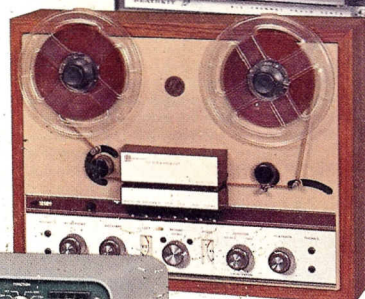
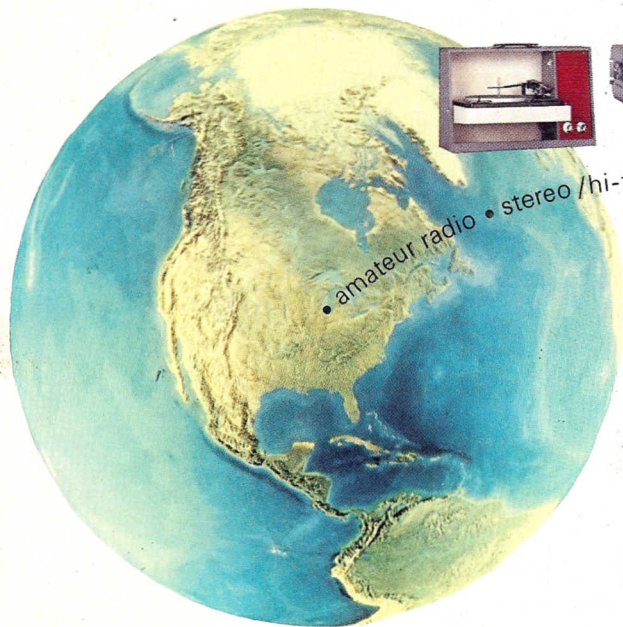


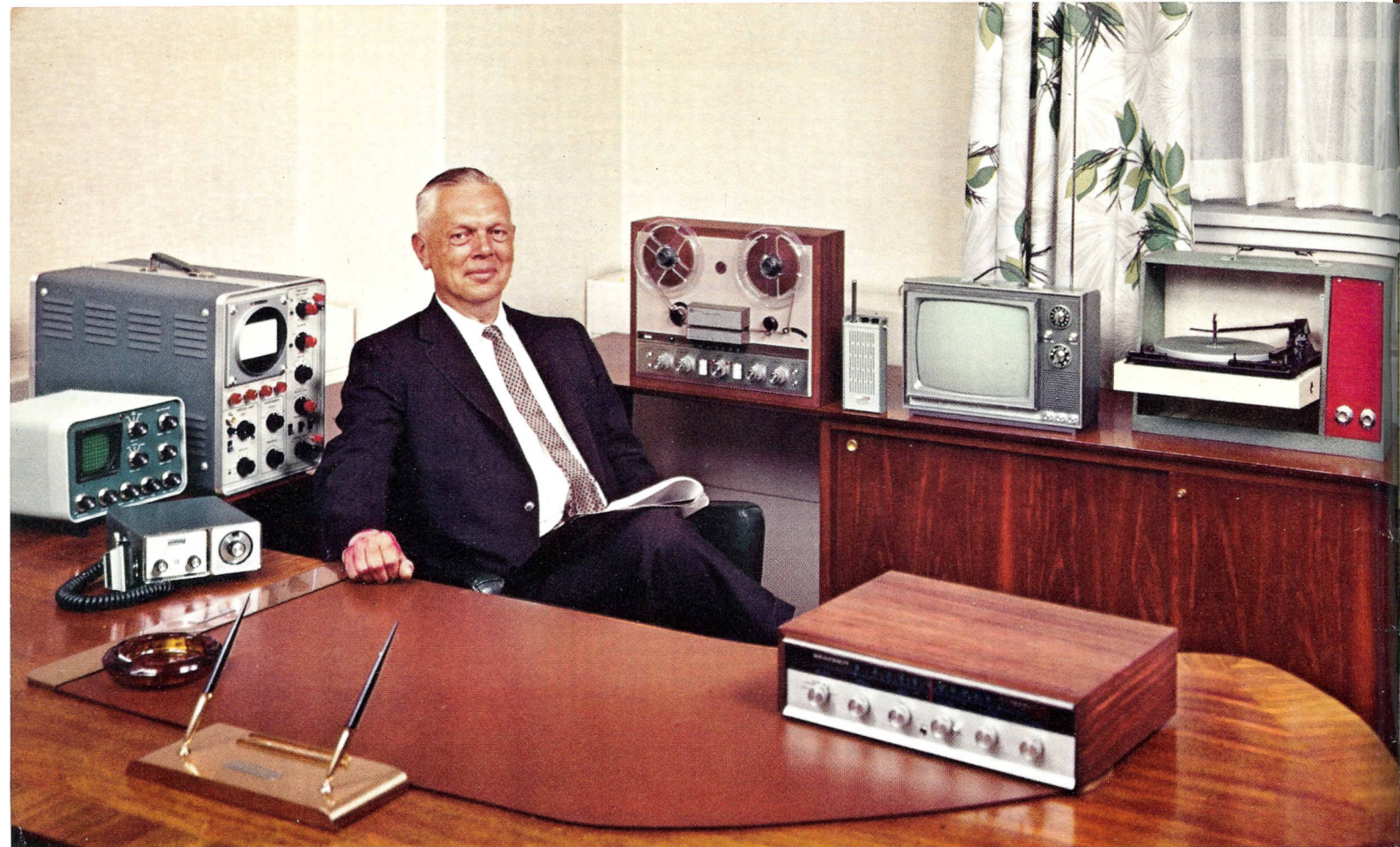
HEATHKIT® 1967

CATALOG - 810/67A



• amateur radio • stereo /hi-fi • citizen's band • marine • photographic • educational • shortwave • test instruments • stereo /hi-fi • amateur radio • color tv • electronic musical instruments

over 250
electronic kits—
world's largest selection



WELCOME TO THE WORLD OF HEATHKIT 1967

There are several new "firsts" in this new Heathkit catalog which we believe you will find interesting kits to build and excellent equipment to own.

Some examples are:

- A portable transistor TV set which is battery or AC powered. In addition, another "first" in the kit industry is included in this set--an integrated circuit--for increased reliability and easy assembly. Turn to pages 10-11.
- Guitars and amplifiers, both in kit form--products you have requested repeatedly. The guitar requires no woodworking and is easy to build. The savings are unusual--even for a kit product. See the center insert.
- A transistor portable phonograph for your youngsters...one they can build for themselves in just one evening. And the sound is much superior to that usually heard on such a low cost unit. It is shown on page 100.
- SSB amateur radio equipment which now include WWV reception and front panel transceive switching for separate receivers and transmitters. See pages 82-83.
- A factory assembled 2-watt walkie talkie which is capable of solid copy up to six miles. See page 105 for details.
- Increased numbers of factory-assembled products in the educational field as well as test instruments.

And, of course, this new catalog contains the complete line of Heathkit stereo/hi-fi, marine, amateur radio, test equipment, color TV, electronic organs, shortwave, Citizen's Band, and photographic units.

If you would like more technical information on any product, send for a schematic-specification sheet on the model. There is no charge. And if you have any new product suggestions, be sure to drop us a line.

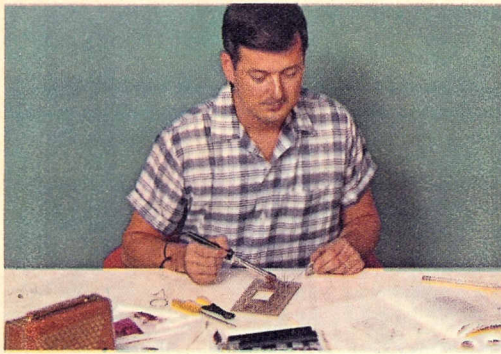
Sincerely,

D. W. Nurse

D. W. Nurse
President

P.S. Would a friend of yours like a copy of this new Heathkit catalog? Just jot their names and addresses on the back of the order envelope.

Why Do Millions Build Heathkit® Electronics?



Creative Fun And Unique Satisfaction

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

Up to 50% Savings Over Factory-Built Versions

Besides the fun, building your own Heathkit is economical. It's like getting paid for the hours you spend enjoying your hobby. For example, when you build the GD-983 Transistor Organ, pg. 12 you "earn" as much as \$7 an hour when you consider the big savings. And since there are no dealers or distributors, the usual middleman profits are passed on to you as extra savings.

A Finished Product With Superlative Performance

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

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

Direct Factory-To-You Delivery

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

Liberal Credit Terms

Build your Heathkit now . . . pay later with the convenient Heath Time-Payment Plan. No money down and up to 12 months to pay on orders from \$25 to \$300 . . . 10% down and up to 18 months on orders from \$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. **ATTN: MILITARY PERSONNEL IN EUROPE.** Duty-free Heathkit equipment is available at U. S. catalog prices (plus nominal surcharge for freight and handling) from Heathkit Gerate GmbH, 6079 Spremlingen bei, Frankfurt/Main, Germany.

Retail Heathkit Electronic Centers

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

Chicago, Illinois
3462-66 W. Devon Ave.
Phone: 583-3920

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

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

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

Redondo Beach, Calif.
(Marine Specialists)
202 Harbor Drive
Phone: 376-0908

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

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

Detroit, Michigan
18645 West 8 Mile Rd.
Phone: 535-6480

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.
(two locations)
5036 Venice Blvd.
Los Angeles, California
Phone: 933-8141
&
2010 W. Lincoln Ave.
Anaheim, California
Phone: 535-2151

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

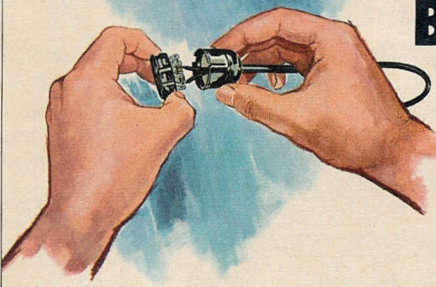
Park Armature Company
1218-30 Columbus Ave.
Boston, Mass.
Phone: 427-1950
Electronic Servicer
of N.Y.
65-37 Queens Blvd.
Woodside, New York
Phone: 457-7733
Scientific Radio-TV/Hi-Fi
4122 E. Madison St.
Seattle, Washington
Phone: 322-3215

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

READ WHY YOU CAN BUILD ANY HEATHKIT!

The Key To Your Success . . . Heathkit® Manuals!

READ THIS BOOKLET FIRST



KIT BUILDERS GUIDE

You will find important information on tools and soldering, plus many guides to good kit assembly:

- How to unpack your kit and check the parts.
- How to follow the directions in the kit assembly manual.
- What to do if you have any problem with the completed kit.

Take a few minutes now to read through this booklet before you start to work on your kit. After you finish your kit, be sure to keep the Assembly Manual and this booklet for reference.

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Page 7

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 you how to mount parts, cut leads and position them . . . completely illustrated in full color describing 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 the instructions.

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.


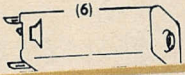
8 Heath Warranty

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

PARTS LIST

NOTE: The numbers in parentheses in the Parts Lists are keyed to the numbers in parentheses on the pictures of the parts to aid in parts identification.

PART No.	PARTS Per Kit	DESCRIPTION
(5)40-77	1	Coils-Antenna-Transformers BFO coil

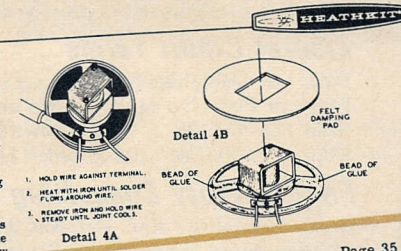



Page 18

STEP-BY-STEP ASSEMBLY

Prepare the speaker wires and connect them to the speaker as follows.

- () Cut two 3" lengths of hookup wire. Strip 1/8" to 3/16" insulation from both ends of each wire. Melt a small amount of solder on the bare ends of each wire.
- () Connect these wires to the speaker terminals by following the directions in Detail 4A.
- () Glue the felt damping pad to the rear of the speaker as shown in Detail 4B. Apply a bead of any all-purpose glue around the metal frame on the back of the speaker.



Page 35

TROUBLESHOOTING CHART

CONDITION	POSSIBLE CAUSE
Unit completely inoperative.	<ol style="list-style-type: none"> 1. Battery not charged. 2. Off-On switch inoperative.
Receiver dead, transmitter ok.	<ol style="list-style-type: none"> 1. Squelch control misadjusted. 2. Improper adjustment of coil L2. 3. Earphone jack open. 4. Open circuit in diode D2.

WARRANTY

The Heath Company warrants that the parts supplied in its kits (except batteries) shall be free of defects in materials and workmanship under normal conditions of use and service. The obligation of Heath under this warranty is limited to replacing or repairing any such part upon verification that it is defective in this manner. This obligation is further limited to such defective parts for which Heath is notified of the defect within a period of ninety (90) days from the original date of shipment of the kit.

The obligation of Heath under this warranty does not include either the furnishing or the expense of any labor in connection with the installation of such repaired or replacement parts. The obligation of Heath with respect to transportation expenses is limited to the cost of shipping the repaired or replacement parts to the buyer, provided such repair or replacement comes within the terms of this warranty.

The foregoing warranty extends only to the original buyer and is expressly in lieu of all other warranties, expressed or implied. The foregoing warranty is further in lieu of all other obligations or liabilities on the part of Heath and in no event shall the Heath Company be liable for any anticipated profits, consequential damages, loss of time or other losses incurred by the buyer in connection with the purchase, assembly or use of the kit product or components thereof.

The foregoing warranty shall be deemed completely void if acid core solder or paste flux or other corrosive solders or fluxes have been used in assembling or repairing the kit product. Heath will not replace or repair any parts of any kit products in which such corrosive solders or fluxes have been used.

This warranty applies only to Heath products sold and shipped to points within the continental United States and to APO and FPO shipments. Warranty replacement for Heath products sold or shipped outside the United States is on an f.o.b. factory basis. Contact the Heath authorized distributor in your country or write: Heath Company, International Division, Benton Harbor, Michigan, U.S.A.

HEATH COMPANY

Read What Heathkit® Owners Say

Quality!

MR. RUSSELL E. HEMBROOK, INGLE-SIDE, ILL.: "Just an unsolicited testimonial as to what I think is a very outstanding job that your company has done putting this Thomas transistor organ in kit form. The step-by-step directions furnished were very clear and precise. I certainly recommend this organ in kit for anyone with a little patience and love for music all wrapped up in a beautiful piece of furniture for their home."

MR. DONALD R. FARMEN, WILLIAMSON, N. Y.: "It is my personal opinion that Heathkits fill a real need in that they make it possible for many to own electronic equipment of high quality at relatively low cost."

MR. ALFRED J. MANCINELLI, BRONX, N. Y.: "The quality of the amplifier (Heathkit AA-100) greatly exceeded my wildest dreams. It is truly unbelievable. I never expected that such realism could be obtained."

MR. BILL PINKENSON, K3WPH, PHILA., PENN.: "For the first time in my amateur career I was able to tune sideband with the ease of AM. The quality and audio response is terrific. I sure can see the amount of thought and engineering that went into this quality receiver (Heathkit SB-300)."

Savings!

MR. AL TSCHIRHART, WA5EGG, HOUSTON, TEXAS: "I made side by side comparisons with a receiver which was commercially built, and I have one conclusion. Why pay over twice as much for a receiver which is no better than the (Heathkit) SB-300."

MR. J. I. NEWTON, CHAPEL HILL, N. C.: "My friends tell me the color is better than they have seen on sets costing \$895, and I must say that I agree."

MR. B. E. LANNING, LONG BEACH, CALIF.: "Reception on our Heathkit color set is superior to any other color set I have seen regardless of price."

RADIO-TV EXPERIMENTER MAGAZINE: "The repair cost savings during the Heath Color TV set's life compared to commercial units may be more than \$200."

EDITOR JULIAN D. HIRSCH, HI-FI/STEREO REVIEW MAGAZINE: "One of the best things about the Heath AA-22 is its price, \$99.95, in kit form, complete with cabinet."

