator. **Reciprocal Dispersion:** Approximately 20 angstrom/mm at exit slit with 1180 lines/mm grating. **Scanning Rates:** Nine (9) scanning speeds; digitally-controlled scanning rates of 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10 and 20 angstroms/sec in direction of increasing wavelength.

Assembled **EU-700,** Monochromator, 66 lbs. $1269.00

TYPE OF SPECTROPHOTOMETER (√ INDICATES MODULES REQUIRED)

	SINGLE BEAM	ATOMIC ABSORPTION	ATOMIC FLUORESCENCE	FLAME EMISSION	DOUBLE BEAM	MULTIMODE	EXPECTED AVAILABILITY
EU-700 HIGH-RESOLUTION SCANNING MONOCHROMATOR MODULE	√	√	√	√	√	√	NOW
EU-701-50 UV-VISIBLE LIGHT SOURCE MODULE	√				√	√	SPRING 1969
EU-701-11 MULTIPLE CELL COMPARTMENT MODULE	√					√	SPRING 1969
EU-701-30 PHOTOMULTIPLIER MODULE	√	√	√	√	√	√	SPRING 1969
EU-251-A HIGH-PRECISION DIGITAL READOUT (SERVO TYPE) MODULE	√	√	√	√		√	SPRING 1969
EU-703-70 ATOMIC ABSORPTION/ FLAME EMISSION/FLUORESCENCE MODULE		√	√	√		√	SPRING 1969
EU-707-11 DOUBLE BEAM					√	√	SPRING 1969
EU-703-02 INSTRUMENT BASE AND ALIGNMENT BAR	√	√	√	√	√	√	SPRING 1969
EXPECTED SYSTEMS PRICE	$2,200	$2,500	$2,500	$2,500	$2,600	$3,500	

(FOR LOG-LINEAR MULTI-SPEED RECORDER READOUT, ADD $493 TO SYSTEMS PRICE SEE P. 96)

Heath Recording ph Meter/Recording Millivolt Electrometer . . . Single 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 ± 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.

• **MULTI-SPEED MODEL WITH 21 ELECTRONICALLY SYNCHRONIZED RECORDING SPEEDS.** The EUW-301M model features chart speeds from 12″/min. to ½″/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 97 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 EU-20V 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 EU-20B or EU-20V 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 EU-20B or EU-20V Servo Chart Recorder) **$30.00**

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 • Chrono-potentiometry • Amperometric titrations • And other similar electro-chemical processes, 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)

The Heath EUW-402 Polarography Laboratory provides exact qualitative and accurate quantitative electrochemical analysis for oxydizable 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. And full capabilities are included for adjustable electrode current suppression and adjustable charging current suppression. All equipment supplied factory assembled.

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**
EU-20B, Single-Speed Servo-Chart Recorder, 23 lbs. **$209.00**
EU-20V, Multi-Speed Servo-Chart Recorder, 26 lbs. **$295.00**
EUW-401, Electronic Polarography Instrumentation (EUA-19-2, EUW-19B, EU-20B), 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, EU-20B & EUA-19-6), 73 lbs. **$609.00**
EUW-402M, Complete Polarography Laboratory with Multi-Speed Recorder Readout (EUA-19-2, EUW-19B, EU-20V & EUA-19-6) 79 lbs. **$700.00**
All express or Motor Freight Only, Except EUA-19-2

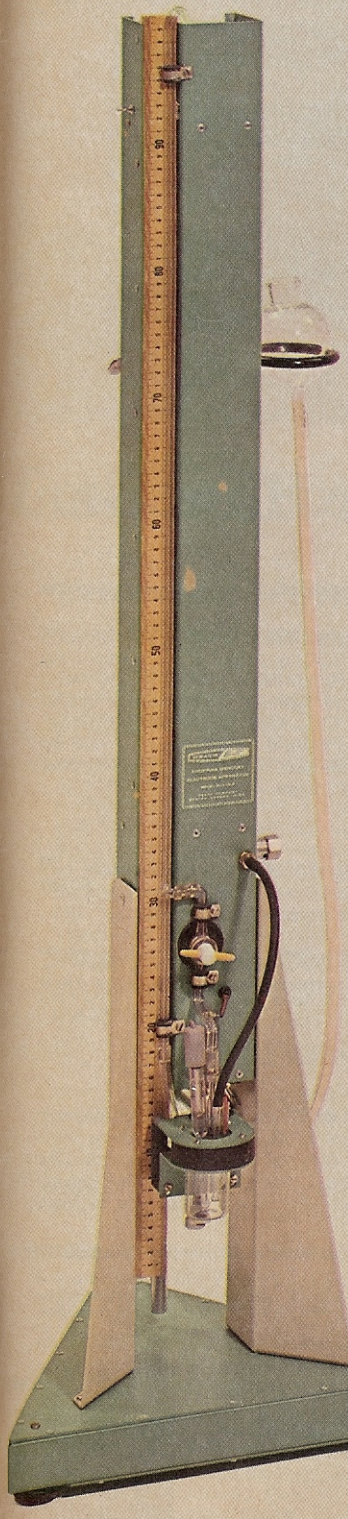
EUA-19-6 DROPPING MERCURY ELECTRODE APPARATUS SPECIFICATIONS—Includes all electrodes for 3-electrode controlled potential polarography dropping mercury electrode (less Hg°), calomel reference electrode, platinum counter electrode • Easy to set up • Simple to operate • Teflon® stop cock on mercury supply • 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: ±1%, individually calibratable to 0.1%. Linearity: better than 1% for 1 volt sweep. Range: ±5 v. Hold: 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: ±1% at output jacks, ±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 microamperes volt of sweep.
*Plugged on front of Heath EUW-19B Operational Amplifier System and using 3-electrode cell and dropping mercury electrode.

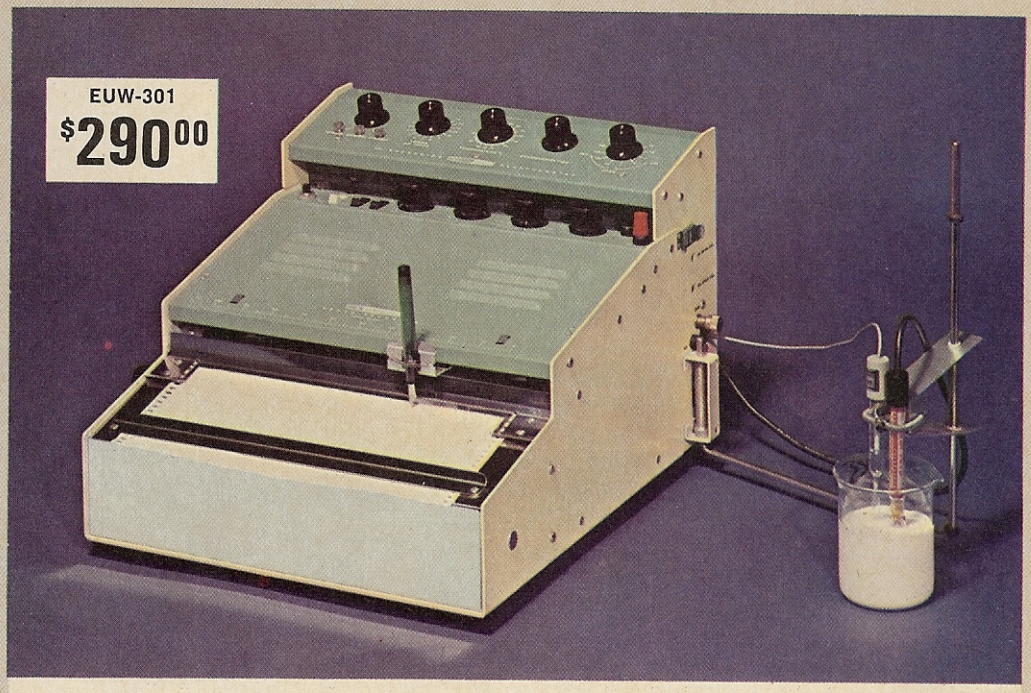
Write On Your School Or Company Letterhead For New Free Scientific Instrumentation Catalog

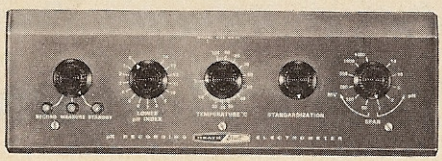
Instrumentation For Chemistry

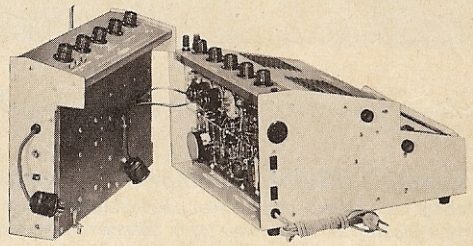
Includes Dropping Mercury Electrode Apparatus, Operational Amplifier System Polarography Module, and Servo Chart Recorder



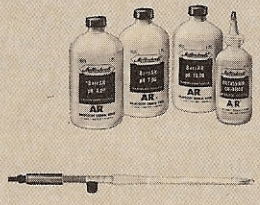
EUW-301
$290.00





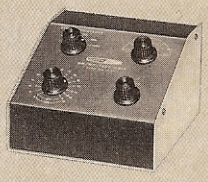


pH Module Controls Complete, easy to operate. Regular controls on Chart Recorder are inactivated when pH module is connected.