RADIO-TV EXPERIMENTER MAGAZINE: "Comparing the AR-13A on a feature versus dollar basis, one cannot help but admit that the receiver is a rock-bottom dollar buy, about the best you can hope for in the solid-state market place."

Service!

MR. DONALD N. EBERT, MAYWOOD, ILL.: "... I was treated in the most courteous manner, and made to feel that satisfying me was of utmost importance. The extra effort the Heath Company uses to make the customer feel that he is more than just a completed order blank or a buck in the cash register, has made quite an impression on me."

MR. MURRAY E. SCHMIDT, FT. LAUDERDALE, FLA.: "I would like to tell you in five hundred words or less just how much I enjoy doing business with Heath. To begin, I have always received the very finest service from your mail order department, usually receiving my order within a week."

MR. MICHAEL C. LENDEMER, WEST CALDWELL, N. J.: "Your company is different in that it takes a genuine interest in its customers' views. I heartily compliment you on this. In the past your staff has given me much technical assistance."

MR. T. H. MacKEIGAN, TROY, MICHIGAN: "I have had this (FM Tuner) in use for several weeks and must compliment you on a very fine job. Your service and attitude in this case is commendable and I am more than satisfied. This policy must make you many friends."

Thousands Of Beginners Prove You Can Build A Heathkit®!

MR. ARTHUR DILKS, KANSAS CITY, MO.: "Before I ordered this kit (FM Tuner) from you, my ignorance of anything electronic was monumental. It still is, but my satisfaction with and faith in your products and step-by-step assembly instructions is absolute. I'm not just pleased, I am tickled pink!"

MRS. GEORGE C. DANIELS, JACKSON, MICH.: "This was my first experience with assembling one of your kits and while I was somewhat dubious about my ability to do so at my age (74) I found it surprisingly simple and very fascinating to follow the step-by-step instructions in your assembly manual. When I finished the assembly the results surprised me for I could tune in on broadcasts from many parts of the world."

JOHN SPIRES, WEAVER, ALABAMA: "I am eleven years old and had no help in as-

sembling the kit (GR-81 Shortwave Radio). It was very easy to assemble yet I have never had any experience in soldering or intricate and exacting work. Your kits are indeed the finest in parts and ease of assembly."

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."

MR. DREW ARLEN COPELAND, WAYNESBORO, VA.: "This was my first experience in kit building and the ease with which this kit (GC-1A Shortwave Radio) went together amazed me. I think the reason for the ease of assembly is because of the excellent manual that was included with the kit. This instruction booklet was clear and concise about the construction of the kit and contained many helpful diagrams to aid the builder. An-

other thing I found was the consistent quality in the parts and workmanship of the pre-assembled equipment which came with the kit."

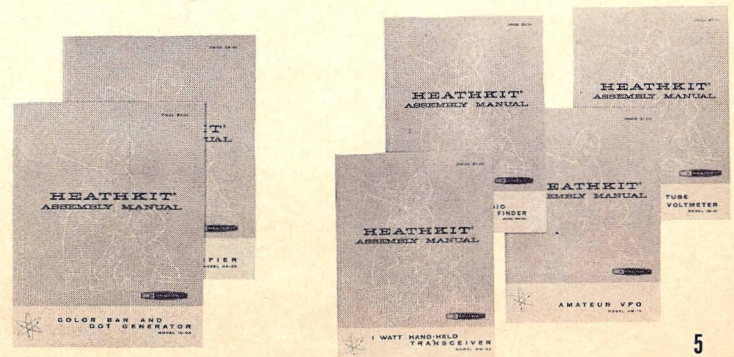
MR. R. D. FROMAN, NEW ROCHELLE, N. Y.: "I managed to assemble it (Heathkit AR-13A Stereo Receiver) with the very complete instructions of the step-by-step manual which was amazing in itself, for I have never done any work of this type before. The thing that amazed me most was that when I plugged the line cord in it really worked."

DR. ALEX VON SCHLICHTON, PHILADELPHIA, PENN.: "Several months ago I purchased your AJ-33 tuner and AA-22 amplifier. Never having built a kit before, it was with some trepidation that I undertook the task. I honestly expected fire and sparks to fly, when plugging the units in for the first time. Not only did that not happen, but both units functioned perfectly."

Convince Yourself How Easy It Is . . . Order A Manual

Most manuals cost just 50c ppd. Because of their large size, manuals for the deluxe amateur radio SB series (SB-100, SB-110, SB-200, SB-301, SB-401), AR-13A and AR-14 stereo receivers, both transistor organs, all TV kits and the IO-14 oscilloscope cost \$2.00 ppd. Manuals for EK educational and EF applications series are \$5 ppd. each. Simply list the model number and write "Manual Only" on the catalog order blank.

Important: As new kits are introduced, some manuals may cost \$2 because of their size—please write for a quotation before ordering.





HOME
ENTERTAINMENT

Discover The Fun Of Kit Building . . .

Start With A Recommended "Beginner's Kit"



NEVER TRIED BUILDING A KIT BEFORE? Then you've probably asked yourself "Can I really build one?" This same question has also crossed the minds of millions of others. People from virtually every background imaginable, and from all age groups. People whose knowledge of electronics went no farther than knowing it has something to do with electricity. People whose skill with tools ended with using a screwdriver. And yet, these same people are now confirmed Heathkit builders. (Read some of their comments on Page 5.)

The reason for their success? First, the thorough Heath step-by-step instructions that are written in non-technical language . . . so simple anyone can easily understand. And the "exploded" diagrams that show you exactly where each part goes and how to install it. Even shows you how to solder. Nothing is left to chance. Special tools? All you need are a screwdriver, long-nosed pliers, soldering iron (there are some good ones on pg. 97) and some spare time. And the feeling when you finish your kit is like breaking par on a golf course . . . you did it!

To prove our point, we recommend you start with one of these 4 kits. 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. Check over the features, and select the one that appeals to you most. Then give it a try!

A All-Transistor AM Portable . . . Includes FREE Tool Kit and Batteries . . . Everything You Need To Build It

- 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

CURIOUS ABOUT KIT-BUILDING? Then here's an ideal way to discover how fun and how easy it is. Once you start, you'll discover why this fascinating hobby has captured the imagination of millions of people. People from all walks of life. And of all ages.

And when you've finished, you have a handsome all-transistor portable that you can take to the beach, on picnics, to ballparks, camping . . . anywhere! Provides countless hours of good listening, and years of dependable trouble-free service.

INCLUDES EVERYTHING YOU NEED to make it as easy and fun to build as it is to use. All parts mount on a clearly marked circuit board. Makes wiring fast and simple . . . you'll finish the entire kit in just 4 to 6 hours. The non-technical step-by-step 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.

COMPARE IT TO PORTABLES COSTING MUCH MORE! Features a 4" x 6" permanent magnet speaker for a crisp, clean sound . . . the kind you can't get from miniatures. A 6 transistor, 3 diode circuit provides extra power and range . . . a built-in ferrite rod antenna picks up distant stations with ease . . . and a smart, simulated tan leather case that will stand rugged wear.

Also makes an ideal gift for any occasion . . . if you can resist keeping it for yourself.

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

B Low-Cost All-Transistor FM Stereo Tuner

- 14-transistor, 4-diode circuitry for clean "transistor sound" and cool, instant operation • Stereo phase control for maximum separation, minimum distortion • 4-stage IF section for a high degree of sensitivity & selectivity • Automatic stereo indicator light • Available with or without cabinets

Minimum assembly time is assured through the use of a pre-built, prealigned front-end tuning unit, and simple-to-wire circuit board . . . leaves only a minimum of easy point-to-point wiring. Total assembly time runs around 4 to 6 hours. If you already have a stereo amplifier, this is a good point to begin your kit-building career. If you don't

own an amplifier, there's one that matches the AJ-14 and takes only 10 hours to build. This way, you can build your own stereo system! See pg. 24 for details.

Kit AJ-14, 6 lbs. . . (less cabinet for custom mounting)
no money dn., \$5 mo. \$49.95

C Ideal For Boy Scouts, Campers . . . 4-Transistor Walkie-Talkie

- Operates ¼ mile or more between similar units • Built-in battery power • No license, forms, tests or age limit • Crystal-controlled transmitter-superregenerative receiver • Compact . . . fits easily in pocket, purse • Sturdy steel case

You'll be finished with this compact, 2-way transceiver in just one evening. Only one simple circuit board to wire before installing in the sturdy rustproof aluminum case. Includes crystals (specify channel no.) and an alignment tool for quick, easy peaking of the receiver section. Easy to use, too . . . just flip it on, push a button to talk, release to listen. Operates ¼ mile or more. These are fun at any outing, but useful in dozens of practical ways, too . . . camping, fishing, construction gangs, etc. See pg. 104 for full details.

Kit GW-31A, 2 lbs. \$19.95
Kit GW-31-2 (pair), 4 lbs. . . no money dn., \$5 mo. \$35.00
GWA-30, Battery set (2) . . . 1 lb. \$2.95

D New Transistor Portable Phonograph . . . Plays 4 Speeds . . . Assembles In 2 Hours . . . Costs Just \$39.95

- Automatic monophonic play of 16, 33½, 45 & 78 rpm records
- All solid-state circuitry insures cool, instant operation • Dual Sapphire stylus for LP's or 78's • Compact and light weight with easy-carry handle for suitcase portability • Operates on any 117 v. AC household source • Includes 4" x 6" speaker, 45 rpm adaptor spindle, preassembled polyethylene covered pressed wood cabinet

Just one small circuit board to wire, then mount the speaker, and plug in two connectors from the circuit board to the preassembled changer . . . you'll finish in 1 to 2 hours. Plays all 4 speeds . . . anything from the Beatles to Beethoven. Changer folds up to make a compact case that's easy to carry from room to room, or house to house. Handles stacks of 6 records of the same size. Sturdy pressed wood cabinet with attractive olive & ivory polyethylene cover to withstand rugged wear. All you add are records . . . no extras to buy. See page 100 for details.

Kit GD-16, 20 lbs. . . no money dn., \$5 mo. \$39.95



A 6-Transistor AM Portable . . . Includes FREE Tool Kit & Batteries



B All-Transistor FM Stereo Tuner . . .
Assemble in 4 To 6 Hours

*"Beginner's
Kits"*



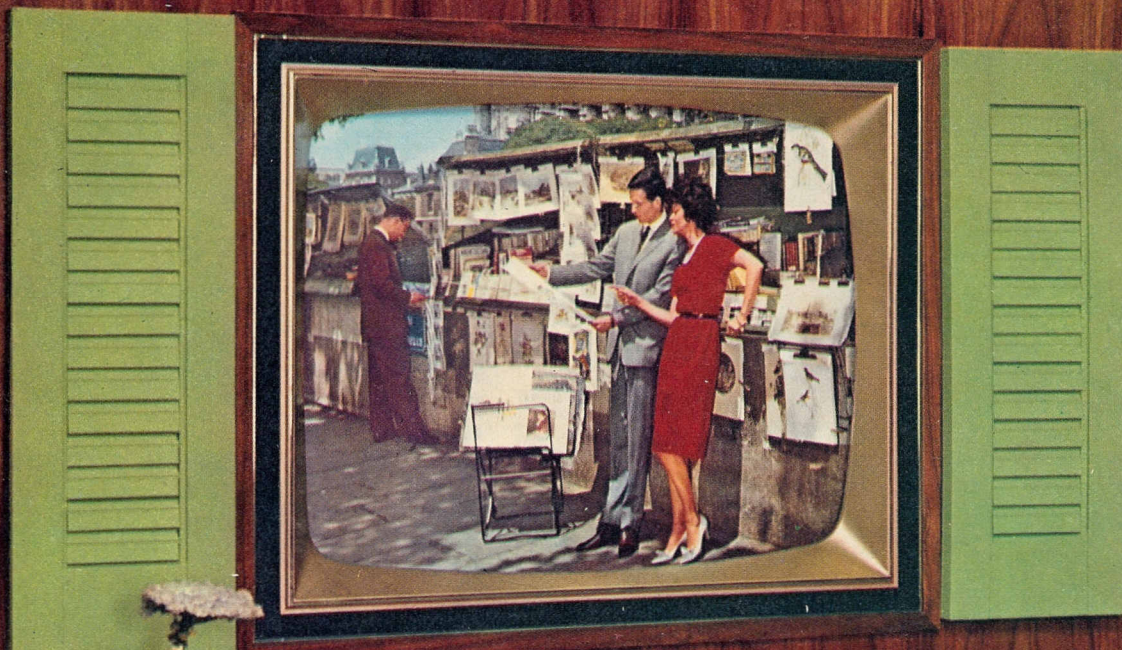
C 4-Transistor Walkie-Talkie . . .
Finish In An Evening



D New! Transistor Portable Phonograph . . .
Build It In 2 Hours

Deluxe Heathkit® "295"

Rectangular Color TV... \$469.95!



Read What The Experts Say About This Unique Set!

HUBERT LUCKETT, EXECUTIVE EDITOR OF POPULAR SCIENCE, MAY '66 ISSUE: "Building your own color TV from a kit is not as outrageously impractical as you might suppose. 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 in 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 of the GR-25 (now the GR-295) 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."

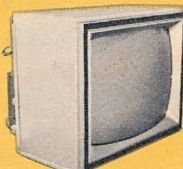
JOHN DRUMMOND, TECHNICAL EDITOR, POPULAR ELECTRONICS, MAY '66 ISSUE: "... we simply had to know how well a 25 hours-to-build \$469.95 color TV kit would stack up against the more expensive, well-advertised wired sets people are gobbling up. It didn't take us long to find out that the Heath GR-25 (now GR-295) compares favorably with the best of them."

Some Heathkit Color TV Owner's Comments!

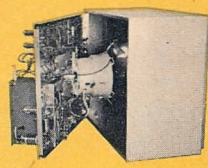
MR. ROBERT D. TAYLOR, SACRAMENTO, CALIF.: "... it's the best TV on the market, nothing compares with it (I have been looking at & checking TV's over 2 years). The manual (service) is a 'gold mine' of savings."

MR. C. A. PETRARCA, WEST CALDWELL, N. J.: "We are still getting oohs, ahhs, 'best I've ever seen', 'how bright the colors are', etc. from our friends and neighbors."

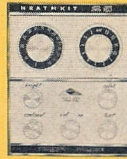
MR. J. K. PETERSON, SPOKANE, WASH.: "There were no problems whatsoever in construction, assembly, test and check-out, or installation."



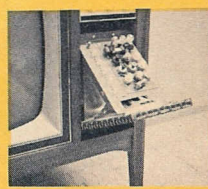
Exclusive Heath Magna-Shield!
... keeps out external magnetic fields and improves color purity by covering entire tube.



Vertical Swing-Out Chassis!
Makes chassis more accessible for service and installation.



Universal Main Control Panel!
Contains all main controls for more flexible installation . . . top, bottom or right side.



Convergence Control Panel!
Front-panel mounted under "tilt-out" grille cloth section for easier, faster picture convergence.

Space-Saving Rectangular Tube . . . Choice Of 3-Way Installation . . . Exclusive Built-In Servicing . . . And You Can Adjust It Anytime For Peak Performance!

• Hi-fi 90° 295 sq. inch rectangular color tube with anti-glare safety glass and "rare earth" phosphor for brighter pictures, livelier colors • 27-tube, 10-diode circuit • 25,000 volt regulated picture power • Automatic degaussing & mobile degaussing coils • Exclusive Heath "Magna-shield" covers entire tube for improved color purity • Built-in servicing facilities to adjust & maintain set • Extra B+ boost for improved picture definition • Dynamic pincushioning correction circuit eliminates picture edge distortion • Deluxe VHF turret tuner with "memory fine tuning" & long-life nickel silver contacts • 2-speed, transistor UHF tuner • Automatic color control circuit to reduce color fading • New 3-stage IF strip to reduce interference & improve reception • Gated automatic gain control for steady, flutter-free pictures • Circuit breaker protection • New vertical swing-out chassis for easier servicing & installation • 3-way installation . . . wall, custom cabinet or Heath factory-assembled cabinet • Assembles in just 25 hours with all critical circuits prewired & tested • 1-year warranty on picture tube, 90 days on all other parts

NO CUT-OFF CORNERS, NO PICTURE LOSS. With the Heath GR-295 (formerly the GR-25) you see the complete picture with a full 295 sq. inches of viewing area . . . yet its rectangular shape takes less space in a cabinet or wall installation. A special "rare earth" phosphor insures brighter, more brilliant pictures . . . a 25,000 volt regulated power supply assures a sharp, clear picture at all times . . . and the anti-glare safety glass protects its handsome face.

NO COSTLY SERVICE CALLS FOR PICTURE ADJUSTMENTS OR SIMPLE REPAIRS. Exclusive built-in servicing facilities—a feature that can't be bought on any other set at any price—includes a dot generator so you can converge the set and maintain the best picture at all times. Full color illustrations and simple instructions in the Heathkit manual show you what to look for and how to achieve it. You become the expert. Results? The best color picture ever.

PICTURE TUBE IS DEMAGNETIZED AND "CLEANED" everytime you turn the set on from a cold start . . . thanks to the Automatic Degaussing circuit. Eliminates any manual degaussing. Degaussing coil is included for initial set-up.

STEADY, JITTER-FREE PICTURES EVEN IN HIGH INTERFERENCE AREAS . . . Gated Automatic Gain Control provides a balanced picture, even under changing signal conditions such as airplanes flying over your reception area. A color-killer circuit cuts off color signals when a black and white signal is received.

STRAIGHT PICTURE EDGES WITH NO DISTORTION . . . no more "waves" or contorted corners. Two pincushion transformers with associated correction circuits assure straight vertical and horizontal lines.

HIGH RESOLUTION, IMPROVED DEFINITION AND BRIGHTER PICTURES . . . thanks to the extra B+ boost which accelerates electron beams for a smaller spot size.

COLOR FADING IS REDUCED . . . thanks to Automatic Color Control. You always have the best picture.

TILT OUT, FRONT-PANEL CONVERGENCE CONTROLS . . . cabinet speaker grille tilts out to make dynamic convergence easier (see illust. opposite page). No reaching around the set or mirrors to set up.

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

DELUXE VHF TURRET TUNER . . . with "memory" fine tuning . . . no need to readjust picture when you return to a channel. Long-life silver contacts assure positive switch action. Both channel indicators are lighted for easy reading.

3-STAGE VIDEO IF STRIP . . . reduces interference, improves definition.

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

HI-FI SOUND OUTPUTS . . . accommodate special contained-field 6" x 9" speaker (included). Also has cathode follower output to play set through your hi-fi.

YOU CAN INSTALL ANY ONE OF 3 WAYS . . . mount in a wall or your own custom cabinet . . . required dimensions: 20" D x 21" H x 26" W. Or install in any of the two handsome factory assembled and finished Heath cabinets.

At the time this catalog is being prepared (Aug. '66), we cannot make immediate delivery of 25" color tv kits because of shortages. We expect this situation to ease in the near future.

Kit GR-295, all parts including chassis, tubes, mask, UHF & VHF tuners, mounting kit and special extended-range 6" x 9" speaker, 131 lbs. (REA or motor freight only) . . . \$47 dn., as low as \$29 mo. \$469.95

GR-295 SPECIFICATIONS—Picture size: rectangular, approx. 295 sq. inches, 23" diagonally, 20" horizontal, 15 1/2" vertical. **Deflection:** Magnetic 90°. **Focus:** Electrostatic. **Convergence:** Magnetic. **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, 50-15,000 Hz. Harmonic distortion, less than 3%. **Power requirements:** 110-130 v., 60 Hertz AC, 330 watts. **Wall mounting:** 20" D x 21" H x 26" W inside. Control panel, assembly, 6 1/2" W x 7 7/8" H x 7" D.

Contemporary or Early American TV Cabinets!



Contemporary Styled Walnut Cabinet . . . \$59.95
Factory assembled of fine walnut veneers and solids with oil-rubbed walnut finish. GR-295 speaker and convergence panel mount behind tilt-out grille cloth on right side. Measures a slim 19" D x 31" H x 34 1/2" W.
Assembled GRA-295-1, 35 lbs. . . . Express or motor freight, no money dn., \$6 mo. \$59.95



**Expected Shipping Date
Late September**
Deluxe Early American TV Cabinet . . . \$99.95
Made of a special combination of maple veneers and solids . . . all beautifully finished in popular salem-maple. GR-295 speaker and convergence panel mount behind grille cloth on right side. Measures 19 1/4" D x 31" H x 36" W.
Assembled GRA-295-3, 48 lbs. . . . Express or motor freight, no money dn., \$10 mo. \$99.95

NEW STANDARDS FOR TV PICTURE SIZES

Effective January 1, 1967, a new FTC ruling requires TV manufacturers to specify tube size in terms of viewable area. Also under this new ruling manufacturers can no longer relate model numbers to nominal picture tube size. As a result, our former model GR-25 color TV kit now becomes model GR-295. The total viewing area is exactly the same, 295-square inches. (For comparison—actual picture size is: Horizontal—20", Vertical—15 1/2", Diagonal—23".)



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.



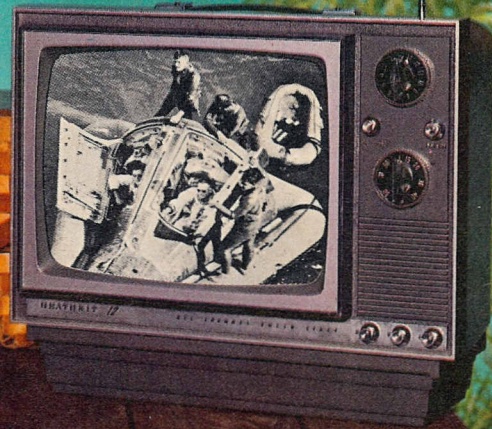
Take It To The Beach . . . or use it poolside so you won't miss the ball game.



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



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



GR-104
\$119⁹⁵

(less battery pack)

Expected Shipping
Date Late October



Black & White TV... Transistor Portable

- UHF & VHF in one unit for all-channel (2-83) reception • 16 tube, 5 diode circuit gives 30 tube performance • High definition 282 sq. inch 90° tube with anti-glare bonded safety glass • Spark-gap socket for picture tube protection • Deluxe Nu-vistor VHF tuner • Transistor UHF tuner • 20,000 volt picture power • Transformer power supply • Line Circuit Breaker, filament and B+ protection • Line thermistor for long tube life • Gated Automatic Gain Control and Noise Canceller for peak reception • Wide-band circuitry with 5 interference traps • DC restorer • Hi-Fi cathode follower output for hi-fi system • Hi-Fi sound-power output for speaker • Finest parts—tubes alone list over \$135 • Easy circuit board construction, wiring harness, and pre-built tuner, IF strip, and hi-voltage sections—finish in 12 hours



GR-22A
CHASSIS & TUBES
\$169⁰⁰

(less cabinet & speaker)

New! World's First Transistor Portable Black & White TV Kit . . . Plays Anywhere . . . Space-Age Integrated Sound Circuit . . . Assembles In 10 Hours!

• 74 sq. inch (12" diagonal) 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. automotive type battery or accessory rechargeable battery pack • Instant "On" AC operation • Covers all channels, 2 thru 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 • Preassembled and aligned tuners assure peak performance, speed construction . . . takes only 10 hours • Front panel-mounted speaker • 1-year warranty on picture tube, 90 days on all other parts

PLAYS ANYWHERE! With its compact size and light weight, the new Heathkit GR-104 personal portable is ready to go anywhere to give you a full 74 sq. inches (12" diagonal) of beautifully clear black and white TV pictures . . . on all 82 channels. An optional rechargeable battery pack is available so you can easily play it while you are fishing, camping, picnicking, at the beach . . . anywhere you go. If you're a boat owner, you can run it from your boat's 12 v. battery. And it plugs into any household 117 v. AC outlet . . . easily totes to the kitchen, bedroom, play room, workshop, patio, basement . . . any room of the house.

SPACE-AGE CIRCUITRY ASSURES DEPENDABLE PERFORMANCE AND DURABILITY. First time in a kit . . . an integrated sound circuit the size of a single small transistor that actually contains 39 TV parts . . . 12 transistors, 12 diodes, 15 resistors . . . reduces heat, consumes less power, makes assembly even easier. The picture tube is the shell bond type (no additional safety glass to clean) with a short 20 mm neck (requires less current to deflect the picture). There's gated automatic gain control for steady flutter-free pictures at all times . . . a front-panel mounted 3" speaker for better sound . . . three video IF amplifiers

for maximum gain with controlled bandwidth . . . deluxe VHF "memory" tuner that "remembers" so you don't have to fine tune each time you return to a channel . . . two-speed UHF tuner for fast channel selection or fine tuning individual stations . . . safe transformer regulated power supply (no drift from supply variations) . . . lighted channel indicators . . . two thermal circuit breakers (no fuses to replace) . . . and complete front-panel controls—horizontal and vertical hold, brightness, contrast, OFF-ON volume and channel selector.

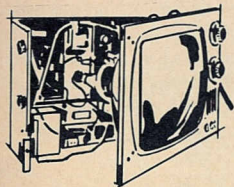
FROM PARTS TO PORTABLE PROGRAMS IN JUST 10 HOURS. Both tuners and the coils are prebuilt and aligned at the factory. You just wire two circuit boards, connect a wiring harness, mount the parts and you're ready for deluxe portable TV. The hinged, swing-out chassis helps speed assembly, and makes servicing a breeze.

Includes a built-in telescopic whip for VHF, plus an 8" UHF loop that attaches in seconds to the back panel. Also has inputs for 300 ohm balanced and 75 ohm unbalanced fixed antennas. The high impact blue-gray plastic cabinet with pearl mask adds to its modern, slim appearance, withstands rugged handling. Choose the GR-104 now.

Kit GR-104, portable TV for 117 v. AC and 12 v. DC operation, 22 lbs. . . no money dn., \$11 mo., Expected Shipping Late Oct. **\$119.95**

Kit GRA-104-1, rechargeable battery pack, 9 lbs. Expected Shipping Date Late November . . . No money down, \$5 mo. **\$39.95**

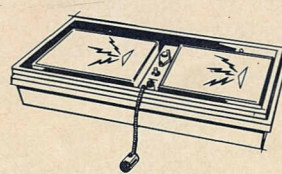
GR-104 SPECIFICATIONS: Picture Size: 74 sq. in. viewing area, 12" diagonal. Deflection: Magnetic, 110 degrees, 20 mm neck. Focus: Electrostatic. Antenna Input Impedance: 300 ohm balanced, 75 ohm unbalanced. Tuning Range: VHF TV Channels 2 thru 13, UHF TV channels 14 thru 83. Picture IF Carrier: 45.75 MHz. Sound Carrier: 41.25 MHz. Sound IF Carrier: 4.5 MHz. Video Response: To 3.5 MHz. Audio Power Output: 500 milliwatts into 24 ohm load. Controls (front panel): UHF coarse tuning, UHF fine tuning, VHF channel selector, VHF fine tuning, OFF/ON volume, brightness, contrast, vertical hold, horizontal hold. Controls (rear panel): Vertical linearity, Vertical height, Low voltage adjust, AGC. Transistor & Diode Complement: 36 transistors, 25 diodes, 1 picture tube. Power Requirement: 110-130 volts AC @ 0.35 amperes, 40 watts; 12 volts DC @ 1.7 amperes, 20 watts. Overall Size: 11 1/2" High, 15 3/4" Wide, 9-5/16" Deep. 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.



Optional Rechargeable Battery Pack Base Mount (shown opposite) A combination of rechargeable batteries and charging circuit that plugs into the rear panel for "play-anywhere" operation of the GR-104. Batteries will automatically recharge when plugged into any 120 v. AC outlet, and the GR-104 is turned off. **Kit GRA-104-1**, 9 lbs. **\$39.95**

And Deluxe Home Console

Hi-Fi, Pictures . . . FM Hi-Fi Sound . . . Deluxe 282 Sq. In. Black & White TV . . . Install In-Wall Or Cabinet

REPLACING THAT OLD TV SET? Then consider this Heathkit GR-22A All-Channel Black & White TV receiver. The same GR-22A that caused HIGH FIDELITY magazine to comment: "the picture is very clear, almost like a glossy photograph." The same set that prompted Major Charles Leonetti of Tampa, Florida to write: ". . . we have browsed in many quarters only to find that the GR-22A far surpasses all commercial TV's, even the well-known name brands on the market."

GOES FROM PARTS TO PICTURE IN JUST 12 HOURS. And no special skills or knowledge are required. All critical circuits (tuner, I.F. strip and high voltage sections) are factory built and aligned, ready to install. You simply mount the sub-assemblies and controls, wire a non-critical circuit board, connect 2 pre-cut cabled wiring harnesses, and make a few simple adjustments. All controls are front-panel mounted for easy-to-reach adjustments.

CUSTOM, WALL OR CABINET INSTALLATION. Choose the chassis and tubes, and the handsome custom wall mask (GRA-22-5 opposite) for installation in either a custom cabinet or wall unit. Required mounting dimensions: 19" H x 29 1/8" W x 17 3/4" D. Or choose the modern Heathkit walnut cabinet that blends with any decor.

SAVE ON MAINTENANCE COSTS. The GR-22A's superb manual contains circuit diagrams and a "Servicing Hints" section. Add to this the familiarity you gain while building the set, and you're able to make repairs or adjustments yourself should it ever become necessary. No more costly TV service repair bills.

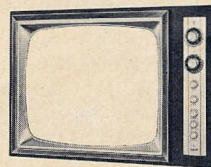
Kit GR-22A, chassis & tubes, 77 lbs. . . no money dn., \$16 mo. Express or Motor Freight Only, **\$169.00**

GR-22A SPECIFICATIONS—Picture Size: 22" diagonal, approximately 282 sq. in. Deflection: Magnetic, 90°. Focus: Electrostatic. Antenna input impedance: 300 ohm balanced. Tuning range: VHF TV channels 2-13 & UHF Channels 14-83. Picture IF carrier frequency: 45.75 MHz. Sound IF carrier frequency: 41.25 MHz. Sound IF: 4.5 MHz. Video response: to 3.2 MHz. Power requirements: 105 V. to 125 V. 60 Hz AC, 210 watts.

Deluxe TV Cabinet (Illustrated opposite page). Assembled. Walnut finish matches Heath Hi-Fi cabinets, pg. 42. Includes mask, mount. board, 6" x 9" speaker. Measures 36" W x 32 3/8" H x 20 1/2" D.

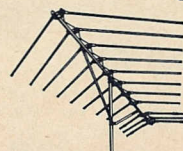
GRA-22-1, Walnut TV cabinet, 65 lbs. (Express or Motor Frt.) . . . no money dn., \$9 mo. **\$84.95**

GR-52A, TV set & walnut cabinet, 142 lbs. (Express or Motor Frt.) . . . Save \$8.95, no money dn., \$23 mo. **\$245.00**



TV Wall And Cabinet Mask Unfinished. Includes 3/4" thick mounting board. Cut & drilled. Required mounting space: 19" H x 17 3/4" D x 28 1/8" W. **GRA-22-5**, TV wall mount, 13 lbs. (Express or Motor Frt.) **\$23.50** **GR-62B**, TV set with wall mount, 90 lbs. (Express or Motor Frt.) Save \$7.50 . . . no money dn., \$18 mo. **\$185.00**

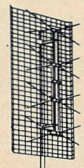
Save On These TV Accessories



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



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



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

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

Boasts Chimes, Rotating Leslie Speaker, Full-Size 44-Note Keyboards, Plus A Host Of Other Professional Organ Features... And YOU Can Build It

VERSATILE ENOUGH FOR THE PROFESSIONAL . . . SIMPLE ENOUGH FOR THE BEGINNER. And yet you don't have to be an "electronics wizard" to build it, nor a professional organist to play it. Famous Heathkit know-how reduces assembly to simple steps that require no special talents, tools or knowledge. And the Thomas "Musical Fun Book" is included to start you playing many favorites quickly. Has every feature you want in an organ. It's like having an entire orchestra at your fingertips. And all parts are made in the Thomas Factory.