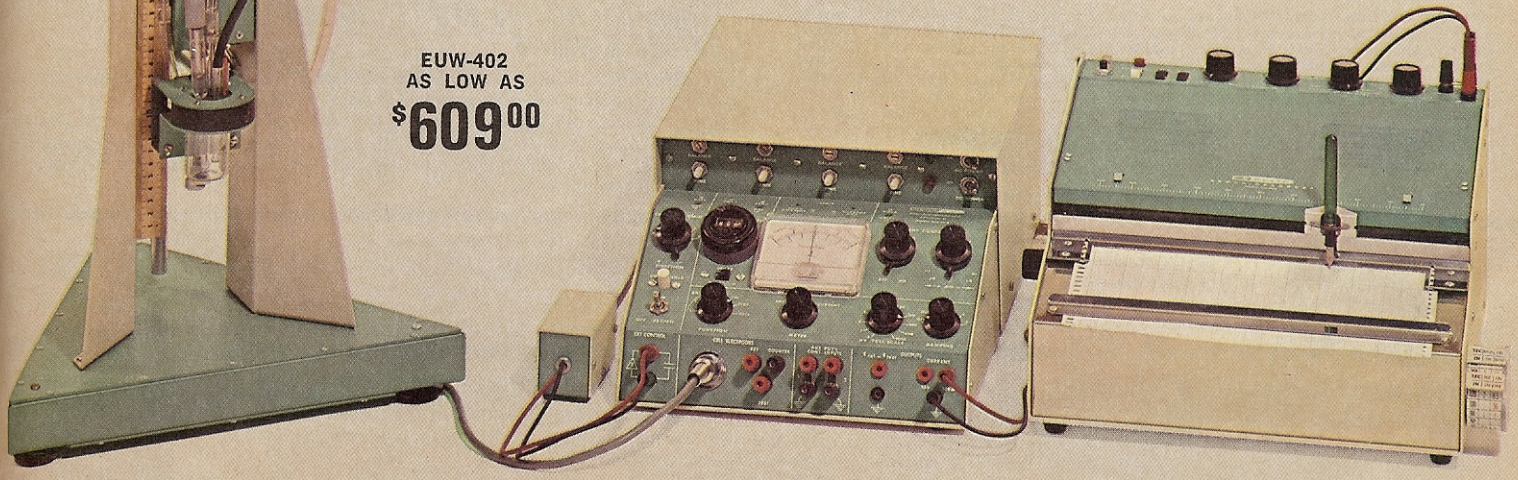
EUA-20-17
Buffer Assortment $10.50
One pint each of pH 4.01, 7.00 & 10.00 buffers plus a 150 ML bottle of saturated KCL solution.

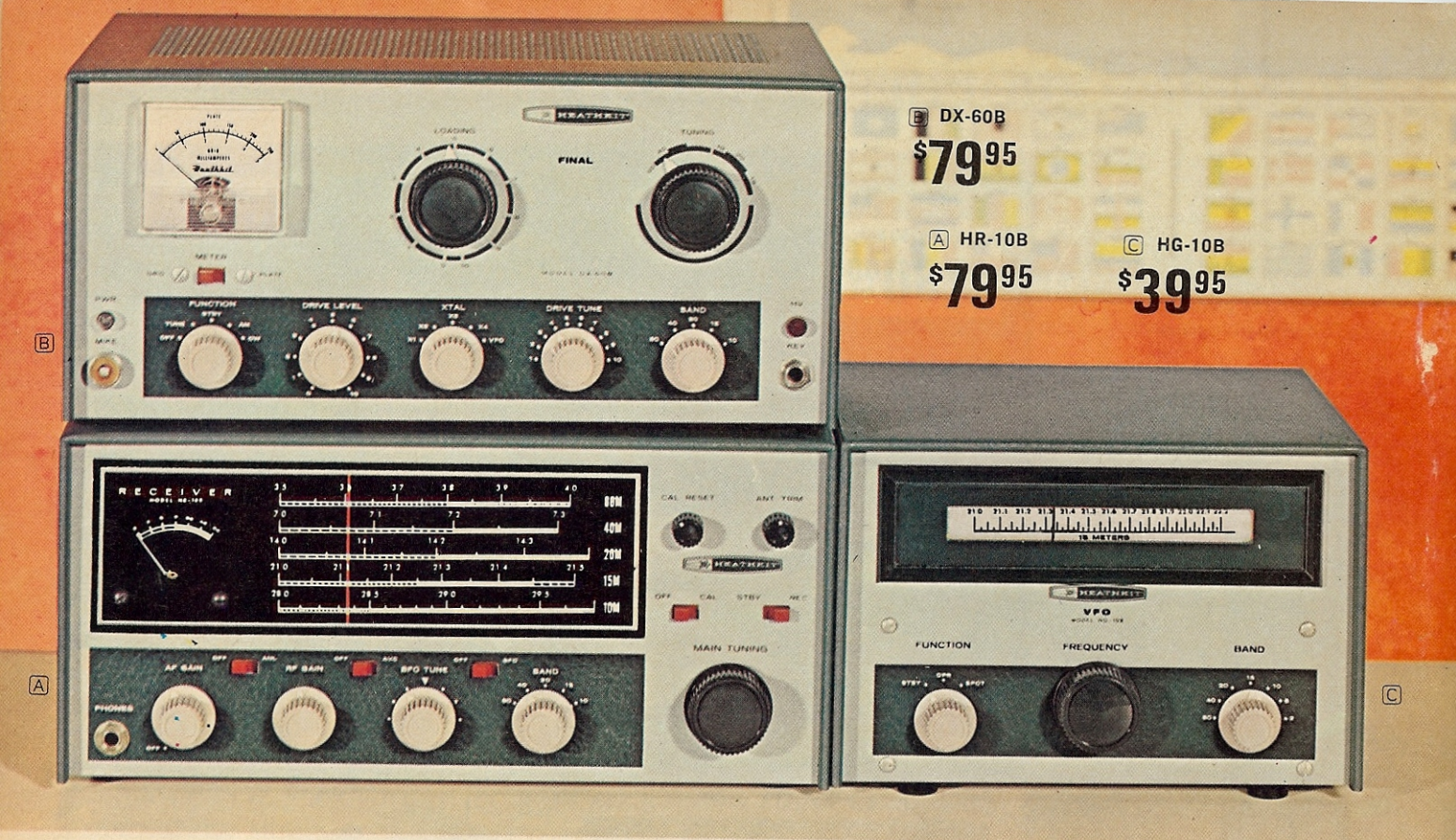
EUA-20-23
Combination pH Electrode $52.00
Sargent S-30070-10 includes pH and reference electrodes in single glass envelope.



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.

EUW-402
AS LOW AS
$609.00





The World's Most Popular Ham Gear

Ⓐ Heathkit HR-10B Amateur Band Receiver

• Deep forest-green cabinet and pale gray-green panel matches Single-Banders and 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 superheterodyne circuit • RF amplifier for extra sensitivity–high image rejection • Pre-built, pre-aligned tuning unit for easy assembly

A QUALITY RECEIVER ANY HAM WOULD BE PROUD OF. Ideal for the novice or beginning general class ham who desires full AM, CW and SSB tuning capability, with solid stability for CW & sideband. Each amateur band 80 through 10 meters is accurately calibrated on the illuminated slide-rule dial. Separate RF and AF gain controls and BFO tuning give you the facility you need in a communications receiver. The "S" meter, AVC on/off, and automatic limiter, and provisions for the optional HRA-10-1 plug-in 100 kHz crystal calibrator add the convenience you'll demand. Alignment requires RF signal generator and VTVM.

Kit HR-10B, less speaker, 20 lbs., no money dn., $8 mo. **$79.95**
Kit HRA-10-1, Plug-in 100 kHz crystal calibrator, 1 lb. **$8.95**

HR-10B SPECIFICATIONS—Frequency coverage: 80 through 10 meters. **IF frequency:** 1681 kHz. **Sensitivity:** 1 uv for 10 dB signal-to-noise ratio. **Image rejection:** 40 dB or better. **Selectivity:** 3 kHz at 6 dB, 9 kHz at 40 dB. **Input impedance:** 50 to 75 ohm, coaxial. **Audio output impedance:** 8 or 500 ohm. **Tube complement:** 6BZ6, (2) 6EA8, 6BA6, 6BJ7, 6EB8, 6X4. **Power requirements:** 120/240 V. AC, 50/60 Hz, 50 watts. **Dimensions:** 13¾" W x 11½" D x 6½" H.

Ⓑ Heathkit DX-60B Phone & CW Transmitter For Novices & General Class Operation

• Color styled in deep forest-green & pale gray-green • 90 watts AM or CW on 80 through 10 meters • Neutralized final amplifier for stable, dependable operation on all bands • Built-in low pass filter to eliminate TVI • Grid-block keying–ideal with the HD-10 Electronic Keyer • 4 crystal sockets easily accessible • Full provisions for operation with matching HG-10B VFO • Operates at reduced power for Novice Class • Performance and styling mate to the HR-10B • A better value than any transmitter in this price range

MORE FOR YOUR TRANSMITTER DOLLAR THANKS TO HEATH TOTAL ENGINEERING. Run 75 watts CW input power for novice class operation—then run the full 90 watts input power on phone or CW (with the HG-10B VFO) when you move up to "general". Pi network output circuit enables easy tuneup to any 50-75 ohm load. Drive Level Control, grid-plate current meter, and Drive Tune control enable you to peak up your DX-60B for maximum output, minimum radiated harmonics, best quality audio characteristics. You will not outgrow your DX-60B.

Kit DX-60B, 24 lbs. . . (less crystals) . . . no money dn., $8 mo. . . . **$79.95**
GH-12A, PTT Mike, 1 lb. **$8.50**

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

Ⓒ Heathkit HG-10B VFO . . . Perfect Mate To DX-60B & HW-16

WORK VFO ON 80 THROUGH 2 METERS! Calibrated for "80 through 2," the Heathkit HG-10B provides 5 volts RMS output (enough to drive most transmitters) in the 3.5 to 4, 7 to 7.425 and 8 to 9 MHz ranges. The HG-10B features a 28-to-1 dial drive, plus a "spot" switch for off-the-air tuning. It's the perfect addition to your amateur station when you go from novice to general class.

Kit HG-10B, 12 lbs. . . no money down, $5 mo. **$39.95**

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:** 9⅜" W x 6½" H x 9⅛" D.

1968 Radio Amateur's Handbook

Used all over the world by thousands of hams, engineers, experimenters and students as a reliable, authoritative source of information on almost any phase of electronics and communications. Covers all phases of theory, construction, and 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**



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



HW-16
$109.95

Comes From Heath!

Heathkit HW-16 Novice Rig . . . A High-Performance CW Transceiver

• An unequalled value for the beginning ham • Provides optimum CW operation on the first 250 kHz of the 80, 40, & 15 meter bands • True "break-in" CW operation–solid-state TR switching & receiver muting • 75-watt input power level for novice class CW • Up to 90 watts input power for general class operation • Crystal control transmit with VFO receiver tuning • Provisions for VFO control in "transmit" with the Heathkit HG-10B VFO • High quality crystal lattice filter for CW selectivity comparable to "expensive" receivers • RF amplifier stage in receiver for better than 1 microvolt sensitivity • Built-in sidetone • Grid-block keying–keys beautifully with the Heathkit HD-10 Electronic Keyer • Easy to assemble and put on the air –requires only a VTVM, dummy load, and crystals for the bands in which you intend to operate

NOT JUST FOR THE NOVICE, BUT A HIGH-PERFORMANCE 3-BAND TRANSCEIVER FOR ALL CW OPERATORS. Use the HW-16 at your beginning code speed–the built-in sidetone lets you hear what you send, helps you build up speed, helps you develop a near-perfect fist. And through the added gain of the dual conversion circuit, plus an RF amplifier stage, the HW-16 has the high sensitivity you need for working DX. That RF amplifier means excellent image rejection for "clean" reception and superior weak signal capability. Crystal controlled first conversion oscillators and a low frequency VFO provide maximum frequency stability. You'll appreciate the sharp (500 Hz) selectivity for peeling through crowded nighttime amateur bands provided by the built-in crystal lattice filter. Better than 1 microvolt sensitivity plus a solid state TR switch for automatic antenna change over and receiver muting means real performance. You'll never outgrow your HW-16. You can work fast "break-in" rag chews and high speed traffic nets with ease. Your HW-16 will even outperform many of the "expensive" rigs on CW.

EASY ASSEMBLY GETS YOU ON THE AIR FAST! Layout is open, uncluttered. Solder points are easy to get at. The HW-16 goes together with a combination of circuit board construction and rugged chassis mounting of components that makes simple, straight-forward assembly–assures electrical and mechanical stability. Checkout requires only a VTVM, dummy load and appropriate crystals. Headphones, a key, and an antenna are all you need to get on the air. Who said getting a good start in amateur radio is expensive? Order your HW-16 today.

Kit HW-16, 25 lbs., no money dn., $11 mo. **$109.95**
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 IF Amplifier; 12AX7 Product Detector-Oscillator; 6HF8 1st Audio and Audio Output. **Transistor complement:** 2N1274 muting circuit. **Dimensions:** 13¾" W. x 11½" D. x 6½" H.

Get Your FCC Ham Ticket Fast With This Complete Course

COURSE INCLUDES FOUR HANDBOOKS FROM THE AMERICAN RADIO RELAY LEAGUE: "How To Become A Radio Amateur"; "Radio Amateur's License Manual"; "Learning The Radio-Telegraph Code"; and "Operating An Amateur Radio Station"; plus a Heathkit HD-16 code oscillator kit with key and 3 records that teach code by the revolutionary "word-method."

HDP-22, Complete Amateur Radio Starter Group, 6 lbs., Save $3.00. . . . . **$17.95**
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, 2 lbs. **$9.95**

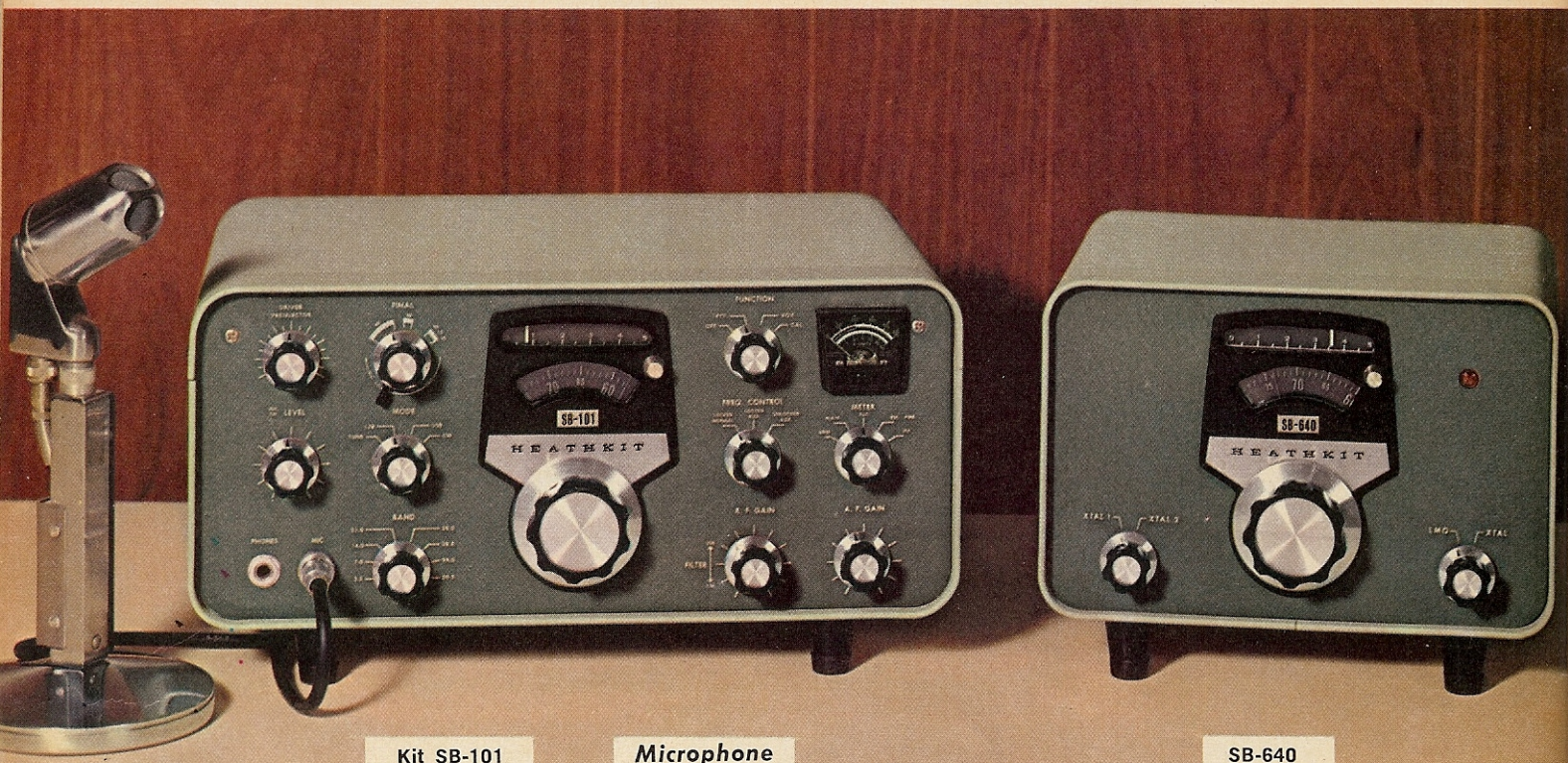
REVOLUTIONARY NEW WORD METHOD to learn RADIO CODE by

HDP-22
$17.95



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

The Heathkit® SB-101 80-10 Meter SSB Transceiver



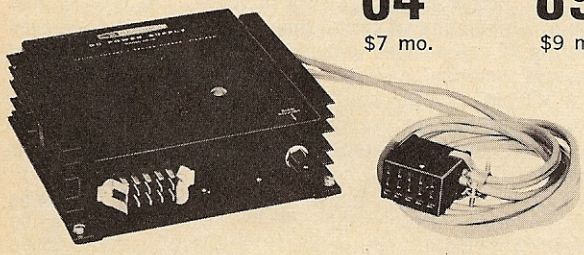
Kit SB-101
$370.00
$22 mo.

Microphone
HDP-21A
$29.40

SB-640
$99.00
$10 mo.

Kit HP-13 **$64.95** $7 mo.

Wired HPW-13 **$89.95** $9 mo.



Heathkit Solid-State Mobile Power Supply For SSB Rigs . . . Kit Or Assembled

ESPECIALLY DESIGNED FOR MOBILE OPERATION OF THE SB-101, SB-110A, HW-100, AND "SINGLE-BANDERS." This Power Supply is actually three DC power sources in one unit. It provides high voltage (800 volts), low voltage (300 or 250 volts), and bias voltage (—40 to —130 volts). It also switches DC filament voltage for the equipment with which it is used. Primary and filament lines are circuit breaker protected.

The power transformer, an epoxy encapsulated toroid unit is of advanced design, assuring maximum efficiency. Long-life silicon rectifiers and heavy duty filter capacitors, mounted on a rugged circuit board, provide trouble free rectification and filtering. Because the complete Power Supply is physically small, it requires a minimum of mounting space.

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:** 7¾" W x 7⅝" L x 2⅜" D. All voltages referenced at 13 VDC input.

Kit HP-23A **$49.95** $5 mo.

Wired HPW-23 **$64.95** $7 mo.



Heathkit Fixed-Station Power Supply For SSB Transceivers With Convenient NEW Features . . . Kit Or Assembled

PROVIDES HIGH VOLTAGE, BIAS, AND FILAMENT POWER FOR FIXED-STATION INSTALLATIONS OF THE SB-101, SB-110A, HW-100, AND "SINGLE-BANDERS." This versatile Power Supply features a high voltage source, switch selection of two low voltage sources, fixed and adjustable bias sources, and 6.3 and 12.6 volt filament sources. Extensive filtering and good regulation is provided for the DC sources.

All controls and connections are located on one side of the chassis for easy, convenient installation into the SB-600 speaker console. A circuit breaker in the primary circuit provides overload and short circuit protection.