17 RICH ORGAN VOICES . . . Diapason 16' & 8', Bass Clarinet 16', English Horn 8', Violin 8', Oboe 8', Bourdon 16', Flute 8', Flute D'Amour 4', Trumpet 16', Quint 5 1/2', Saxophone 8', French Horn 8', Cello 8', Chimes, Reverb, and Sustain . . . all at the simple touch of a tab. And you'll easily learn combinations to produce additional voices . . . Hawaiian guitar, vibraharp, harpsichord, zither, calliope, bagpipes, etc. And many different musical moods . . . classical, popular and religious.

TWO SEPARATE SPEAKER SYSTEMS . . . a built-in 2-speed rotating Leslie plus two 12" main speakers. With the Leslie system you can create the beauty of a full "theatre" organ, or the rich randomness of sound suitable for religious selections. And by playing both speaker systems at once, you produce an exciting "stereo" effect.

28 NOTES OF CHIMES . . . worth \$500 to \$2000 as an extra on other organs. Create hundreds of chime variations . . . carillon, cathedral, etc. **COLOR-TONE ATTACK, REPEAT AND SUSTAIN PERCUSSION** . . . create an infinite number of musical effects . . . xylophone, mandolin, marimba, banjo, string, etc. You can vary the rate of repeat percussion, and select short or medium sustain.

TWO FULL-SIZE 44-NOTE KEYBOARDS . . . tilted upper manual overhangs to bridge the two manuals easily.

MANUAL BALANCE . . . to adjust relative volume and accentuate either manual for solo work.

13-NOTE HEEL & TOE PEDALBOARD . . . range C through C.

PEDAL SUSTAIN . . . for special rhythm effects such as a string bass.

PEDAL VOLUME CONTROL . . . continuously variable. Allows regulating bass pedal volume to suit the mood of the music.

VIBRATO SWITCH . . . adds warmth and beauty.

EXPRESSION PEDAL . . . adjusts volume from a whisper to full majesty.

REVERB . . . to add concert-hall realism.

TREBLE ACCENT TAB . . . adds new clarity and brightness to solo work.

HEADPHONE OUTLET . . . play anytime without disturbing others.

ALL-TRANSISTOR 75-WATT EIA PEAK POWER AMPLIFIER . . . assures wide range, clear clean treble and full organ bass.

PRE-TUNED TONE GENERATOR . . . to tune the organ yourself by a simple counting method. No "musical" ear needed.

LUXURIOUS HARDWOOD CABINET AND BENCH . . . handcrafted and handrubbed with full-bodied walnut finish . . . ready for the sub-assemblies as you complete them. Cabinet measures 36" H. x 44" W. x 24" D.

NO EXTRAS NEEDED, NOTHING MORE TO BUY! There are no speakers, amplifiers, or other "hidden necessities" to add as with other organ kits. It's all there at one price . . . even the bench!

SAVE HUNDREDS OF DOLLARS! You can pay as much as a \$1000 more for other makes, and still not enjoy as many features as with the GD-983. You actually save hundreds of dollars over the factory assembled version.

Kit GD-983, Organ and matching bench, 245 lbs. . . (REA Express or Motor Frt. only), \$125 dn., as low as \$27 mo. **\$849.00**

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

Can't play a note? Learn quickly & easily at your leisure with this complete 40-lesson course on four 12" LP records. Includes music book with many old-time favorites. Provides firm basis of musical knowledge. Manufacturer's list price \$50.

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

Contains complete organ music & registration charts for both GD-983 and GD-325 Heathkit/Thomas Organs.

HELLO DOLLY . . . all words and music from this famous musical.

GDP-165, 1 lb. **\$2.00**

BERLIN'S BEST . . . "Always," "Say It Isn't So," 23 Berlin favorites.

GDP-135, 2 lbs. **\$2.50**

AROUND THE WORLD IN WALTZTIME . . . 14 waltz favorites, "Fascination," "My Wild Irish Rose," etc. . . .

GDP-155, 1 lb. **\$2.00**

Thomas Organ Music Books

Acclaimed By Experts & Owners Alike

Owner Carl H. MacAuley, Aberdeen, Wash.

"I think the tone and voices are far superior to three of the nationally advertised makes. The assembling was a delight—I was a little sorry when it was all done. I experienced no difficulty at all. The assembly manual is explicit and very easy to follow. Thank you for allowing a dream of a lifetime to come true—both in cost and pride of ownership."

Owner D. W. Welsh, Clinton, N. C.

"I have used this organ (GD-983) for about 5 months and am more fascinated by it each day. This is without a doubt the most value I've ever received for my money, I paid \$849.00 for it but I wouldn't sell it for \$2,000, if I couldn't replace it."

April Issue, High Fidelity Magazine

"The touch of the keyboard and other controls—gentle, yet positive—suggests, as one player put it, 'the fine breeding of this instrument.' As to its sound, it becomes quickly apparent that—electronics and do-it-yourself notwithstanding—this 'kit organ' is no toy or halfway-to-heaven gadget. It is rather a 'full fledged, deep throated, authentic-sounding organ that should interest the serious musician as well as the hobbyist and amateur. . . . Experienced kit-builders will recognize at once that this project is essentially no different in kind from that of building any audio-electronic gear. . . . Thanks to the excellent instruction manual and careful packaging of parts, the job should be within the range of most beginners at kits."

Editor, Hubert P. Luckett, Popular Science, March Issue

"You don't have to be an expert or know anything about electronics to complete the project. . . . Heath engineers have done an excellent job of programming the assembly so that you are never confused. . . . Unlike most kits you've seen, this one can be worked on by several people at a time without getting in each other's way. Ingenious circuit design in the kit-built job takes the development a step further and gives you much of the versatility and many of the special effects of a theater organ."

Professional Features For Versatile Performance



1. Sustain Tab 2. Reverb 3. Swell Keyboard Voices 4. On-Off And Pedal Volume 5. Pedal Tab 6. Pedal Sustain Tab 7. Great Keyboard Voices 8. Vibrato Tab 9. Treble Accent Tab 10. Headphone Jack 11. Leslie Speaker 12. Pedalboard 13. Manual Balance 14. Pilot Light 15. Chimes 16. Swell Keyboard 17. Great Keyboard 18. Leslie Rotor Switch 19. Leslie-Main Speaker Tab 20. Stereo Chorus 21. Color-Tone Percussion Tabs 22. Percussion Repeat Rate 23. Percussion Decay Tabs 24. Repeat Percussion Tab 25. Main Speakers 26. Expression Pedal

Hear It Perform Yourself

Send for your 7", 33 1/2 rpm Deluxe Organ Demonstration Record. Prove to yourself that the GD-983 has everything you've dreamed of in an organ. Use order blank in center of catalog & enclose 50c to cover handling & postage.

GDA-983-2, demonstration record. **50c**

Special Assembly & Adjustment Tools Included

Includes set of Nut Drivers, Phillips Screwdriver, coil alignment tool, keyboard alignment tool w/shaft handle, and nut starter for GD-983 assembly & adjustment.



LIGHT CLASSICS . . . "Serenade," "The Swan," 12 popular classics.

GDP-145, 1 lb. **\$2.00**

MANCINI MAGIC . . . "Dear Heart," "Charade," "I Love You and Don't You Forget It," 13 favorites by this famous modern composer.

GDP-335, 1 lb. **\$2.50**

SOUNDS OF BROADWAY . . . "Fiddler On The Roof," "Sunrise, Sunset," "Matchmaker," "Mr. Wonderful," 12 songs from popular Broadway shows.

GDP-345, 1 lb. **\$2.00**

**Heathkit® / Thomas BL-3 "Coronado"
Deluxe All-Transistor Organ . . .
Saves You Hundreds of Dollars
Over Comparable Factory Models**



GD-983

\$849⁰⁰Only \$125 dn., as low as \$27 mo.
(including bench)**5-Year Warranty!**

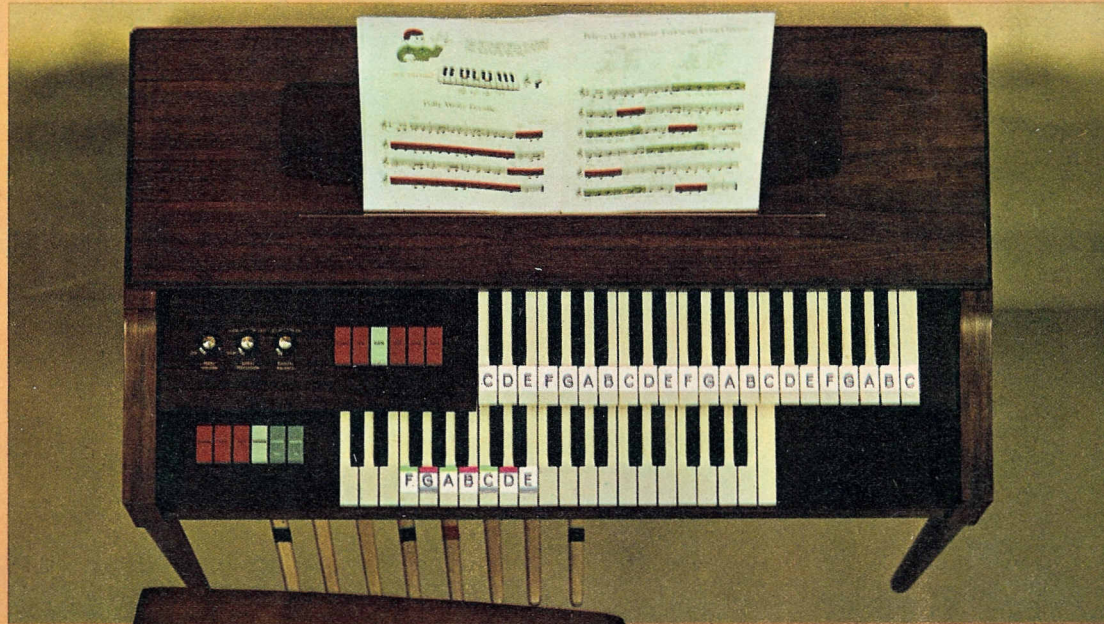
The transistorized plug-in tone generator boards, the heart of the organ, are warranted for five years. You buy with confidence when you buy a Heathkit version of the Thomas Organ. Replacement upon prepaid return of undamaged board to the Heath Company.



HOME
ENTERTAINMENT

You Play Complete Songs in Minutes Instead of Months with this NEW Heathkit® / Thomas Color-Glo Transistor Organ

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... even
if you've never played an or-
gan before!



Kit GD-325B
\$394⁹⁰
(including bench)

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.

Save Over \$150 By Building It Yourself! Features 10 Organ Voices . . . Matching Walnut Cabinet And Bench . . . Long-Life Transistor Circuitry

• 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 • 2 overhanging 37-note keyboards, range C thru C • 50 watt EIA 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, hand-rubbed walnut cabinet with matching bench . . . completely assembled

NO LONG, TEDIOUS HOURS OF STUDY Until now, the fun and satisfaction of playing a musical instrument has been achieved only after years of hard practice and study. Now . . . with this Color-Glo version of the Heathkit/Thomas "Artiste" . . . you start to play instantly. Special Color-Glo key lights show you the correct notes and chords to play complete songs . . . with melody, harmony and bass notes.

JUST MATCH UP THE COLORS AND THE LETTERS . . . IT'S EASY. Switch on the Color-Glo key lights, and you're ready to play. Each white key on the upper keyboard lights up with a letter for you to follow. You simply match the letters on the music with the letters on the keys, and automatically you 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).

BUT THAT'S NOT ALL. To add the rich 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 . . . and you play complete songs in minutes instead of months! The Color-Glo teacher is your secret.

Touch the switch again, and the Color-Glo key lights disappear, leaving a beautiful spinet organ console that will be the most admired piece of furniture in your living room.

ADD LIVE MUSIC TO PARTIES FOR MORE FUN . . . great for dancing or song fest when friends gather for an evening. Teens love the rhythm and bounce of its many musical effects, too. And playing this organ is a wonderful way to relax after a hard day.

TEN RICH ORGAN VOICES IN ALL Trombone, reed, flute, oboe, cornet, violin, saxophone, horn, viola, and diapason . . . all at the touch of a tab. Also features repeat percussion to create banjo and mandolin effects; 13-note bass pedals; variable expression pedal to change the volume; two levels of vibrato intensity; variable bass pedal volume; manual balance control; 12" speaker; and a 50-watt EIA peak music power amplifier.

INCLUDES HANDSOME WALNUT CABINET AND MATCHING BENCH. Nothing to add, no extras to buy as with other organ kits . . . everything is included at one price. Handcrafted walnut cabinet measures a compact 41¼" H x 39¾" W x 21½" D.

ASSEMBLES IN AROUND 50 HOURS . . . SAVE OVER \$150 Includes simple step-by-step instructions . . . genuine Thomas factory fabricated parts . . . diagrammed, easy-to-wire circuit boards . . . factory-assembled walnut cabinet that's ready for the sub-assemblies as you complete them. Takes no special skills or knowledge to build and you enjoy savings of \$150 over the same model factory assembled. You even tune the organ yourself with the pre-tuned tone generator using a simple counting method . . . no "musical ear" needed. Then relax and enjoy your newly discovered talent as you take the "light approach" to music . . . with instant-play Color-Glo.

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

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.

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

New, revised 40-Lesson course on four 12" LP records . . . provides a firm basis of musical knowledge. Includes comprehensive music book with many old-time favorites, and handsome gold-embossed white leatherette album. Learn quickly and easily at your leisure.
GDA-232-2, recorded lessons, 5 lbs. . . Mftrs. List \$50. only \$19.95

Full 5-Year Warranty

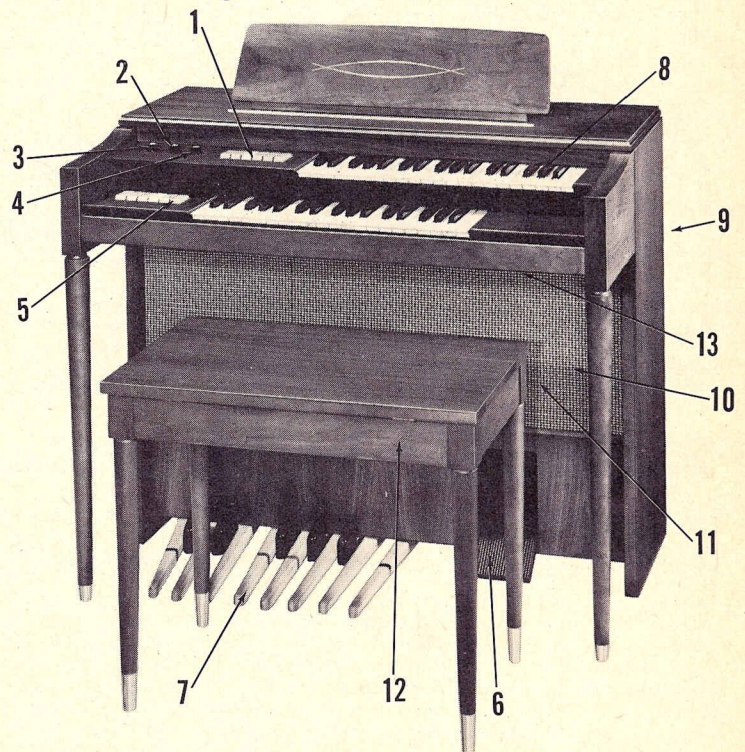
The transistorized plug-in tone generator boards, the heart of the organ, are warranted for five years. You buy with confidence when you buy a Heathkit version of the Thomas Organ. Replacement upon prepaid return of undamaged board to the Heath Company.

Special Assembly And Adjustment Tools Included



Includes a set of high quality Nut Drivers, a coil alignment tool, keyboard alignment tool with shaft handle, Phillips screwdriver and a nut start to help speed assembly and adjustment.