Kit HP-23A, AC Supply, 19 lbs. . . no money dn., $5 mo. **$49.95**
Assembled HPW-23, 18 lbs., no money dn., $7 mo. **$64.95**

HP-23A SPECIFICATIONS—Power requirements: 120/240 volts AC, 50-60 Hz, 350 watts maximum. **High voltage output:** 820 volts DC no load; 700 volts DC @ 250 ma. ±10%. AC ripple: Less than 1% @ 250 ma. Duty cycle: 150 ma continuous to 300 ma @ 50%. **Low voltage output:** (High tap) 350 volts DC, no load; 300 volts DC @ 150 ma ±10%. (Low tap) 275 volts DC, no load; 250 volts DC @ 100 ma ±10%. Less than .05% AC ripple @ 150 ma, continuous duty to 175 ma. **Fixed bias:** —130 volts DC, ±10%, no load; —100 volts DC @ 20 ma. **Adjustable bias:** —40 to —80 volts DC @ 1 ma maximum. Less than .5% AC ripple. **Filament voltage:** 6.3 V AC @ 11 amps; 12.6 V AC @ 5.5 amps. **Dimensions:** 9" L x 4¾" W x 6¾" H.

Is the World's Best Value In Sideband Gear

SB-101 80-10 Meter SSB Transceiver Surpasses Every Other Make of SSB Transceiver . . . Regardless Of Price

• 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 transceive • 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 • Kit or assembled • Panel switch selection of USB/LSB filter or optional CW filter • Simplified assembly for kit version • "Unlocked" transmitter frequency control with SB-640 External LMO • Simple alignment—requires only a VTVM or VOM, a dummy load and a broadcast receiver

THE FEATURES & PERFORMANCE OF THE SB-101 MOVES IT 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.

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 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.

OPERATING THE SB-101 IS A REAL PLEASURE. Select the band, dial the frequency, peak-up the preselector, and tune. Receiver and Transmitter bandswitching are simultaneous. The preselector control peaks up the driver. Final tuning is quick, sure, and positive. The optional 400 Hz CW crystal filter adds immeasurably to the ease of receiver tuning during the crowded evening hours. And for CW men who prefer headphone listening, there is a separate headphone level control to adjust the headphone audio level independently from speaker volume. These features plus the separate offset CW carrier crystal and built-in sidetone make the SB-101 as much a leader in CW as in SSB Transceivers.

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.

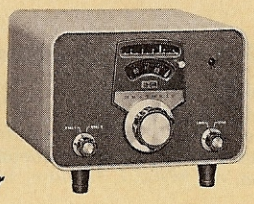
Kit SB-101, 23 lbs., $37 dn., as low as $22 mo. **$370.00**
SBA-301-2, Optional 400 Hz CW crystal filter, 1 lb. **$20.95**
Kit HP-13, DC Power Supply, 7 lbs., no money dn., $7 mo. . . . **$64.95**
Kit HP-23A, AC Power Supply, 18 lbs., no money dn., $5 mo. . . . **$49.95**

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 impedance:** 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 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 ±10% line voltage variations. **Modes of operation:** Selectable upper or lower sideband (suppressed carrier) and CW. **Dial accuracy—"resettability":** Within 200 Hz on all bands. **Electrical dial accuracy:** Within 400 Hz after calibration at nearest 100 kHz point. **Dial mechanism backlash:** Less than 50 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:** 14⅞" W x 6⅝" H x 13⅜" D.

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.

SB-640
External Linear Master Oscillator For Versatile Frequency Control Of Heathkit SB-101 SSB/CW Transceiver



• 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

THE SB-640 & SB-101 MAKE AN UNBEATABLE PAIR. With this combination, you can transceive on this External LMO, on the internal LMO of the Transceiver, or on either of two crystal frequencies. You can also receive on the Transceiver's LMO and transmit on the external LMO. All of these functions are switch-selected from the front panels of the instruments. The SB-640 provides wide versatility for working DX stations in a different sub-band, or for the customary procedure of calling 5 or 10 kHz up or down from the DX station's frequency. You can work a net by transceiving on a crystal frequency, by using either LMO, or by transmitting crystal controlled and receiving on LMO.

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 ±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:** 6⅝" H. (plus feet) x 10" W x 11⅜" D. (including knobs).

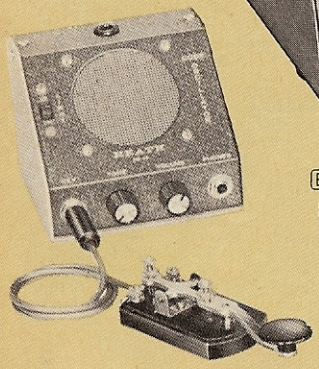
Open Your Heath Account—No Money Down—Up To 18 Months To Pay—See Order Blank For Details

Amateur Radio Accessories

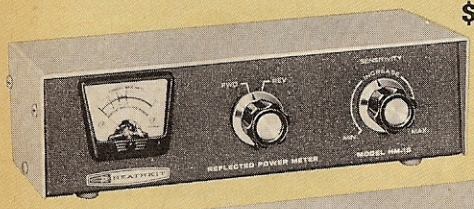
Ⓐ HD-10
$39.95
$5 mo.

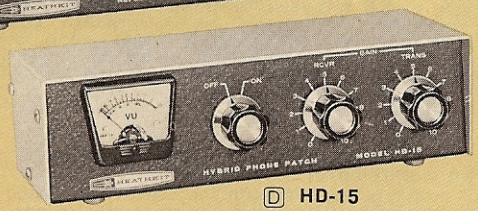


Ⓑ HD-16
$9.95



Ⓒ HM-15
$14.95



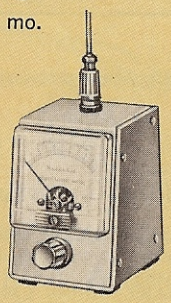


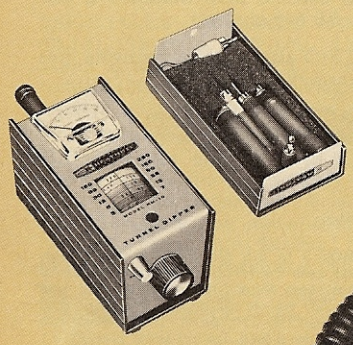
Ⓓ HD-15
$24.95
$5 mo.

Ⓔ HD-20
$14.95

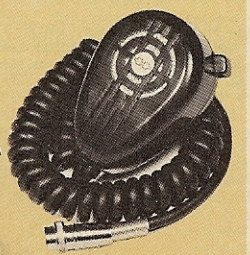


Ⓕ PM-2
$12.95





Ⓖ HM-10A
$29.95
$5 mo.



Ⓗ GH-12A
$8.50

Ⓐ *Heathkit Solid-State Electronic Keyer*

• Dependable solid-state circuitry • Speed range—15 to 60 words per min., Slow-speed option—10 to 20 wpm • Self-completing dashes • Solid-state switching—no relays to stick or chatter—no contact bounce to punch holes in characters • Built-in paddle—"feel" is adjustable to your fist during assembly • Adaptable to either right or left handed operators • Engineered to convert easily to semi-automatic operation if desired • Variable dot-space ratio • "Hold" switch for transmitter tuning • Built-in side-tone and speaker • Built-in transformer-operated power supply isolates the keyer from the power line • Fused for protection • For use only with transmitters employing grid-block keying circuits, negative 105 volts @ 35 ma. maximum

Kit HD-10, 6 lbs., no money dn., $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:** 3¾" W x 4¼" H x 10½" D.

Ⓑ *Heathkit Solid-State Code Practice Oscillator*

HD-16 UTILIZES A UNIJUNCTION TRANSISTOR WITH SEPARATE CONTROLS TO VARY TONE FREQUENCY AND VOLUME. Speaker is built in and jack for headphones is provided on front panel. For visual monitoring, just flip the front panel switch and watch the top-panel blinker light. Includes key with phone plug and cord. Requires two 9 volt transistor radio batteries and one "C" flashlight cell.

Kit HD-16. 3 lbs. **$9.95**

Ⓒ *Heathkit SWR Meter—Get More Efficiency From Your Rig*

• Shows antenna/transmission line match—indicating forward & reflected power & SWR • Covers 160-6 meters • Handles peak power well over 1 kw • Matches 50 or 75 ohm lines with wiring options • Styled to match SB-Series equipment

Kit HM-15, 2 lbs. **$14.95**

HM-15 SPECIFICATIONS—Operation: Indicates percentage of reflected power to 25%, and voltage standing wave ratio (SWR) to 3. **RF Power Handling Capability:** One kilowatt. **Input and Output Impedance:** 50 or 75 ohm. **Band Coverage:** 160 through 6 meters. **Meter:** 100 microamperes, full scale. **Dimensions:** 9¼" L x 3⅝" W x 2⅝" H.

Ⓓ *Heathkit Hybrid Phone Patch—A Useful Addition To Any Shack*

• Features individual gain controls for receiver-to-line and line-to-transmitter audio level • Convenient one-switch operation • VU meter for quick monitoring of audio levels; also indicates null depth • 30 dB isolation between transmit and receive circuits for positive VOX operation • Matches 3-16 ohm speakers and hi-Z or 600 ohm inputs • Operates VOX or PTT • Matches SB-Series equipment in styling

Kit HD-15, 3 lbs., no money dn., $5 mo. **$24.95**

Ⓔ *Heathkit 100 kHz Crystal Calibrator*

Produces a signal every 100 kHz through 54 MHz. An ideal instrument for checking receiver dial calibration, band limits, receiver RF alignment etc. Can be calibrated with trimmer against WWV. Uses 9 v. battery, not included.

Kit HD-20, 1 lb. **$14.95**

Ⓕ *Heathkit RF Relative Power Meter*

A popular, inexpensive accessory for any "ham." The PM-2 features 0.3 volt RMS sensitivity at the antenna and a frequency range from 100 kHz to over 250 MHz. The circuit requires no power . . . operates from the radiated transmitter signal. The magnetic base makes it ideal for measuring the relative power output of mobile rigs—just mount on the dash. Easy assembly and rugged construction.

Kit PM-2, 2 lbs. **$12.95**

Ⓖ *Heathkit Solid-State "Tunnel Dipper"*

• Tunnel diode oscillator—no tubes • Covers frequency range of 3 to 260 MHz • Gear-drive tuning • Durable epoxy-coated plug-in coils • Coils color-matched to dial scales • Built-in coil storage

Kit HM-10A, (less battery), 3 lbs. . . 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) T1363 DC amplifier; (1) tunnel diode, oscillator; (1) crystal diode, rectifier; (1) silicon diode, voltage stabilizer. **Meter:** D'arsonval type, 0-1 ma full scale. **Power requirements:** 1.5 volts @ 5 ma. **Battery:** 1 AA penlite cell (not included). **Dimensions:** 5⅞" L x 2 13/16" W x 4 3/16" H (cover closed).

Ⓗ *Heathkit Mobile PTT Mike*

Featuring a special "shaped" response for voice frequencies, the GH-12A's high impedance ceramic element is well suited to the rugged work-out given to mobile equipment . . . it is virtually unaffected by the temperature extremes that sometimes occur in closed cars. The new deep green color styling matches both SB and HW Series equipment. Complete with cable, less connector.

Model GH-12A, 2 lbs. **$8.50**

Heathkit Performance Specifications Are Guaranteed



World's Most Advanced 6-Meter SSB Transceiver

Heathkit SB-110A . . . The Only "No Compromise" Six Meter SSB Transceiver

• The only truly high-performance SSB transceiver on six meters • Uncompromised engineering–the SB-110A features the same high quality crystal lattice filter found on Heathkit 80–10 Meter SB-Series rigs • The same Heath LMO (Linear Master Oscillator) found on 80–10 meter SB-Series rigs • Full SSB-CW transceive operation on Six meters • 180 watts PEP SSB–150 watts CW input • Switch select for Upper Sideband/Lower Sideband/CW operation • Operates PTT & VOX • Separate offset CW carrier crystal for clear, pure CW note • ALC and ANL • Built-in 100 kHz calibrator • Built-in antenna switching • Covers 50-52 MHz with crystals supplied–total coverage 49.5-54 MHz • One kHz dial calibrations–bandspread equal to ten feet per megahertz • Fixed station or mobile power supplies

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-110A 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-110A.

Kit SB-110A, 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-23A, AC Power Supply, 19 lbs. . . no money dn., $5 mo. . . . **$49.95**
Kit SBA-100-1, Mobile Mounting Kit, 6 lbs. **$14.95**

SB-110A SPECIFICATIONS—RECEIVER SECTION: Noise Figure: 3 db or less. **Sensitivity:** 0.1 uv for 15 db signal-plus-noise to noise ratio. **Selectivity:** 2.1 kHz @ 6 db down, 5 kHz max. @ 60 db down. **Image Rejection:** 50 db or better. **IF Rejection:** 50 db or better. **Antenna Input Impedance:** 50 ohm nominal (unbalanced). **Audio Output Impedance:** Speaker, 8 ohms. Headphones, 600 ohms or higher. **Audio Output Power:** 1 watt. **AGC Characteristics:** Audio output level varies less than 10 db for 50 db change of input signal level (0.5 uv to 150 uv). **TRANSMITTER SECTION: DC Power Input:** SSB, 180 watts PEP. CW, 150 watts PEP. **RF Power Output:** SSB, 100 watts PEP. CW, 90 watts (50 ohm non-reactive load). **Output Impedance:** 50 ohm nominal with not more than 2:1 SWR. **Carrier Suppression:** 55 db down from rated output. **Unwanted Sideband Suppression:** 55 db down from rated output @ 1000 Hz & higher. **Distortion Products:** 30 db down from rated PEP output. **Harmonic Radiation:** 35 db below rated output. **Hum & Noise:** 40 db or better below rated carrier. **Audio Input:** .007 v. minimum for rated input. **CW 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:** 14⅞" W x 6⅝" H x 13⅜" D.



HDP-21A
$29.40

Special SSB "Ham Radio" Microphone With Desk Stand

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
$14.95

Universal Mobile Mounting Bracket For SB-110A & SB-101

GO MOBILE WITH THE SB-110A OR SB-101. The SBA-100-1 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**

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



Heathkit® SB-Series Sets "The-State-Of-The-

Heathkit SB-301 Amateur Band Receiver With Pace-Setting Extra-Performance Features

• 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 • Bandspread 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**
SBA-301-2 Optional CW crystal filter (400 Hz), 1 lb. **$20.95**

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 ±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:** 120/240 V. AC, 50/60 Hz, 50 watts. **Dimensions:** 14⅞" W x 6⅝" H x 13⅜" D. **Net weight:** 17 lbs.

Heathkit SB-Series Communications Speaker

OFFERS FIXED-STATION "SPEAKER" FACILITIES IN HANDSOME SB-SERIES STYLING. Now you can complete your SB-Series station with this complementary communications speaker. The SB-600 provides the necessary 8 ohm impedance to match the audio output from Heathkit SB-Series and HW-Series equipment. Its audio response is shaped to 300 to 3000 Hz for optimum reproduction of voice frequencies. And for Heathkit Transceiver owners, it provides mounting enclosure for the "remote" HP-23 power supply. Cabinet size is identical to SB-620, SB-640, etc. . . . 10" W x 6½" H x 10½" D.

Kit SB-600, 6 lbs. **$18.95**

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-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 48 to 54 MHz. **Image rejection:** 50 db or better @ 6 MHz. **IF rejection:** 40 db or better @ 28 MHz. **Crystal:** 22 MHz ±0.005%, 3rd overtone. **Tube complement:** 6DJ8 cascode RF amplifier, 6EA8 oscillator-mixer. **Power requirements:** 120 v. @ 12.5 millamperes, 6.3 v. AC @ 815 milliamperes. **Dimensions:** Overall, 2⅜" W x 5¾" L x 3¾" 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 ±.003%, 3rd overtone. **Tube complement:** 6DJ8 cascode RF amplifier, 6EA8 oscillator-tripler-mixer. **Power requirements:** 130 V. DC @ 12.5 millamperes, 6.3 V. AC @ 815 milliamperes. **Dimensions:** Overall, 2⅝" W x 5¾" L x 3¾" H.



SB-401
$285.00

Kit SB-200
$220.00

Art" For Engineering, Performance & Value

Heathkit SB-401 Amateur Band Transmitter Operates USB/LSB & CW. . . "Separate" Or "Transceive"

• Single panel switch selects transceive or independent operation of SB-401 and 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 bandswitch 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 subpack" 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**

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. 107 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 @ 120/240 V. AC, 50/60 Hz. **Dimensions:** 14⅞" W x 6⅝" H x 13⅜" 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.

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:** 14⅞" W x 6⅝" H x 13⅜" D. **Net weight:** 35 lbs.

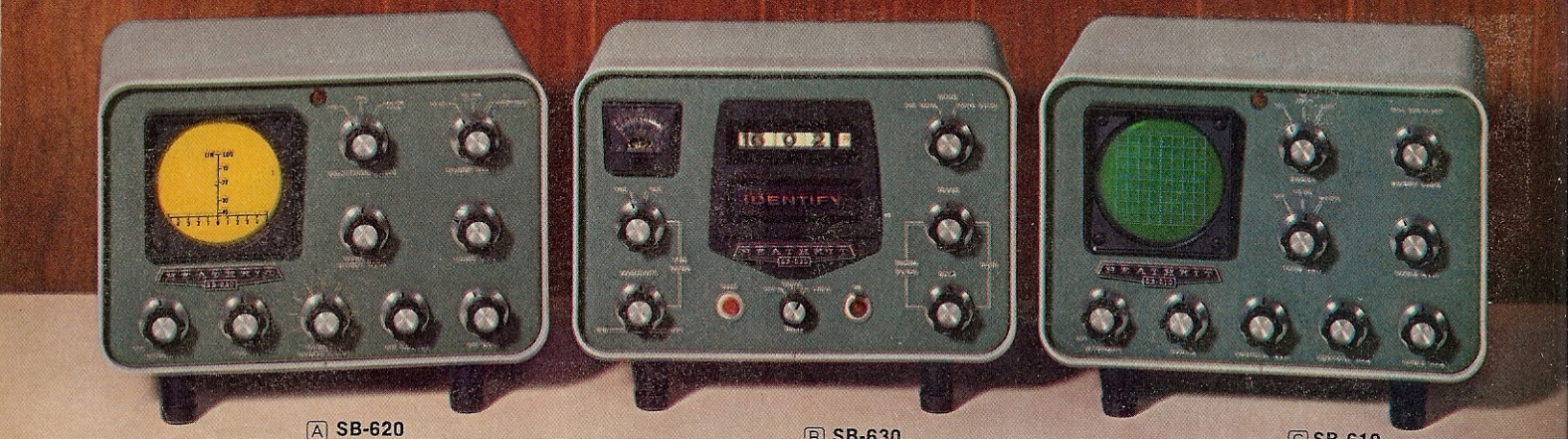
Heathkit "Cantenna" Transmitter Dummy Load



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 noninductive 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...For The Performance-Minded Ham



Ⓐ SB-620
$119.95

Ⓑ SB-630
$74.95

Ⓒ SB-610
$74.95

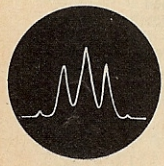
Ⓐ *Heathkit SB-620 "Scanalyzer" Broad Band Spectrum Monitor And Signal Analyzer*

• 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 • 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

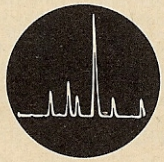
"SCANALYZER" IS THE MOST MODERN, CAPABLE AMATEUR RADIO SPECTRUM ANALYZER ON THE MARKET TODAY. Provides quality instrumentation for the amateur radio station. The scanalyzer displays up to 500 kHz of the spectrum for wideband scanning function (250 kHz either side of center tuned frequency) . . . allows 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 ½ 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:** 6½" H x 10" W x 10½" D. **Net weight:** 10 lbs.



Analyzing Function—10 kHz preset sweep width—indicate carrier 100% modulated by 2 kHz time-log scale.



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.

Ⓑ *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

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**

Ⓒ *SB-610 Signal Monitor . . . Accurately Displays Transmitted & Received AM, CW, RTTY & SSB Signals 160 Thru 6 Meters*

• 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 • 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 SB-610 Signal Monitor is designed to operate without modification with all your SB-Series amateur equipment, providing the ultimate in performance for ham radio monitor scopes . . . plus, it has all necessary circuit provisions for operation with most other gear on the market today.