Compare These High Performance Features



1. 10 True organ voices; trombone, reed, flute, oboe, cornet, violin, saxophone, horn, viola, diapason 2. Variable Repeat Percussion; produces banjo, marimba, mandolin, and balalaika effects 3. Variable Bass Pedal Volume Control 4. Manual Balance Control, adjusts volume of keyboards in any degree for solo work 5. Variable Vibrato 6. Standard Expression Pedal; adjusts volume from soft to full 7. 13-note Heel & Toe Bass Pedals 8. Overhanging Keyboards; each with 37 notes, range C thru C 9. Beautiful Walnut Cabinet; modern styling, hand-rubbed, hand-crafted 10. All-Transistor Amplifier 11. 12" Speaker 12. Bench 13. Color-Glo Key Light Switch.

Additional Thomas COLOR-GLO Organ Music Books

COLOR-GLO MUSIC BOOK NO. 2 . . . contains words, music and "color-coded" charts for 56 favorites . . . "Beautiful Brown Eyes," "Camptown Races," "Home On The Range," "Joy To The World," "Goodnight Ladies." GDP-355, 1 lb. **\$2.50**
COLOR-GLO MUSIC BOOK NO. 3 . . . contains words, music and "color-coded" charts for 60 favorites . . . "Away In A Manger," "Bill Bailey," "Glow Worm," "How Dry I Am," "My Darling Clementine," etc. GDP-365, 1 lb. **\$2.50**
COLOR-GLO ORGAN COURSE, VOL. 1 . . . contains sections on using Color-Glo, legato, stop tabs, manual balance control, percussion, plus 21 song favorites. GDP-375, 1 lb. **\$2.50**
COLOR-GLO ORGAN COURSE, VOL. 2 . . . continues with sections on chords, scales, fingering, rhythm, plus 21 more song favorites . . . "Comin' Thru The Rye," "My Bonnie," "Down By The Riverside," etc. GDP-385, 1 lb. **\$3.00**



Eagerly Seeks Stations Far And Near . . . Deluxe AM/FM/FM All-Transistor Stereo Tuner

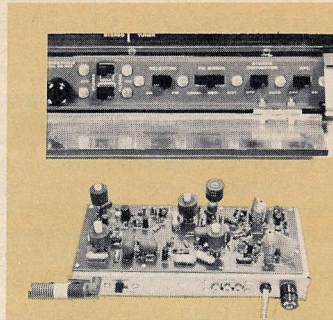
• 25-transistor, 9-diode circuit for pure, natural "transistor sound", heat-free operation • AM/FM/FM stereo tuning • Automatic stereo switching • Automatic stereo indicator light • Filtered outputs for direct, beat-free recording • Separate AM & FM tuning meters • Stereo phase control for maximum separation, 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

Just Push The Unique "Push-Push" Switch And Listen. You hear each voice, instrument and note like you've never heard it before. The sound is cleaner, more natural . . . thanks to the AJ-43D's solid-state circuitry. Notice the freedom from distortion and hum . . . the crisp, full reproduction that only transistors can achieve. Notice the cool, instant operation . . . the complete selection of AM, FM or FM stereo with hypersensitive reception. Notice the price . . . far below comparable factory-built units.

Compare Its High Performance Features. In addition to 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 (although it's hardly ever needed) to assure positive tuning. Plus emitter-follower output stages that eliminate 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.

3-Way Installation . . . Easy To Build. Installs just about anywhere . . . in a wall, your own custom cabinet or 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. Order yours now!

Kit AJ-43D, 15 lbs., less cab. for custom mtg. . . . \$109.00
No money down, \$11 mo. . . . \$109.00
Model AE-11, 8 lbs. . . Luxurious walnut wood cab. . . . \$12.95
Model AE-15, 8 lbs. . . Tan vinyl-clad steel cab. . . . \$6.95



Concealed Controls. Secondary controls on both AJ-43D tuner & AA-21D amplifier are protected by hinged lower front-panel from accidental system setting changes.

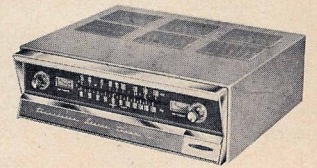
Fast Circuit Board Construction . . . with preassembled, prealigned "front-end" FM tuner and 4-stage FM IF circuit board for quick easy assembly.

AJ-43D SPECIFICATIONS—FM SECTION (Manual 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 each channel. Output voltage: 1 V. @ 1000 uv, 400 Hz 100% mod. **FM STEREO CONVERTER SECTION:** Converter band-pass: 50Hz to 53,000 Hz, ± 1/4 db. Channel separation: 35 db @ 50 Hz to 2,000 Hz; 30 db @ 10,000 Hz; 20 db @ 15,000 Hz. 19 kHz suppression: 50 db down. 38 kHz suppression: 45 db down. SCA rejection: 30 db min. 64 kHz to 70 kHz. Hum & noise: 55 db down. Output voltage: 1 V. @ 100 uv input, 400 Hz, 100% mod. Output impedance: (Emitter Follower) Variable to 3000 ohms each channel. **AM SECTION:** Tuning range: 535 to 1620 kHz. Intermediate frequency (IF): 455 kHz. Sensitivity: 600 kHz, 7 uv for 10 db S/N; 1000 kHz 4 uv for 10 db S/N; 1400 kHz 3 uv for 10 db S/N. Antenna: Built-in rod with provisions for external straight wire. Image rejection: 50 db at 600 kHz; 70 db at 1400 kHz IF rejection: 55 db at 600 kHz; 65 db at 1400 kHz. 10 kHz rejection: 40 db. Harmonic distortion: Less than 2%. Hum & noise: 30 db below 30% mod. Output impedance: (Normal) Variable to 3000 ohms; (Aux.) Variable to 4000 ohms. Output voltage: 1 volt nominal. Dimensions: 15 1/2" W x 5 1/4" H x 14 1/4" D.

Choice Of Cabinets For Installation Versatility

Less cabinet. Ideal for wall or custom mounting. Kit AJ-43D. . \$109.00

Luxurious walnut wood cabinet (illust. above) for AJ-43D. Ideal for open component installation on bookshelf or hi-fi cabinetry. Model AE-11 \$12.95



With Metal Cabinet

Tan vinyl-clad steel cabinet (illust. opposite) with polished aluminum trim for AJ-43D. Model AE-15 \$6.95

Natural "Transistor Sound" . . . Choice of Installation

Matching 100-Watt Stereo Amplifier . . . Accepts Any Source, Easily Drives Any Speaker

• 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

Plenty Of Clean, Uncompromising Power . . . a full 100 watts IHF music power, 70 watts RMS from 13 to 25,000 Hz at ± 1 db . . . with no faltering at either end of the response range. Add cool, hum-free operation . . . long, unchanging life (no tubes to deteriorate) . . . transparent, "transistor sound" . . . and host of deluxe operating features. This is the modern performance of the deluxe AA-21D.

Complete Controls. On the front panel, those you use most . . . 5-position source switch, 5-position mode switch, dual-concentric volume control, dual-concentric bass and treble controls. Concealed, but easily accessible behind the hinged lower front 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 or 16 ohm speakers, plus tape recorder . . . all on the rear chassis panel.

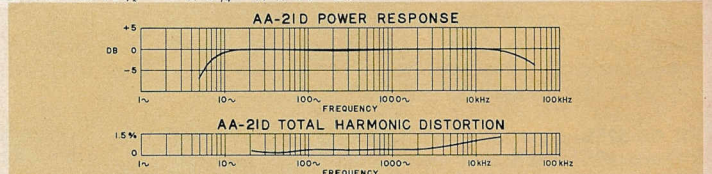
Advanced Circuitry. Transformerless output circuit and multiple feedback loops assure fine fidelity, low distortion, minimum phase shift. Easy to build with preamplifier circuits prewired and sealed in 6 epoxy-covered modules. Install in a wall, your own, or either Heath walnut or metal cabinet . . . matches AJ-43D tuner.

Kit AA-21D, 23 lbs. . . everything except a cabinet. . . No money down, \$13 mo. . . . \$137.00

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

Model AE-11, 8 lbs. . . walnut wood cabinet. . . . \$12.95
Model AE-15, 8 lbs. . . tan vinyl-clad steel cab. . . . \$6.95

AA-21D SPECIFICATIONS—RECOMMENDED SYSTEM MATES: Separate Speaker: AS-183 pg. 40. Speaker Systems: AS-2AU, AS-10, pg. 37. All changers & turntables, ppg. 31-32 & 33. **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 kHz @ rated output; ± 3 db from 8 Hz to 40 kHz @ rated output. **Harmonic distortion (at rated output):** Less than 1% @ 20 Hz, 0.5% @ 1 kHz, 2.0% @ 20 kHz. **Intermodulation distortion (at rated output):** Less than 1%, 60 & 6,000 Hz signal mixed 4:1. **Hum & noise:** Tapehead, 40 db below rated output; Mag. phono, 45 db below rated output; Aux. inputs, 60 db below rated output; Tape monitor, 70 db below rated output. **Channel separation:** 40 db min. @ 20 kHz 55 db min. @ 1 kHz 50 db min. @ 20 kHz. **Input sensitivity:** (For 35 watts output per channel, 8 ohm load) Tapehead, 2 mv, Mag. phono, 3 mv; Tuner, 250 mv; FM Stereo, 250 mv; Aux., 250 mv; Tape Monitor, 0.6 V. **Input impedance:** Tapehead, 60 k ohm; Mag. phono, 30 k ohm; Tuner, 100 k ohm; FM Stereo, 100 k ohm; Aux., 100 k ohm; Tape monitor, 47 k ohm. **Outputs:** 4, 8 or 16 ohms and low impedance tape recorder outputs. **Controls:** 5-pos. Selector (dual concentric), 5-pos. Mode switch, dual-concentric Volume, Bass & Treble controls, Tape monitor sw., Loudness sw., Phase sw., Input level controls (all inputs except Tape Head & Tape Monitor inputs), Push-Push on/off switch. **Semiconductor complement:** 26 Transistors, 10 diodes. **Power requirements:** 105-125 volts, 50-60 Hz AC. 35 watts idling, no signal; 200 watts, full power out, @ 120 volts with no load on AC receptacles. **Power outlets:** 2 AC receptacles, 1 switched, 1 unswitched. **Dimensions:** 15 1/2" W x 5 1/4" H x 14" D.



Choice Of Cabinets For Installation Versatility

Less cabinet for custom mounting in a wall or panel. Kit AA-21D \$137.00

Luxurious walnut wood cabinet (illust. above) for AA-21D. Ideal for open component installation on bookshelf or hi-fi cabinetry. Model AE-11 \$12.95

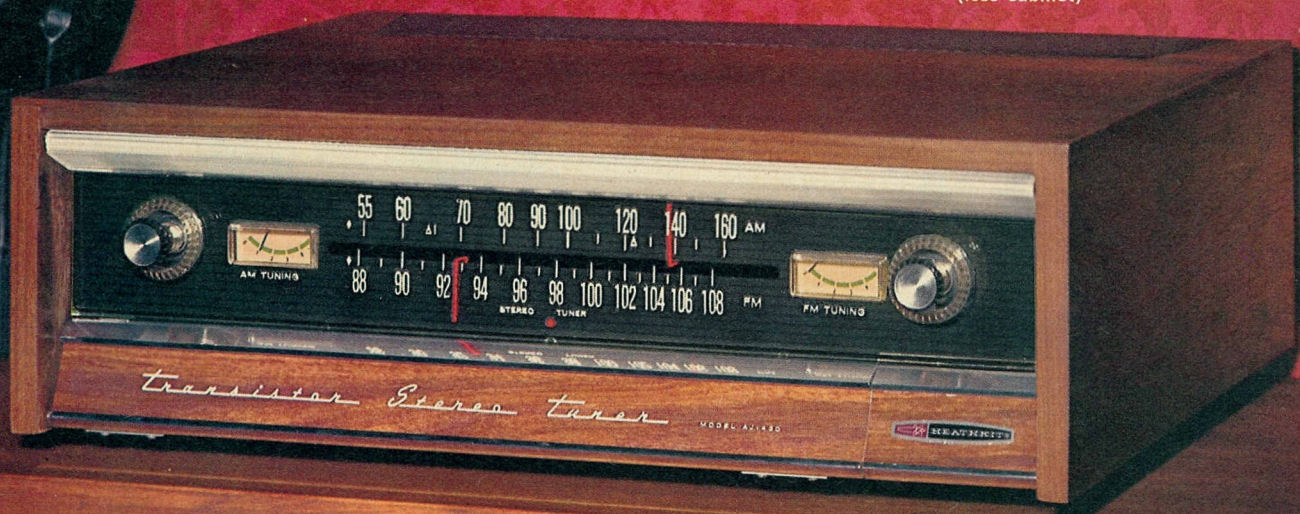
Tan vinyl-clad steel cabinet (illust. opposite) with polished aluminum trim for AA-21D. Model AE-15 \$6.95



With Metal Cabinet

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

AJ-43D
\$109⁰⁰
(less cabinet)

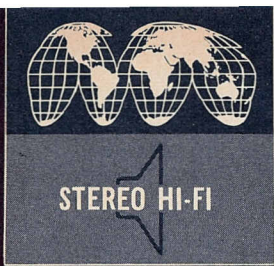


... *Deluxe Solid-State Stereo Separates*



AA-21D
\$137⁰⁰
(less cabinet)





America's Best Buys



AR-13A
\$184⁰⁰

**Acclaimed By Experts . . . Praised By Owners . . .
Heathkit All-Transistor 66-Watt AM/FM/FM
Stereo Receiver . . . Handles Any Music Source . . .
Has Power To Spare**

- 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 pre-amplifiers . . . 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

JUST ADD TWO SPEAKERS AND ENJOY. There's wideband AM, FM, and FM stereo tuning to satisfy any listening wish. It has two pre-amps, and coupled with its two power amplifiers, the AR-13A provides 66 watts of IHF music power, 40 watts of continuous sine-wave power at ± 1 db from 15 to 30,000 Hz. All this is housed inside one luxurious, compact walnut cabinet . . . just connect two speakers for a complete FM stereo system!

DELUXE FEATURES ADD CONVENIENCE, IMPROVE PERFORMANCE. A solid-state circuit automatically channels the signal through the built-in stereo adapter when stereo is received. Then the automatic stereo indicator lights. The tape recorder outputs are filtered for direct "beat-free" recording. There are dual-tandem controls for simultaneous adjustment of volume, bass, and treble of both channels; a separate control for balancing both channels; and 3 stereo inputs—mag. phono and two auxiliaries. The AM tuner features a high gain RF stage and a high Q rod antenna. The FM tuner has a built-in line cord antenna plus external antenna connectors.

AND THAT'S NOT ALL. There's a local-distance switch for optimum reception in all signal areas; an FM squelch control; AFC for drift-free reception; plus flywheel tuning, tuning meter, and lighted AM and FM slide-rule dials for fast, easy station selection. The secondary controls are concealed under the hinged lower front section of the gold anodized aluminum front panel to prevent accidental system setting changes. Both FM front-end and the AM-FM I.F. strip are pre-assembled and aligned to simplify kit assembly. Walnut cabinet is included.

Kit AR-13A, 35 lbs. . . no money dn., \$18 mo. \$184.00
Export model available for 115/230 VAC, 50-60 Hz; write for prices.
Important: The AR-13A is exempt from any Special System Discount.