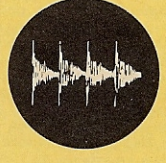
Kit SB-610, 14 lbs. . . no money dn., $8 mo. **$74.95**

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 ½ amp. **Power requirements:** 120/240 V. AC, 50/60 Hz, 35 watts. **Dimensions:** 6" H x 10" W x 11⅛" D (including knobs).

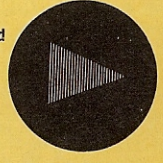
Displays Actual Signal Waveforms

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.



Use Heath's Free Technical Consultant Service—Write Them On Any Kit Subject

Heathkit® 80, 40 & 20 Meter Gear

HEATHKIT®



Heathkit Single-Banders Have More Performance, Better Looks, Yet Cost Less

• Fixed or mobile operation with the appropriate power supply (HP-23A or HP-13) • Electronically stable, easy-to-assemble circuit board construction • Time-saving wiring-harness cable assemblies • Durable wrinkle finish • Upper Or Lower sideband operation on all Single Banders • Choose 80, 40, or 20 meter model • Convenient control locations • 200 watts P.E.P. input • Single knob tuning with 2 kHz dial calibration • ALC input for use with external linear amplifiers • Excellent exciters for operation on the band of your choice with the SB-200 Linear Amplifier • Superior audio & AVC repsonse • Crystal filter type SSB generation • Built-in S-meter, VOX, PTT, and ALC

AN IMPROVED VERSION OF THE SSB TRANSCEIVER THAT OPENED UP A NEW ERA IN AMATEUR RADIO. The number of Single-Banders you hear on the air is proof of their popularity . . . yet to bring you even greater economy and performance Heath improved on these favorite "Hard Working" transceivers. These are truly high-performance transceivers that get you on the air on the band of your choice with a full 200 watts P.E.P. input SSB—either fixed or mobile.

UP-TO-DATE ENGINEERING, UNCLUTTERED STYLING, COMPACT SIZE. Microphone input and gain control are located on the front panel as is the bias adjustment for ease in changing from fixed to mobile operation. A function switch position controls the optional HRA-10-1 crystal calibrator. The 11 pin power plug is compatible with SB Series power supply connections. The receiver is a 10-tube 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 with the temperature-compensated 1.5 to 1.8 MHz VFO. The high quality crystal lattice filter produces identical tuning characteristics for both upper and lower sideband signals—for clean transmitted signals with the carrier and unwanted sideband at least 45 dB down. Here is the performance you expect in "high priced" equipment.

DESIGNED FOR EASY ASSEMBLY. Over 90% of the components mount on a heavy-duty circuit board, and the remainder of the circuit is connected with a pre-cut wiring harness. Alignment is easy. The only other gear you need to get on the air are microphone, antenna, power supply, and speaker. (See amateur radio accessories.)

Kit HW-12A: 80-meter, 15 lbs. . . 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-12A, Push-to-talk and VOX microphone, 1 lb. **$8.50**
Kit HRA-10-1, Plug-in 100 kHz crystal calibrator. . . 1 lb. **$8.95**
Kit HP-13, DC Power Supply (Mobile), 7 lbs. . .
no money dn., $5 mo. **$64.95**
Kit HP-23A, AC Power Supply (Fixed Station), 18 lbs. . .
no money dn., $5 mo. **$49.95**
Kit HS-24, Mobile Speaker, 4 lbs. **$7.00**

SPECIFICATIONS—RF input: 200 watts PEP. **Sideband generation:** Crystal lattice bandpass filter method. **Stability:** 200 Hz per hour after warm-up. **Carrier & unwanted sideband suppression:** 45 dB. **Frequency coverage:** HW-12A, 3.8—4.0 MHz; HW-22A, 7.2—7.3 MHz; HW-32A, 14.2—14.35 MHz. **Receiver sensitivity:** 1 uV for 15 dB (S+N)/N ratio. **Receiver selectivity:** 2.7 kHz @ 6 dB, 6.0 kHz @ 50 dB. **Output:** 50 ohm fixed (unbalanced). **Operation:** LSB, USB. **Audio output:** 1 watt @ 8 ohms. **Mike input:** Hi-Z. **Tube complement:** Fourteen tube heterodyne circuit; (3) 6EA8's, mic. amp., VOX relay amp., IF amp., RF amp., Recvr. mixer; (5) 6AU6's, VFO, VOX amp., IF amps., Xmtr. 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:** 6¼" H x 12¼" W x 10" D.

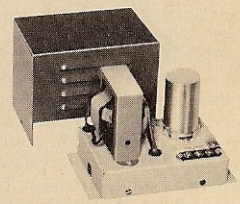


Famous Low-Cost "Benton Harbor Lunch Boxes" Compact 6 & 2 Meter Transceivers

• 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 tranceivers, 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:** 4⅝" H x 6½" W x 4⅛" D.

CAP, MARS & 160 Meter SSB Transceivers

A unique series of low cost crystal-controlled SSB transceivers especially designed for use by CAP, MARS, and 160 meter hams



Kit HW-18-1
CAP
$119.95
(including crystals)

Wired HWW-18-1
CAP
$179.95
(including crystals)

Kit HW-18-2
MARS
$109.95
(less crystals)

Kit HW-18-3
160 meters
$109.95
(less crystals)

The Heathkit HW-18 Series . . . 2-Channel, 200-Watt SSB Transceivers

• 200 watts PEP SSB input • 25 watts input with carrier for compatibility with AM stations • CAP version employs upper sideband, MARS upper or lower sideband, 160 meter model lower sideband • CAP complies with new FCC rule effective June 21, 1968 which establishes a CAP SSB frequency tolerance of .005% until Jan. 1, 1973 and 50 Hz thereafter • Crystal filter sideband generation • 2 channels, switch selected, crystal controlled (tolerance .005%) • Fixed tuned for simple PTT operation • Transmit and receive frequencies locked together for true transceiver operation • Clarifier control adjusts transceiver frequency ±100 Hz • Relayless transmit-receive switching • Local-Distance switch prevents receiver overload from strong local stations • Built-in speaker • PTT mic. included • Carrier & sideband suppression 45 dB • Sensitivity 1 uv • Selectivity 2.1 kHz • 50 ohm coax output • Mobile or "fixed" use • HP-13 & HP-23A power supplies (See amateur accessories) • Mobile mount included

GOOD NEWS FOR CAP, MARS, AND 160 METER OPS. Now there is a special series of Heathkit SSB transceivers designed with your needs in mind, priced with your budget in mind. No more adapting commercial rigs, no more converting surplus military gear, no more make-shift set-ups. The new Heathkit HW-18 series is tailored just for you with the sensitivity, selectivity, power output, and operating convenience that make for effective, efficient communication at a fraction of the costs you've had to pay in the past.

COMPARE THE FEATURES, COMPARE THE CONVENIENCE, COMPARE THE PERFORMANCE. Power that speaks with authority . . . 200 watts of peak envelope power input on single sideband provides talk-power equal to 800 watts AM input . . . and for compatibility with stations equipped with AM receivers only, just flip a switch to insert carrier. And nothing is easier to operate . . . just select the channel and pick up the microphone . . . no power amplifier tuning, no loading adjustments, no receiver tuning. Automatic Level Control (ALC) holds the transmitter output constant under varying voice levels . . . the built-in meter checks ALC as well as transmitter plate current and received signal strength. Trimming capacitors provide easy, exact adjustment of transmitter frequency.

SENSITIVE, MODERN RECEIVER. No drifting off channel with this one, for transmitter and receiver frequency are crystal-controlled, locked together, always on the same frequency, always on the same sideband. And the Clarifier Control corrects the transceive frequency within the .005% tolerance to assure accurate "netting." The crystal filter IF provides the high selectivity needed to eliminate adjacent channel interference. The product detector provides clear SSB reception with no control juggling. The Local-Distance switch prevents overloading of the receiver by nearby net stations. Best of all . . . the sensitivity of 1 microvolt for a 15 dB S+N/N ratio means solid copy every time. So easy to use that all that's required is to release the push-to-talk button on the microphone to hear the reply . . . even a 4" x 6" speaker is built-in.

12 TUBE CIRCUIT, 17 TUBE FUNCTION. Multi-section tubes keep the number of tubes low, yet provide the functions required for a sophisticated transceiver. Nearly everything except the front panel controls mount on one large circuit board for fast, easy construction and a wiring harness makes interconnections simple.

ALIGNMENT REQUIRES ONLY A VOLTMETER, OHMMETER AND DUMMY LOAD. Circuit may be powered by HP-13 DC supply for mobile use or HP-23A AC supply for fixed station operation. Whether you operate CAP, MARS, or 160 meters, this HW-18 series provides fine performance fixed-frequency SSB facilities at the lowest cost anywhere. Order yours now.