AR-13A SPECIFICATIONS — Recommended system mates: Speaker systems: AS-10 or AS-51, ppg. 37-38; separate speaker: AS-183, pg. 40; all changers, ppg. 31, 32 & 33.
AMPLIFIER: Power output per channel (Heath Rating): 20 watts/8 ohm load, 13.5 watts/16 ohm load, 9 watts/4 ohm load. (IHF Music Power Output): 33 watts/8 ohm load, 18 watts/16 ohm load, 12 watts/4 ohm load @ 0.7% THD, 1 kHz. **Frequency response:** ± 1 db from 15 Hz to 30 kHz @ rated output; ± 3 db from 10 Hz to 60 kHz @ rated output. **Harmonic distortion (at rated output):** Less than 1% @ 20 Hz; less than 0.3% @ 1 kHz; less than 1% @ 20 kHz. **Intermodulation distortion (at rated output):** Less than 1%, 60 & 6,000 Hz signal mixed 4:1. **Hum & noise:** Mag. phono, 50 db below rated output; Aux. inputs, 65 db below rated output. **Channel separation:** 40 db @ 20 kHz, 60 db @ 1 kHz, 40 db @ 20 Hz. **Input sensitivity: (for 20 watts output per channel, 8 ohm load):** Mag. phono, 6 mV; Aux. 1, .25 v; Aux. 2, .25 v. **Input impedance:** Mag. phono, 35 K ohm; Aux. 1, 100 K ohm; Aux. 2, 100 K ohm. **Outputs:** 4, 8, & 16 ohm and low impedance tape recorder outputs. **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:** 1 1/2 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:** $\pm 1/4$ 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 38 kHz Suppression:** 45 db down from rated output at 1 kHz. **SCA Rejection:** 35 db down from rated output. **AM Tuning Range:** 535 to 1,620 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 5 1/2" H x 16" D. **Power requirements:** 105-125 volts, 50-60 Hz AC, 30 watts idling. 110 watts max.

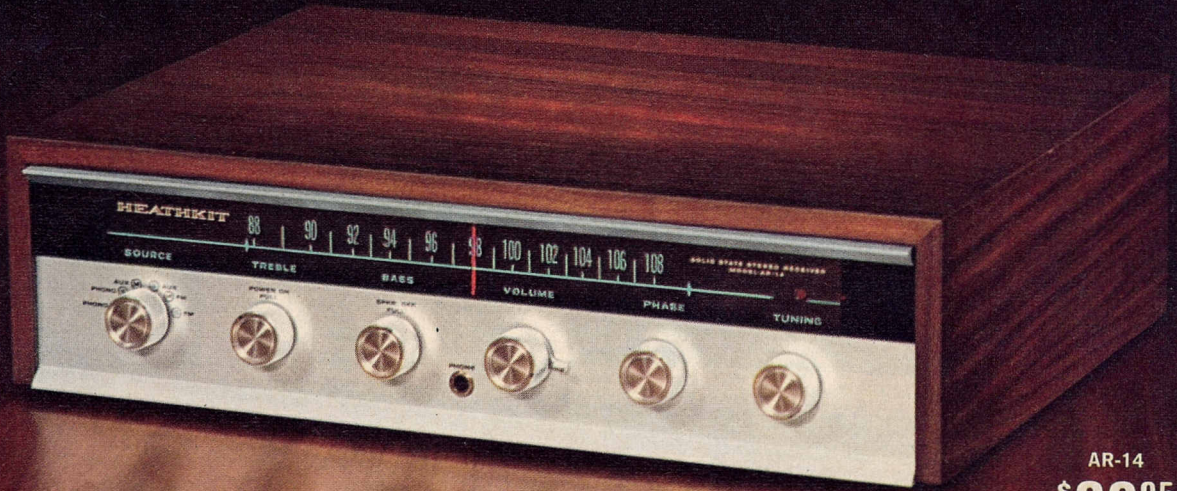
Julian D. Hirsch On The AR-13A

In the Nov. '65 issue of *Hi-Fi/Stereo Review*, Mr. Hirsch said: "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 was excellent". . . "It is one of the finest integrated stereo receivers I have seen, comparable to many factory-wired tuners costing far more."

ELECTRONICS WORLD Reviews The AR-13A

"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."

In Solid-State Stereo Receivers



AR-14
\$99.95
 (less cabinet)

Only Your Budget Can Tell The Difference Between Its Performance And Price . . . Heathkit All-Transistor 30-Watt FM/FM Stereo Receiver

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

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.

NEW TRANSFORMERLESS OUTPUT CIRCUIT . . . each channel uses two output transistors—a complementary PNP and NPN pair. This design has proven superior with lower phase shift and distortion, plus wider response.

FRONT PANEL STEREO HEADPHONE JACK . . . for private listening without disturbing others. Other controls include a 6-position source switch to handle your tapes and 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 an automatic stereo indicator light. For beat-free stereo taping, the tuner outputs are filtered. And the output power drives all but the most inefficient speakers.

BOOKSHELF SIZE . . . 3-WAY INSTALLATION. Measures only 3 $\frac{3}{8}$ " H. x 15 $\frac{1}{4}$ " W. x 12" D. Looks sleek and modern with its attractive anodized aluminum front panel that fits neatly in a wall, your custom cabinet or either optional Heath walnut veneer and beige steel cabinets. Marry it with a pair of speakers for superb listening at lowest cost.

AUDIO Magazine, March '66 Issue 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. At a kit price of \$99.95, the AR-14 represents an exceptional value. For where else can one obtain an FM-Stereo receiver at such a price? And the low price has not been reached by any apparent sacrifice in quality."

AR-14 Owner, Mr. Raymond J. Zoghby, Prichard, Ala.:

"I have completed the AR-14 Stereo Receiver in only a few nights work, and it works perfectly! I have never put together any kit of any kind; but this was easy thanks to the way your directions and illustrations were presented. I had no trouble and did not have to go back and correct anything; everything worked perfectly the first time!"

Kit AR-14, 18 lbs., less cabinet for custom mounting. . . .
 no money down, \$10 mo. . . . \$99.95
 Model AE-55, 6 lbs., walnut veneer cabinet. . . . \$9.95
 Model AE-65, 6 lbs., beige steel cabinet. . . . \$3.95
 Export model available for 115/230 VAC, 50-60 Hz; write for prices.
Important: The AR-14 is exempt from any Special System Discount.

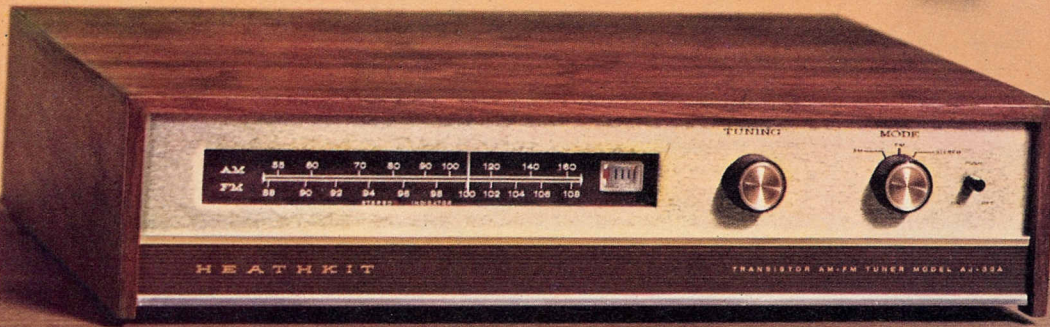
AR-14 SPECIFICATIONS—Recommended system mates: All speakers & speaker systems, ppg. 37 thru 41, except AS-2A & AS-2U; all changers & turntables, ppg. 31, 32, 33.
AMPLIFIER: Continuous power output: 10 watts each channel—20 watts total. **Music power output (IHF):** 15 watts per channel. **Speaker output 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: 180K ohm. **Channel separation:** 45 db or better. **Total harmonic distortion (at rated output):** 5% or less @ 100 Hz; 1% or less @ 20 & 20,000 Hz. **Intermodulation distortion (at rated output):** Less than 1% (60 & 6,000 Hz, 4:1). **Phono equalization:** RIAA. **Front panel:** 6-position Source Switch: Mono-Phono; Stereo Phono; Mono Auxiliary; Stereo Auxiliary; Mono FM; Stereo FM; Volume Control; Bass Control; Treble Control; Phone Jack. **Rear panel:** Fuse AC Power Socket: Switched & Unswitched. Speaker Terminal Blocks; One Left & One Right Speaker Ground Terminals; 1; Triple Phone Sockets. **Power requirement:** 105-125 volts 50/60 Hz; 32 watts idling; 65 watts full output; (No load on AC power sockets). **Dimensions:** Overall 15 $\frac{1}{4}$ " W x 3 $\frac{3}{8}$ " H x 12" D. **Mounting position:** Horizontal or Vertical; Cutout required 15 $\frac{1}{2}$ " x 3 $\frac{1}{2}$ "; Depth required from front of mounting surface 11 $\frac{1}{2}$ ". **FM: Tuning range:** 88-108 MHz. **Antenna:** Balanced input for external 300 ohm antenna. **Intermediate frequency:** 10.7 MHz. **Sensitivity: (IHF):** 5 uv for less than 3% total noise, distortion hum —30 db. **Hum & noise (IHF):** —50 db. **Audio frequency response (IHF):** 0 to —3 db from 20 to 15,000 Hz. **Harmonic distortion (IHF):** 1% or less. **Image ratio (IHF):** —45 db. **Capture ratio (IHF):** 3 db. **AFC correction:** 150 kHz per volt. **AM suppression (IHF):** —35 db. **IF rejection (IHF):** —80 db. **FM STEREO: Separation:** 30 db @ 1 kHz.

Shop The Easy Heathkit Way—Select Your Kits In The Comfort Of Your Home, Mail Your Order, & Get Direct-To-Your-Door Delivery



STEREO HI-FI

AJ-33A
\$94⁵⁰



- 23 transistor, 8 diode circuit
- Built-in multiplex stereo circuitry
- Automatic Frequency Control for positive tuning
- Stereo indicator light
- Filtered stereo outputs
- Stereo phase control for maximum separation, minimum distortion
- Includes rich walnut cabinet
- Matches AA-22 amplifier

Radio-Electronics Magazine On The AJ-33A: ". . . 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! And noise, which previously seemed inevitable with distant reception is astoundingly low. The quality is indistinguishable from high-quality record reproduction."

AJ-33A Owner, Mr. D. W. Welsh, Clinton, N. C.: "My AJ-33 tuner and AA-22 amplifier have been in use for about 10 months at 12 to 15 hours per day, operating "cool as a cucumber", completely trouble-free and with excellent quality and channel separation."

Acclaimed by Experts... Praised by Owners...

- 20 transistor, 10 diode circuit
- Delivers full 66 watts IHF music power, 40 watts continuous at ± 1 db from 15 to 30,000 Hz
- Less than 1% distortion
- 5 stereo inputs handle any program source
- Secondary controls concealed and protected under hinged lower front panel
- Handsome pre-assembled walnut cabinet . . . modern low silhouette styling . . . matches AJ-33 tuner

Julian D. Hirsch, Hi-Fi/Stereo Review On The AA-22: "I operated it at full power for long periods, and frequently overdrove it mercilessly, without damage to the transistors, and with no change in its performance measurements." "Any enthusiasm I may seem to express for this unit, incidentally, is purely intentional."

AA-22 Owner Mr. John M. Libenow, Los Angeles, Calif.: "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."

AA-22
\$99⁹⁵



Slim, Compact Styling . . . Clean "Transistor Sound" . . . Low Cost AM/FM/FM Stereo Tuner

Complete Listening At Your Command . . . the quiet beauty of FM, the stirring realism of FM stereo, or the music, news and sports of AM . . . it's all there with just a flip of a switch on the AJ-33A. It's all solid-state . . . 23 transistors, and 8 diodes in all . . . for cool, instant play that's free from microphonics. And since there aren't any tubes to deteriorate, the AJ-33A's life is long and dependable. And the sound is clean, natural and robust. It's all there at one low price . . . including the handsome walnut cabinet.

Advanced Features For Superb Performance. A built-in stereo demodulator automatically separates the stereo signal into both channels. A stereo indicator lights when stereo is broadcast. An automatic gain control prevents overload distortion. An automatic frequency control "snaps in" each FM station, and keeps it there. There's even a phase control for maximum stereo separation with minimum distortion. Both channels are filtered for direct, beat-free recording. And the tuning meter, lighted slide-rule dial and flywheel assure precision tuning. A voltage regulated power supply provides high stability, and the adjustable FM squelch obliterates annoying between-station noise while dialing across the band.

Concealed, Easy-To-Reach Secondary Controls. A hinged lower front panel protects the secondary controls . . . adds to the neat, over-all appearance. And yet, they are still convenient to reach. Only the on/off switch, AM/FM/Stereo mode switch and tuning knob are in open view. Greatly simplifies operation . . . a feature the rest of the family will appreciate.

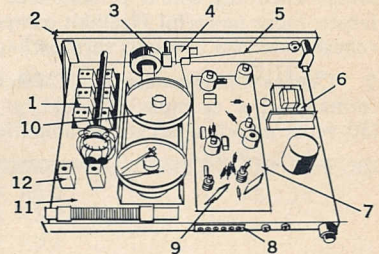
Includes Luxurious Walnut Cabinet. Add to this the extruded brushed gold anodized aluminum front panel, and you have a stereo component

that enriches any surroundings. Marry it to the AA-22 amplifier below, for modern styling and performance.

Kit AJ-33A, 16 lbs. . . no money dn., \$10 mo. \$94.50

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: $\pm 1/4$ 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: 15 3/8" W x 3 3/4" H x 11 1/2" D.

1. Pre-assembled pre-aligned AM/FM IF strip.
2. Gold anodized extruded aluminum front panel.
3. Flywheel tuning.
4. Tuning meter.
5. Stereo indicator light.
6. Transformer operated power supply.
7. Built-in stereo demodulator.
8. Built-in line antenna (FM).
9. 38 kc output filter.
10. Preassembled, prealigned FM front end.
11. AM, RF amplifier stage.
12. Superheterodyne circuitry.



Heathkit® Solid-State Stereo Twins



66 Watts Of Transistor Power . . . Handles Any Program Source . . . Matching All-Transistor Stereo Amplifier

Enjoy The Sound That Only Transistors Can Give You . . . pure uncompromising sound with instantaneous bursts of power as the music demands . . . a full 40 watts RMS, 66 watts IHF music power from 15 to 30,000 Hz at ± 1 db. Enjoy effortless transient response . . . freedom from heat and microphonics . . . and long, unchanging life. As audio expert Julian D. Hirsch said in a review of the AA-22 in HI-FI/STEREO REVIEW: "The power response curve of this amplifier is one of the flattest I have ever measured" . . . "Its RIAA phono equalization was one of the most precise I have ever measured" . . . "The hum and noise of the amplifier were inaudible".

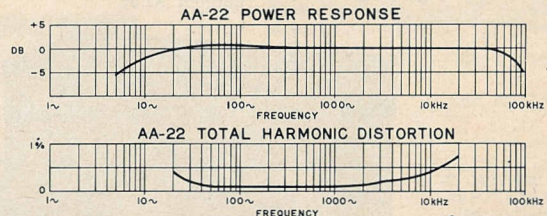
Handles Any Program Source. 5 stereo inputs accommodate stereo mag. phono, stereo-mono tuners, stereo tape recorders and two auxiliary sources. And there are outputs for 4, 8 or 16 ohm speakers, plus filtered outputs for direct stereo taping. A driver transformer in the output circuit assures greater stability and efficiency.

Versatile Controls Put You In Full Command. On the front panel . . . 5-position source selector switch, a 3-position "mode" switch, dual-tandem volume, bass and treble controls, and a push-push on/off switch. The hinged lower front panel conceals all secondary controls such as the input level controls, balance control and speaker phase switch . . . no need to worry about accidental system setting changes.

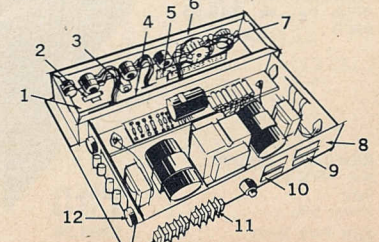
Attractive Low-Silhouette Styling. Handsome factory-assembled walnut cabinet, extruded aluminum brush-gold front panel and matching brown knobs with spun gold insets . . . matches AJ-33A tuner. A handsome pair that will "fit-in" just about anywhere. They look great, sound great . . . especially in your living room.