Kit HW-18-1, CAP transceiver and crystals for any two channel frequencies from list below; specify choices; 16 lbs., no money dn., $11 mo. **$119.95**

Assembled HWW-18-1, ready to operate CAP transceiver with crystals for any two channel frequencies from list below; specify choices; 16 lbs., no money dn., $17 mo. **$179.95**

CAP CRYSTALS; channel frequency: 4467.5, 4507.5, 4585, 4602.5, 4630 kHz; 1 lb. . . . . ea. **$4.95**

Kit HW-18-2, MARS transceiver less channel crystals, 16 lbs., no money dn., $11 mo. **$109.95**

MARS CRYSTALS; specify LSB or USB operation & channel frequencies (both channels must use same sideband); 4451.5, 4518.5, 4558.5, 4581.5, 4591.5, 4595 kHz; 1 lb. . . . . ea. **$4.95**

Kit HW-18-3, 160 M transceiver less crystals, 16 lbs., no money dn., $11 mo. **$109.95**

160 METER MODEL HETERODYNE CRYSTALS for operation on: 1805, 1809, 1813, 1817, 1821 kHz; 1 lb. . . . . ea. **$4.95**

HW-18 SERIES SPECIFICATIONS—RECEIVER SECTION: Frequency coverage: HW-18-1 & 2, 4450 to 4650 kHz; HW-18-3, 1800 to 2000 kHz. **Channels:** 2. **Sideband:** HW-18-1, USB; HW-18-2, USB or LSB option; HW-18-3, LSB. **Clarifier range:** HW-18-1 & 2, ±100 Hz; HW-18-3; ±250 Hz. **Sensitivity:** All models, 1 uV input signal will provide at least a 15 dB signal-plus-noise to noise ratio. **Selectivity:** 2.1 kHz nominal @ 6 dB down, 6 kHz @ 50 dB down (3395 kHz filter). **Intermediate frequency:** All models, 3395 kHz. **Image rejection:** 100 dB. **IF Rejection:** 50 dB. **Antenna input impedance:** 50 ohm, unbalanced. **Receiver audio response:** 400 to 3000 Hz. **Receiver audio power output:** 1 watt. **Internal speaker:** 8 ohm impedance 4" x 6". **TRANSMITTER SECTION: Frequency coverage:** HW-18-1 & 2, 4450 to 4650 kHz; HW-18-3, 1800 to 2000 kHz. **Channels:** 2. **Transmitting mode:** HW-18-1, upper sideband carrier suppressed, and low level carrier with sideband. HW-18-2, upper or lower (optional) sideband carrier suppressed, and low-level carrier with sideband. HW-18-3, lower sideband. **Frequency accuracy:** HW-18-1 & 2, .005% overall (after adjusting to channel frequency). HW-18-3, .005%. **Clarifier range:** HW-18-1 & 2, ±100 Hz; HW-18-3, ±250 Hz. **RF Power input:** 200 watts PEP. **Output impedance:** 50 ohm, unbalanced. **Transmitter audio response:** 400 to 3100 Hz. **Microphone:** High impedance ceramic. **Unwanted sideband suppression:** 45 dB min. below peak output with 1000 Hz modulation. **Carrier suppression:** 45 dB min. below peak output. **Ambient temperature range:** +10° to +110°F. **Controls: Front panel:** Volume with on/off switch, Reception, Mode, Meter, Channel, Clarifier, Meter Zero, Bias Adjust. **Circuit board:** Carrier null. **Chassis rear:** Mic. gain. **GENERAL SPECIFICATIONS: Power requirements:** 800 VDC @ 250 mA peak, 250 VDC @ 100 mA, —130 VDC @ 5 mA, 12.6 VAC or VDC @ 3.75 amperes. **Tube complement:** (3) 6EA8 microphone amp & AF cathode follower, transmitter IF amp & relay amp, RF amp & receiver mixer; (4) 6AU6 heterodyne osc., IF amps (2), transmitter mixer; (1) 12BY7 transmitter driver; (1) 12AT7 prod. detector & carrier osc.; (1) 6EB8 AF amp & AF output; (2) 6GE5 transmitter RF output. **Cabinet dimensions:** 6¼" H x 12¼" W x 10" D. Add 1" to height, width, & depth for gimbal bracket, knobs & connecting plugs. **Net weight:** 12 lbs.

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

New Solid-State 2-Meter AM Transceiver

THROUGH HEATH NEW RESEARCH

This New Heathkit HW-17 Solid-State 2-Meter AM Transceiver Is Just Right For Local Rag-Chews, Nets, and DX, as well as CAP, MARS, and Coast Guard Auxiliary Use . . . Sensitive Receiver, Reasonable Power Output, Easy-To-Use Features, and a Low Price



HW-17
$129.95

• Frequency Range 143.2 to 148.2 MHz • Solid-state, dual-conversion superheterodyne receiver • Pre-built, pre-aligned FET tuner • Spot function for finding transmit frequency on receiver dial • Hybrid transistor-tube type transmitter design • 8 to 10 watts power output • 4 crystal sockets plus provision for external VFO such as Heathkit HG-10B (page 40) • Built-in 120-240 VAC power supply • Optional DC mobile supply (see below) • PTT operation, electronically switched • Front panel meter for signal strength and relative power output • Built-in automatic noise limiter and squelch • Lighted dial • Built-in speaker • Battery saver feature for low current drain during mobile monitoring • Low profile aluminum cabinet for easy mobile mounting • Gimbal mount included for mobile use • Ceramic PTT microphone included • 15 transistors, 20 diodes, 3 tubes, 2 circuit boards • Builds in about 20 hours

The Heathkit HW-17 in detail. It's really a separate receiver and transmitter in one compact, versatile package (the only common circuitry are the power supply and the audio output/modulator). Frequency coverage is 143.2 to 148.2 MHz. The solid-state dual conversion, superheterodyne receiver with a pre-built, pre-aligned FET tuner has a lighted dial with 100 kHz calibration, automatic noise limiter, squelch, and 1 uV sensitivity. Selectivity is 27 kHz at 6 dB down, a figure that's consistent with band occupancy and easy receiver tuning. The front panel meter indicates received signal strength and relative power output. A 3-position switch on the front panel has a "Spot" position for finding the transmit frequency on the tuning dial, a Receive/Transmit position, and a Battery-Saver position that comes in handy during those long periods of monitoring while mobile (the receiver draws only 100 mA during this time). A 3″ x 5″ speaker is built in.

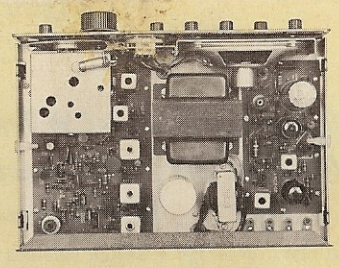
On the transmitting end is a hybrid circuit including transistors and tubes with a 25 to 30 watt power input and an AM power output of 8 to 10 watts. Modulation is automatically limited to 100% or less. A front panel selector switch chooses any of four crystal frequencies or an external VFO (the Heathkit HG-10B VFO is perfect for this job).

Front panel controls include Final Load, Final Tune, Crystal-VFO switch, Main Tuning, Squelch with ANL switch, Battery Saver-Receive/Transmit-Spot switch; rear panel has S-meter Adjust, Headphone jack, Power socket, VFO power socket, VFO input, and Antenna connector (50-72 ohms, unbalanced).

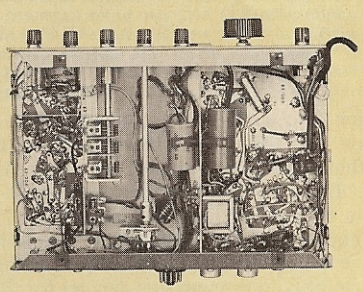
The 15 transistor, 20 diode, 3 tube circuit is powered by a built-in 120/240 VAC supply. Circuit board construction averages 20 hours. It's all housed in a low-profile Heath gray-green aluminum cabinet measuring 14⅛″ W x 6⅛″ H x 8½″ D with everything in place. A ceramic PTT mic. and a gimbal bracket for mobile mounting are included.

Move up to 2 meter 'phone operation this new low cost way with the Heathkit HW-17.

Kit HW-17, 2M Transceiver, 17 lbs. **$129.95**
Kit HWA-17-1, Transistorized DC supply, 5 lbs. **$24.95**

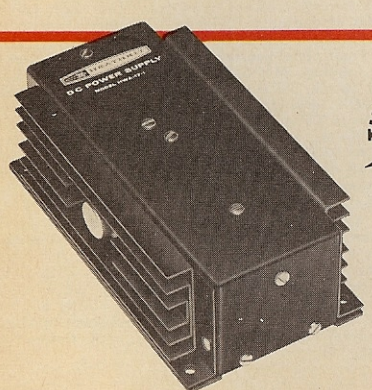


Separate Receiver and Transmitter . . . with a separate circuit board for each . . . sharing only the husky power supply and audio output/modulator stage.



Compartmentalized Chassis Construction . . . each function area is shielded for the high stability required at these frequencies.

HW-17 SPECIFICATIONS—RECEIVER: Frequency coverage: 143.2-148.2 MHz. **Dial calibration:** 100 kHz. **IF Frequencies: Double conversion:** 1st IF: 24.965 MHz; 2nd IF: 2 MHz. **Sensitivity:** 1 uV input for 10 dB S/N + N. **Selectivity:** 27 kHz @ 6 dB down. **Input impedance:** 50-72 ohm, unbalanced. **Audio output:** 1 watt @ less than 10% distortion. **Headphone jack:** Low impedance, accepts PL-55 type plug (standard 2-conductor ¼″ sleeve). **Transistor complement:** (2) 2N4416 RF Amplifier, 1st Mixer; SE5023 HF variable oscillator; (4) 2N3694 2nd Mixer, crystal oscillator, 1st IF amplifier, 2nd IF amplifier; (2) 2N3393 Audio Preamplifier, Squelch amplifier X29A829 Squelch Gate; 2N1274 Audio Driver; (2) 40050 Audio/Modulator output. **Transmitter: Frequency coverage:** 143.2-148.2 MHz. **RF Power input:** 25-30 watts. **RF Power output:** 8-10 watts. **Mode:** Type A3 (AM). **Modulation:** Automatically limited to 100% or less. **Output Impedance:** 50-72 ohm, unbalanced. **Crystal sockets:** Accepts FT-243 type holders, pin diameter .093″, pin spacing .466″ & HC6/U type in diameter .050″, pin spacing .466″. **Transistor/tube complement:** 7050 Oscillator/Amplifier Tripler-Tripler; 12GN7 Doubler/Driver; 8156 Power Amplifier; (2) 2N3393 Microphone Preamplifier, Microphone Driver. **Temperature range:** —20° to +50° C. **Power requirements:** 120 or 240 VAC input. Receiver Trans.—.20 watts; Batt. Saver—8 watts; Spot—35 watts; Transmitter—100 watts. **Cabinet dimensions:** 14⅛″ W x 8½″ D x 6⅛″ H including microphone & mounting feet. **Net weight:** 13 lbs.