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

AA-22 SPECIFICATIONS—RECOMMENDED SYSTEM MATES: Speakers: AS-21, page 39; AS-10, page 37; AS-51, page 38; AS-183 and 173, page 40; AS-163, 153 and 133, page 41; all changers and turntables, pgs. 31, 32, & 33. **Simultaneous power output per channel:** (Heath Rating). 20 watts/8 ohm load, 13 watts/16 ohm load, 9 watts/4 ohm load. (IHF music power output) 33 watts/8 ohm load, 18 watts/16 ohm load, 16 watts/4 ohm load @ 0.7% THD, 1 kHz. **Power response:** ± 1 db from 15 Hz to 30 kHz @ rated output. ± 3 db from 10 Hz to 60 kHz @ rated output. **Harmonic distortion: (at rated output)** Less than 1% @ 20 Hz. 0.3% @ 1 kHz. 1% @ 20 kHz. **Intermodulation distortion:** (at rated output) Less than 1%, 60 and 6,000 Hz signal mixed 4:1. **Hum and noise:** Mag phono, 50 db below rated output. Aux. inputs, 65 db below rated output. **Channel separation:** 40 db @ 20 Hz 60 db @ 1 kHz, 40 db @ 20 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 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:** 15 3/8" W x 3 3/4" H x 11 1/2" D.



1. Circuit Modules.
2. Front Panel mounted Speaker phase switch.
3. Channel Balance Control.
4. Circuit Board Construction.
5. Front panel mounted input level controls.
6. Gold anodized extruded aluminum front panel.
7. Three-color mode indicator lights.
8. Accessory grounding terminal.
9. Five stereo inputs.
10. Low impedance tape recorder outputs.
11. Transformerless 4, 8, and 16 ohm outputs.
12. RCA germanium drift field power transistors.



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.

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

Order A Stereo System—Save 5%

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,

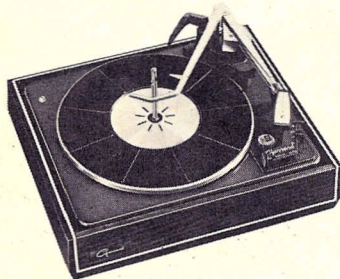
pg. 16, and connect to speakers that are only capable of reproducing 10 watts per channel. Just remember that a music system is only as good as its weakest link.

4. **Select A System That Fits Your Budget.** Heath offers a selection of components to fit any budget, any listening taste. Below and on the opposite page are a number of recommended Heath stereo systems. If none of these fits your needs, then simply make up your own system—just include any combination of music source (tuner, record player, tape recorder), amplifier, and speaker or speaker system—and deduct 5% from the total cost. The only Heathkit audio components *not* eligible for discount are the AR-13A and AR-14 stereo receivers pg. 18.

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

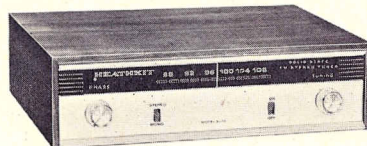
Recommended Low Cost Stereo Systems

Versatile Mid-Priced Stereo System . . . Save \$13.43



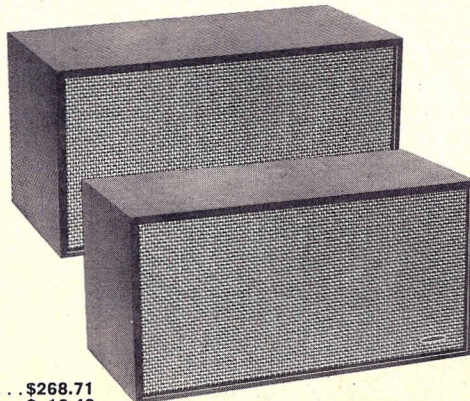
ADP-46 Garrard 40 MK II Stereo Record Changer with choice of 1c cartridge, pg. 31, \$44.51 plus ADA-66-1 walnut base, \$4.50

Heathkit AJ-14 Transistor FM/FM Stereo Tuner, pg. 24, \$49.95 plus matching AE-25 walnut cabinet, \$7.95



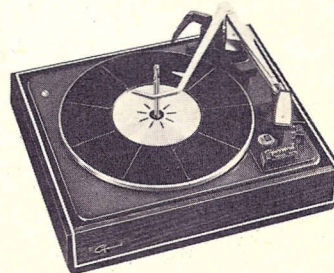
Heathkit AA-14 Transistor 30-Watt Stereo Amplifier, pg. 24, \$59.95, plus matching AE-25 walnut cabinet \$7.95

Heathkit AS-51W 2-Way Speaker Systems in walnut cabinets, pg. 38, \$46.95 each



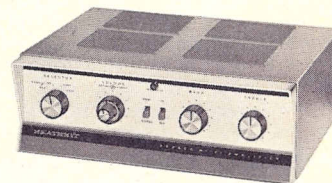
Complete System
Kit HFS-82
Reg. \$268.71
Save 5% \$ 13.43
You Pay Only \$255.28

Save \$8.79 On This Low-Cost Stereo System



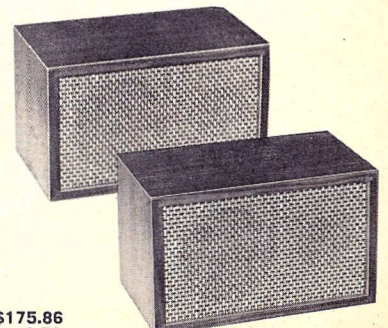
ADP-46 Garrard 40 MK II Stereo Record Changer with choice of 1c cartridge, pg. 31, \$44.51, plus ADA-66-1 walnut base, \$4.50

Heathkit AJ-13 FM/FM Stereo Tuner, pg. 34, \$47.00



Heathkit AA-32 20-Watt Stereo Amplifier, pg. 34, \$39.95

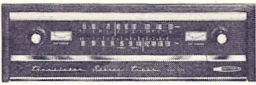
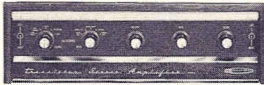


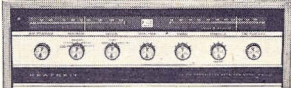



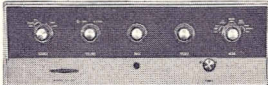




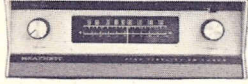

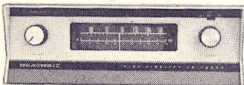
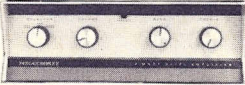
Heathkit AS-81W Hi-Fi Speaker Systems, in walnut cabinets, pg. 39, \$19.95 each



Complete System
Kit HFS-80
Reg. \$175.86
Save 5% \$ 8.79
You Pay Only \$167.07

Your Planning Guide To A Custom Stereo System

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

RECORD PLAYERS (or Tape Recorder)	TUNERS AND AMPLIFIERS	SPEAKER SYSTEMS OR SPEAKERS ² (ORDER 2 FOR STEREO)		
TOP OF THE LINE STEREO				
	 AJ-43D AM, FM STEREO TUNER	 AA-21D AMPLIFIER	AS-15 or AS-21 or AS-2A or AS-2	AS-183 or AS-173
ADP-24 ADP-55 ADP-86 ADP-76 (AD-16)	 AJ-33A AM, FM STEREO TUNER	 AA-22 AMPLIFIER	AS-15 or AS-21 or AS-10	
	AR-13A AM, FM STEREO RECEIVER		AS-15 or AS-21 or AS-10	AS-183 or AS-173 or AS-163 or AS-153
	 AJ-41 AM, FM STEREO TUNER	 AA-100 AMPLIFIER	AS-15 or AS-21 or AS-2A or AS-2 or AS-10	
MEDIUM PRICED STEREO				
ADP-56 ADP-66 ADP-46 ADP-76 (AD-16)	 AJ-12 FM, FM STEREO TUNER	 AA-151 AMPLIFIER	AS-15 or AS-10 or AS-51	AS-163 or AS-153
	 or AJ-32 AM, FM, FM STEREO			
LOW COST STEREO				
ADP-56 ADP-66 ADP-46 (AD-16)	AR-14 FM STEREO RECEIVER		AS-15 or AS-21 or AS-10 or AS-51 or AS-81 or AS-41	AS-183 or AS-173 or AS-163 or AS-153 or AS-133
	 AJ-14 FM, FM STEREO TUNER	 AA-14 AMPLIFIER		
MONO SYSTEMS				
ADP-56 ADP-46 or ADP-66	 AJ-53 AM TUNER	 AA-23 HIGH POWER AMP	AS-10 or AS-51	AS-173 or AS-163 or AS-153
	 and/or AJ-63 FM TUNER	 AA-13 MEDIUM POWER AMP	AS-10 or AS-41	AS-153 or AS-133 or AS-123

- NOTES: 1. AA-100 and AA-21D will operate directly from tape head. All other amplifiers require tape head preamps.
 2. Individual speakers must be provided with suitable acoustic enclosures, or home-built to included instructions.
 3. All interconnecting cables provided except speaker wire.
 4. Tuners are not needed for playback of only records or tapes. Amplifiers shown are complete.



World's Best Values In Transistor Stereo Separates... Heathkit® Lowest Cost Solid-State Stereo

**To Get 1967 Performance At 1947 Prices . . .
Build This New Solid-State FM/FM Stereo Tuner**

- 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! The ingredients? Just one package of high quality AJ-14 parts for only \$49.95 . . . easily prepared in just 4 to 6 hours. Results? The deliciously natural sound of transistor stereo in a compact unit that plays it cool . . . no heat or microphonics.

HEATH'S EASIEST-TO-BUILD STEREO KIT. Just one simple circuit board on which to mount the parts. One factory assembled and aligned "front-end" to install. And a few miscellaneous parts that mount quickly on the chassis. All you need are a few simple tools. The famous Heathkit step-by-step instructions and king-size pictorials guide you all the way.

MODERN SOLID-STATE CIRCUITRY. 14 transistors, 5 diodes in all. 3 transistors in the "front-end" (containing an RF amplifier and separate local oscillator) tuning section . . . 4 transistors in the 4-stage I.F. section produce sensitivity and selectivity comparable to far more expensive tuners. The transformer-operated power supply is solid-state, too . . . and the outputs are filtered for clean stereo tape recordings.

Matching 30-Watt Transistor Stereo Amplifier . . . Easy 10-Hour Assembly, Wide 15-50,000 Hz Response, Performs Like It Costs Twice As Much

- 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

COMPARES TO UNITS SELLING FOR OVER \$100 . . . that's the new AA-14 30-Watt stereo amplifier . . . with the ability to handle virtually any source, plus the cool, instant operation and natural beauty of transistor sound . . . yet costs far below comparable units.

FEATURES TWO IDENTICAL, but separate power amplifiers and preamplifiers that deliver a cool 30 watts IHF music power (20 watts RMS) at ± 1 db over an extremely wide range of 15 to 50,000 Hz . . . thanks to a generous power supply design. Its new transformerless output circuit is known as complementary design. Each channel uses two output transistors—a PNP type and an NPN type—complementary. This has proven superior, exhibiting lower phase shift, wider response, and lower distortion. All power transistors are adequately heat-sinked for long life.

COMPLETE OPERATING CONVENIENCE. A 6-position source switch easily 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; an edge-lighted dial that indicates all functions; and a front-panel mounted stereo headphone jack plus a speaker-off switch for private listening.

EASY TO BUILD . . . with fast circuit board construction and famous Heathkit assembly instructions . . . from parts to performance in about 10 hours.

COMPACT SIZE . . . CHOICE OF 3-WAY INSTALLATION. The same size as its matching AJ-14 Tuner, 9 $\frac{3}{4}$ " D x 2 $\frac{7}{8}$ " H x 11 $\frac{3}{4}$ " W . . . easily snuggles into bookshelves, on top of mantles, or installs in

JUST 4 SIMPLE CONTROLS TO OPERATE . . . all on the front panel . . . On-Off switch, flywheel Tuning knob, Mono-Stereo switch, and Stereo Phase control to insure maximum separation. You'll like the convenience of the stereo indicator light that signals when a stereo station is being received. And specially-designed filters are incorporated to remove SCA interference. The slide-rule dial is lighted to insure easy, accurate station selection. And there are connectors on the rear chassis panel for an external antenna.

BOOKSHELF SIZE . . . 3-WAY INSTALLATION! Measures only 9 $\frac{3}{4}$ " D x 2 $\frac{7}{8}$ " H x 11 $\frac{3}{4}$ " W . . . ideal for installing in a wall, your own custom cabinet or either Heath metal or walnut veneer cabinets. Pair it with the matching AA-14 Amplifier for solid-state listening at lowest cost.

Kit AJ-14, 6 lbs. . . . (less cabinet for custom mounting) . . . no money down, \$5 mo. **\$49.95**

Model AE-35, 4 lbs., beige metal cabinet. **\$3.50**

Model AE-25, 4 lbs. . . . genuine walnut veneer cabinet. **\$7.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

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

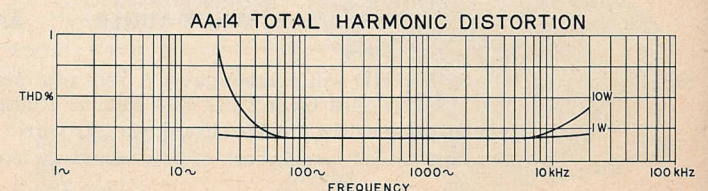
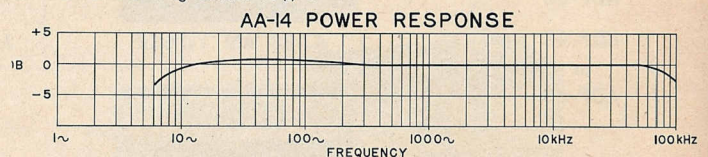
a wall. You can fashion your own custom cabinet around it, or choose either the Heath metal or walnut veneer cabinets. The brushed anodized aluminum front panel is quietly elegant in any setting.

Kit AA-14, 11 lbs. . . . less cabinet for custom mounting, no money down, \$6 mo. **\$59.95**

Model AE-35, 4 lbs. . . . beige metal cabinet. **\$3.50**

Model AE-25, 4 lbs. . . . genuine walnut veneer cabinet. **\$7.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AA-14 SPECIFICATIONS—Recommended system mates: All speakers & speaker systems, ppg. 37, 38, 39, 40, 41 except AS-2A, AS-2U, AS-10U, all changers & turntables, ppg. 31, 32, 33. Continuous power output: 10 watts each channel — 20 watts total. Music power output (IHF): 15 watts per channel. Output impedance: 4 through 16 ohm. Damping factor: 50 or better. Hum and noise: Phono: —60 db; Tuner: —63 db; Auxiliary: —63 db. Frequency response: 12 to 60,000 Hz ± 1 db; 6 to 100,000 Hz ± 3 db. Power response: 15 to 50,000 Hz ± 1 db; 7 to 90,000 Hz ± 3 db. Input sensitivity: Phono: 4.5 mv; Tuner: 300 mv; Auxiliary: 300 mv. Input impedance: Phono: 47K ohm; Tuner: 180K ohm; Auxiliary: 180K ohm. Channel separation: 45 db or better. Total harmonic distortion (at Full Output): .5% or less @ 1000 Hz; 1% or less @ 20 & 20,000 Hz. Intermodulation distortion (at Rated Output): Less than 1% (60 and 6,000 Hz, 4:1). Phono equalization: RIAA. Front panel: 6-Position Source Switch: Mono phono; Stereo phono; Mono tuner; Stereo tuner; Mono Auxiliary; Stereo Auxiliary; Volume Control; Bass Control; Treble Control; Phone Jack; Power Switch; Speaker Switch. Rear panel: Fuse, AC Power Socket; Switched & Unswitched. Speaker Terminal Block: One Left & One Right Speaker. Ground Terminal: 1. Triple Phono Input Sockets. Power requirements: 105-125 volts, 50/60 Hz, 20 watts idling; 60 watts full output; (No load on AC power socket). Dimensions: With walnut cabinet 12 $\frac{1}{2}$ " W x 3 $\frac{1}{2}$ " H x 9 $\frac{3}{4}$ " D. Custom mounting dimensions: Horizontal or vertical; cutout required 11 $\frac{3}{4}$ " x 2 $\frac{7}{8}$ "; depth required from front of mounting surface 10 $\frac{3}{4}$ ".