THROUGH HEATH NEW RESEARCH

HWA-17-1
$24.95

New Solid-State DC Power Supply For HW-17 2-Meter AM Rig

If you are going mobile with your new Heathkit HW-17 2-Meter transceiver, you'll need this compact little power supply. Designed especially for this use, the HWA-17-1 supplies all the voltages required by the HW-17. Its solid-state circuit uses a "C" core transformer for reliable, efficient operation. Big heat sinks assure cool operation with a duty cycle of 50%. Circuit breaker protection guards your mobile battery source. All cables and connectors are included and its small size makes it easy to install anywhere on car or boat.

Kit HWA-17-1, 5 lbs., no money dn., $5 mo. **$24.95**

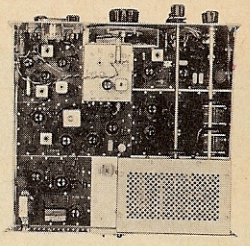
HWA-17-1 SPECIFICATIONS—Input voltage: 12 to 15 volts DC (Note: a 13.5 volt DC input was used in determining the electrical specifications.). **Input current:** 10 amperes maximum. **Allowable ambient temperature:** 10 degrees F. to 122 degrees F. **High voltage output:** 380 VDC no load, 340 VDC at 150 mA load. **Ripple:** 1% at 150 mA. **Duty cycle:** 50%. **Conversion frequency:** 2500 Hz (approx.). **Dimensions:** 3⅞″ W x 7-5/16″ L x 2½″ H. **Net weight:** 3 lbs.

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

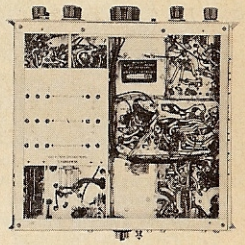
Low Cost 5-Band SSB-CW Transceiver



HW-100 **$240.00** no money dn., $22 mo.



Top View of the HW-100 . . . shows the neat layout provided by the five circuit boards which mount on the top of the chassis. Note the completely enclosed VFO and shielded Final Amplifier.



Bottom View of the HW-100 . . . shows the four vertical circuit boards with band switch wafers and crystals mounted directly on the boards. Final Amplifier bandswitch is located in its own shielded compartment.

The Heathkit HW-100 Five-Band SSB-CW Transceiver . . . with all the features and performance of competitive brands . . . at a money-saving kit price

THROUGH HEATH NEW RESEARCH

• Solid-state (FET) VFO • 80-10 meter coverage • Switch selected upper or lower sideband or CW • 180 watts input PEP SSB—170 watts input CW • Crystal filter • Full coverage on all bands with 500 kHz per band segment • Smooth vernier control of frequency with patented Harmonic Drive™ dial mechanism • Built-in 100 kHz calibrator • Separate offset CW carrier crystal • TALC • Quiet, enclosed relays • Fixed or mobile operation with HP-23 or HP-13 power supplies • Easy assembly with circuit boards and wiring harness

This is what you asked for . . . a five-band version of the Heathkit "single-banders" . . . a low cost SSB transceiver for 10 or 15 meters . . . an SSB transceiver that's equal or superior to many wired rigs, but at much lower cost. It's the HW-100 five-band SSB rig with everything it takes to leave the rest of the field behind.

How did we do it? We expanded on the Heathkit "single-banders," borrowed from the heritage of the SB-101, took a look at the competition, and produced the most SSB equipment you can get for the money.

Here's what its got. You can check the specs. and be impressed, but in general, the HW-100 operates with a hybrid circuit that uses 20 tubes (26 functions), two transistors (one an FET for the VFO), six germanium diodes, nine silicon diodes, and one Zener diode. Everything but the VFO, final amplifier, and various controls mount on nine circuit boards for stable, dependable, easy-to-build circuitry.

Here's what it delivers. The receiver portion of the HW-100 has a sensitivity figure of less than ½ uv for a 10 dB S+N/N ratio for SSB operation. Crystal filter selectivity is 2.1 kHz at 6 dB down, 7 kHz at 60 dB down. Image and IF rejection better than 50 dB.

The transmitter section in SSB continuous duty is 180 watts PEP, CW input is 170 watts on 50% duty cycle. It operates PTT or VOX on SSB, and CW transceive is provided by operating VOX from a keyed tone, using grid-block keying. CW side-tone is 1 kHz, internally switched to speaker or headphones. Carrier and unwanted sideband suppression is 45 dB down; third order distortion 30 dB down, RF compression (TALC) is 10 dB or better. Frequency stability is outstanding . . . less than 100 Hz drift per hour after 30 minute warmup . . . less than 100 Hz variation under a 10% line voltage variation. And the HW-100 is the only rig that uses a Field Effect Transistor (FET) in the VFO for superior thermal stablity.

A pleasure to use. Everything you need is up front. Dominating the front panel is the Main Tuning dial . . . a smoothly operating, vernier action control provides 28 revolutions of the knob per 500 kHz band segment, thanks to the use of the patented Harmonic Drive™ mechanism—a handy zero reset button is adjacent. Readout is on a large, circular, backlighted dial with 2 kHz divisions. To the left are the Band Selector switch, Mode selector, Load and Final tune, Driver preselector, Mic/CW Level control, Mic connector, and Phone jack. To the right is the S-Meter with a 3-position switch for checking ALC, Relative Power, and Final plate current. Adjacent is another 3-position switch for PTT, VOX and Calibrate. RF gain and AF gain controls complete the front panel. Located inside are controls for Meter Zero, Bias, VOX sensitivity, VOX delay, Anti-Trip, Carrier Null, and Neutralizing. On the rear apron are the CW key jack, 8 ohm speaker output, ALC input, Power/Accessory plug, RF output, and Antenna connector.

A pleasure to build. You build it all . . . even the VFO . . . yet it is easy. Most components mount on the nine circuit boards and one large wiring harness makes interconnections simple and fast. A handsome 2-piece green wrinkle finish cabinet is included. For the best value in SSB transceivers anywhere, put the HW-100 to work in your operation . . . it's a winner!

Kit HW-100, 22 lbs., no money dn., $22 mo. **$240.00**
Kit SB-600, 8 ohm speaker, 6 lbs. **$18.95**
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**

HW-100 SPECIFICATIONS—RECEIVER. Sensitivity: Less than .5 microvolt for 10 dB signal-plus-noise to noise ratio for SSB operation. **Selectivity:** 2.1 kHz minimum at 6 dB down 7 kHz maximum at 60 dB down (3.395 MHz filter). **Input:** Low impedance for unbalanced coaxial input. **Output impedance:** 8 Ω speaker, and high impedance headphone. **Power output:** 2 watts with less than 10% distortion. **Spurious response:** Image and IF rejection better than 50 db. **TRANSMITTER. DC Power input:** SSB: (A3j emission) 180 watt P.E.P. (normal voice: continuous duty cycle). CW: (A1 emission) 170 watts (50% duty cycle). **RF Power output:** 100 watts on 80 through 15 meters; 80 watts on 10 meters (50 Ω non-reactive load). **Output impedance:** 50 Ω to 75 Ω with less than 2:1 SWR. **Oscillator feed-through or mixer products:** 55 dB below rated output. **Harmonic radiation:** 45 dB below rated output. **Transmit-receive operation:** SSB: PTT or VOX. CW: Provided by operating VOX from a keyed tone, using grid-block keying. **CW Side-tone:** Internally switched to speaker or headphone, in CW mode. Approximately 1000 kHz tone. **Microphone input:** High impedance with a rating of —45 to —55 dB. **Carrier suppression:** 45 dB down from single-tone output. **Unwanted sideband suppression:** 45 dB down from single-tone output at 1000 Hz reference. **Third order distortion:** 30 dB down from two-tone output. **RF Compression (TALC*):** 10 dB or greater at .1 ma final grid current. **GENERAL. Frequency coverage:** 3.5 to 4.0; 7.0 to 7.3; 14.0 to 14.5; 21.0 to 21.5; 28.0 to 28.5; 28.5 to 29.0; 29.0 to 29.5; 29.5 to 30.0 (megahertz). **Frequency stability:** Less than 100 hertz per hour after 30 minutes warmup from normal ambient conditions. Less than 100 Hz for ±10% line voltage variations. **Modes of operation:** Selectable upper or lower sideband (suppressed carrier) and CW. **Dial calibration:** 5 kHz. **Calibration:** 100 kHz crystal. **Audio frequency response:** 350 to 2450 Hz. **Front panel controls:** Main tuning dial. Driver tuning and Preselector. Final tuning. Final loading. Mic and CW Level control. Mode switch. Band switch. Function swtich. Meter switch. RF Gain control. Audio Gain control. **Side controls:** Meter Zero control; Bias; VOX Sensitivity; VOX Delay; ANTI-TRIP; **Tube complement:** OA2 Regulator (150 V); 6AU6 RF amplifier; 6AU6 1st receiver mixer; 6AU6 Isolation amplifier; 6AU6 1st IF amplifier; 6AU6 2nd IF amplifier; 6BN8 Product detector and AVC; 6AU6 VFO Amp; 6CB6 2nd transmitter mixer; 6CL6 Driver; 6EA8 Speech Amplifier and cathode follower; 6EA8 1st transmitter mixer; 6EA8 2nd receiver mixer and relay amplifier; 6EA8 CW side-tone oscillator and amplifier; 6GW8 Audio amplifier and audio output; 12AT7 Heterodyne oscillator and cathode follower; 12AT7 VOX amplifier and calibrator oscillator; 12AU7 Sideband oscillator; 6146 Final amplifiers (2). **Diode complement:** 6 Germanium Diodes: Balanced modulator, RF sampling, and crystal calibrator harmonic generator; 9 Silicon Diodes: ALC rectifiers, anti-trip rectifiers, and DC blocking; 1 Zener Diode; cathode bias. **Transistors:** MPF105 FET—VFO; 2N3393—Voltage regulator. **Rear apron connections:** CW Key jack; 8 Ω output; ALC input; Power and accessory plug; RF output; Antenna; Spare. **Power requirements:** 700 to 850 volts at 250 ma with 1% maximum ripple; 300 volts at 150 ma with .05% maximum ripple; —115 volts at 10 ma with .5% maximum ripple; 12 volts AC/DC at 4.76 amps. **Cabinet dimensions:** 14-13/16" W x 6-5/16" H x 13⅜" D.

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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.



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