AJ-14
\$49⁹⁵

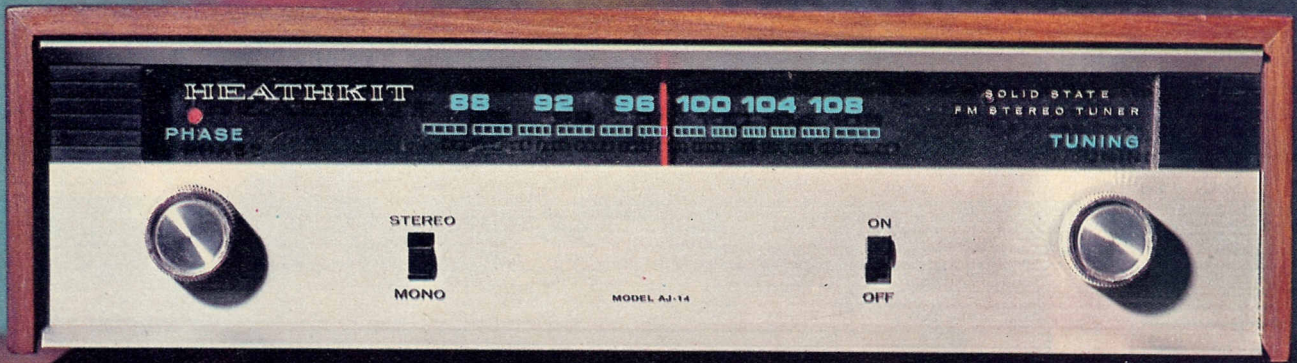
(less cabinet)

A Word About The AJ-14 Tuner From Owner John K. Cryer, Little Rock, Arkansas

"Why don't you tell people the truth about your Model AJ-14 FM Stereo Tuner? The quick construction time, fabulous performance and low price have left me at a loss of words to describe my satisfaction."

AJ-14 Owner, Mr. Merlin Bailey, Indianapolis, Indiana writes:

"I find there are many more FM stations around than I thought there were, and am very much surprised and pleased with the performance of this little jewel of a tuner."



AA-14
\$59⁹⁵

(less cabinet)



AA-14 Owner, Mr. Dave Morris, Ft. Collins, Colo. writes:

"I have but one word concerning your Heathkit Amplifier model AA-14; WOW! I couldn't believe \$59.95 could buy so much good listening. I have my amplifier hooked to a Garrard AT-60 turntable and two Rek-O-Kut speakers, and I must confess it sounds just as good as my roommate's \$350 receiver."

"P.S. I have been given estimates of \$150 on the worth of the AA-14."

More Praise For The AA-14! Mr. Irving Christenson, New York, N. Y. Writes:

"My son assembled the kit in about 14 hours. No problems. It worked right away and sounded great! Tried it with my vast assortment of speaker systems, Altec, Tannoy, Wharfedale and Bozak. It even drove the big Bozak system (2 woofers, etc.)."

"The AA-14 is a compact, handsome, reasonably lightweight unit with all the necessary features."

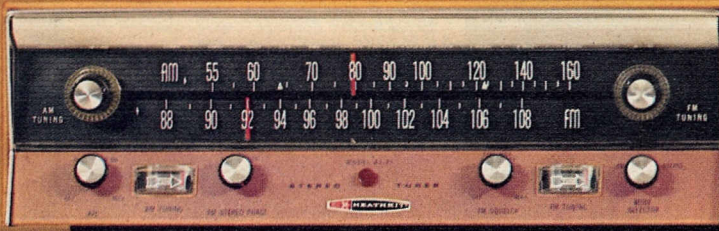


STEREO HI-FI

Heathkit® "Tube-Type" Stereo/Hi-Fi...

AJ-41
\$112⁵⁰

AA-100
\$84⁹⁵



Deluxe AM/FM/FM Stereo Tuner . . . Complete Listening At Your Command

- Built-in FM multiplex adapter • Automatic FM Stereo indicator light • Adjustable Automatic Frequency Control for drift-free reception • Stereo phase control for maximum separation and lowest distortion • Adjustable FM squelch • Individual AM and FM tuning meters • Preassembled tuning unit, prealigned coils • Easy to build with 3 simple circuit boards

Take A Spin Across The Dial . . . enjoy maximum fidelity AM with its news, music and sports . . . the quiet beauty of FM with its vast selection of good musical listening . . . or the "concert-hall" realism of the ever-increasing number of FM stereo broadcasts. It's all yours on the AJ-41.

A Host Of Deluxe Features! Like the automatic stereo indicator that lights whenever stereo is broadcast; the built-in stereo adapter; adjustable automatic frequency control for drift-free reception; adjustable phase control for maximum stereo separation; individual tuning meters for AM and FM; FM squelch control to quiet between-station noise while tuning; cathode follower outputs to minimize hum and high frequency losses; and output stages that "tie" together so you can listen from both channels when AM or FM mono is played.

For Added Convenience, there's effortless flywheel tuning; a lighted slide-rule dial; fidelity switch for normal or maximum AM fidelity; built-in antennas; and external antenna connectors.

Styling Adds A Touch Of Modern Elegance to any room . . . luggage tan vinyl-clad steel cabinet with polished trim and charcoal front panel . . . matches the AA-100 opposite.

Kit AJ-41, 26 lbs. . . no money down, \$11 mo. **\$112.50**

AJ-41 SPECIFICATIONS—FM: Tuning range: 88 MHz to 108 MHz. I.F. frequency: 10.7 MHz. Frequency response: ± 2 db, 20 to 20,000 Hz. Antenna: 300 ohm balanced (for internal or local reception). Output voltage: Nominal .5 volts (with 3 uv 30% modulation in). Quieting sensitivity: 2 uv for 20 db of quieting, 20 uv for full quieting (40 db). Maximum deviation sensitivity: 5 uv; (400 cycle 100% modulation). Deviation sensitivity: 20 kHz (1100 uv in). Harmonic distortion: Less than 1% (1100 uv 400 cycle 100% modulation). Image ratio: 40 db. AFC correction factor: 12 db. Amplitude modulation suppression: 25 db. Hum & noise: 40 db below 30% modulation (20 uv in).
SPECIFICATIONS MULTIPLEX—Audio frequency response: ± 2 db, 50 to 15,000 Hz. Sub-carrier bandpass: ± 3 db 23,000 to 53,000 Hz. Channel separation: 30 db. Hum & noise: -55 db (relative to 1 volt rms output). Output impedance: Cathode follower, variable to 4,000 ohms (each channel).
SPECIFICATIONS AM—Sensitivity, narrow bandwidth position: 1400 kHz 3 uv; 1000 kHz, 4 uv; 600 kHz, 8 uv (standard IRE dummy antenna, .1 volt RMS reference output). Sensitivity change, narrow to broad position: -5 db. I.F. bandwidth, narrow: 14 kHz 6 db down. Broad: 20 kHz, 6 db down. Image ratio: 1400 kHz 50 db; 600 kHz 75 db. Harmonic distortion: Less than 1%. Hum & noise: 35 db below 30% modulation (1000 kHz unmodulated with 100 uv in). I.F. rejection ratio: 1400 kHz 42 db; 600 kHz 38 db. Power supply: Transformer operated, 117 v., 50-60 Hertz, 100 watts. Dimensions: 5 1/4" H x 15 1/2" W x 14 1/4" D.

Fingertip Convenience . . . 60 Watts Of Power . . . Matching Deluxe Stereo Amplifier

- IHF rated at 60 watts (50 watts continuous) • 5 stereo inputs • Versatile controls • Mixed channel center speaker output • Separate monophonic phono input • Easy circuit board assembly • Matches the AJ-41 tuner in styling and performance

What Do Owners Think About The AA-100? Mr. Alfred J. Mancinelli, Bronx, N.Y.: "The quality of the amplifier greatly exceeded my wildest dreams. It is truly unbelievable. I never expected that such realism could be attained." Mr. David Cannon, Waco, Texas: "The construction of the unit was greatly facilitated by easy-to-understand, step-by-step instructions and descriptive diagrams. But the thing that really sold me on Heathkit is performance. It is really excellent."

Now Compare The Deluxe Features! Produces 50 watts continuous, 60 watts music power from 30 to 15,000 Hz at ± 1 db. 5 stereo inputs handle any source . . . stereo mag. phono, AM and FM tuners, tape recorder, plus two pairs for auxiliary sources. Also has outputs for 4, 8 and 16 ohm speakers, plus a mixed-channel output for stereo "fill-in" or monophonic sound to other rooms. Cathode follower outputs minimize hum and high frequency losses, and the tape playback heads can be connected directly without external amplification or equalization.

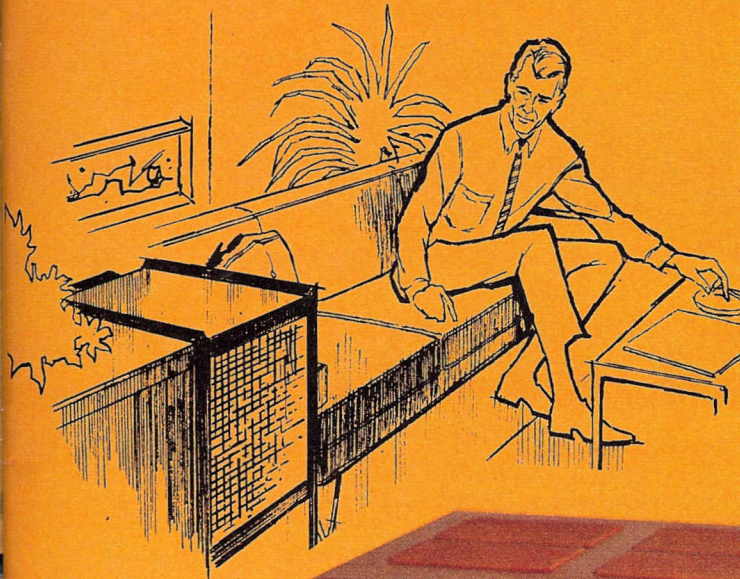
Fingertip Controls. Includes controls for preamplifier input level; power amplifier input level; hum; mode selector; speaker phase reversal switch; balance and separation; ganged volume; and separate concentric bass and treble tone.

Handsome Designer Styling. Luggage tan vinyl-clad steel cabinet with polished aluminum trim and soft refracted lighting matches the AJ-41 Tuner (opposite) . . . blends with any decor.

Kit AA-100, 34 lbs., no money dn., \$9 mo. **\$84.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AA-100 SPECIFICATIONS—Recommended System Mates: Separate Speakers, AS-183, pg. 40; Speaker Systems, AS-10, AS-51, pg. 37 & 38; all changers & turntables, ppg. 31, 32 & 33; Tuner, AJ-41 opposite. Channels: 2. Power output: 50 watts (25 w. per channel) Heath Hi-Fi Rating: 60 watts (30 w. per channel) IHF Music Power Output (0.7% THD, 1 kHz). Power response: ± 1 db from 30 Hz to 15 kHz at 25 watts output per channel. Harmonic distortion: Less than 0.5%, at 25 watts, 1 kHz. Less than 2% at 25 watts, 30-15,000 Hz (each channel). Intermodulation distortion: Less than 1% at 25 watts, 60 and 6,000 Hz signals mixed 4:1 (each channel). Hum and noise: Mag phono, 55 db below 25 watts output at 6 mv sensitivity. Tape Head, 35 db below 25 watts output. Tuner and aux. inputs 70 db below 25 watts output. Channel separation: 42 db min. at 1 kHz. Input sensitivity: For 25 watts output per channel; mono mag. phono, 1.5 mv; stereo mag. phono, 1.5 mv; tape head, 1 mv; tuner, 0.2v.; aux. 1 & 2, 0.2v. Outputs: 4, 8 and 16 ohms; cathode follower tape recorder outputs. Dimensions: 5" H x 15 1/4" W x 13 1/2" D. (allow 1" for cables at rear)

The Choice of Audiophiles The World Over



AJ-32
\$84⁹⁵

AA-151
\$59⁹⁵



Recognized For Great Performance And Dollar-Stretching Value . . . 32-Watt Stereo Amplifier

- Two hi-fi rated 14-watt (16-watt IHF) channels • Separate preamplifiers and power amplifiers • Patented Heath ULTRA-LINEAR® circuit for unusually fine specifications • 4 stereo inputs . . . mag. & ceramic phonos, tuner, auxiliary • Matches AJ-32 tuner (opposite) in styling & performance • Easy to build . . . easy to buy

Just Connect Your Favorite Source To The AA-151, relax and listen. Offers four stereo inputs to handle magnetic and crystal phono, AM or FM stereo tuners, or high level auxiliary sources like a tape recorder or TV. Furnishes 28 watts continuous, 32 watts IHF music power from 30 to 22,000 Hz at ± 1 db.

Complete Fingertip Controls. A 6-position mode switch for independent or combined choice of either channel. A dual-concentric volume control provides individual and separate ganged bass and treble controls provide simultaneous channel adjustments. A filament balance control effectively cancels filament hum. A reversal switch changes speaker phase for correct output. And two AC outlets (switched and unswitched) on the back . . . handy for phonograph, tuner or other accessory power.

Attractive Eye-Appealing Styling. Clean and uncluttered . . . just like its performance. Tan vinyl-clad steel cabinet with charcoal gray front panel and anodized aluminum trim. Matches the AJ-32 tuner (opposite)

Kit AA-151, 30 lbs. . . no money down, \$6 mo. \$59.95
Export model available for 115-230 v. AC, 50-60 Hz; write for prices.

AA-151 SPECIFICATIONS—Recommended System Mates: Separate Speakers, AS-163, pg. 40; Speaker Systems, AS-51, pg. 38; AS-10, pg. 37; all changers & turntables, ppg. 31, 32 & 33; Tuner, AJ-32 above. **Channels:** 2. **Power output:** 28 watts (14 w. per channel) Heath Hi-Fi Rating: 32 watts (16 w. per channel) IHF Music Power Output (0.7% THD, 1 kHz). **Power response:** ± 1 db from 20 Hz to 20 kHz at 14 watts output per channel. **Harmonic distortion:** Less than 2%, 30 Hz to 15 kHz at 14 watts output per channel. **Intermodulation distortion:** Less than 2% at 14 watts output per channel using 60 Hz and 6 kHz signal mixed 4:1. **Hum and noise:** Mag. phono input, 55 db below 14 watts; Tuner and crystal phono 65 db below 14 watts. **Channel separation:** Better than 45 db. **Input sensitivity:** For 14 watt output each channel (tone controls in "Flat" position); mag phono, 0.004 volts at 1 kHz crystal phono, 0.2 volts; tuner and aux., 0.2 volts. **Outputs:** 4, 8 and 16 ohms. **Dimensions:** 15 1/4" W x 5 1/4" H x 11" D.

What's Your Listening Pleasure . . .

AM, FM, FM Stereo?

This Heathkit Tuner Offers Them All At Low Cost

- Built-in multiplex converter • FM Stereo indicator light • Variable AFC for drift-free reception • 2 bar-type "Eye" tuning indicators • Stereo Phase control • Filtered stereo outputs • Styling matches AA-151 amplifier (opposite)

Front-Panel Controls For Complete Operating Convenience. Like the Phase control for maximum stereo with minimum distortion . . . the variable Automatic Frequency Control that captures stations for crisp, drift-free reception . . . individual bar-type "eye" tuning indicators for both AM and FM . . . an AM fidelity switch for maximum selectivity or fidelity . . . level controls to adjust to the input needs of your amplifier . . . and effortless flywheel tuning. There's also a stereo indicator that lights automatically when stereo is received . . . the outputs are specially filtered for taping stereo favorites without beatnote interference . . . built-in AM and FM antennas, plus separate terminals for outside antennas . . . cathode follower outputs to minimize hum and high frequency losses . . . and a squelch circuit to eliminate between-station noise when tuning.

Assembly Is Fast, Fun, Easy! The "front-end" tuner is preassembled and aligned to get you off to a quick start. And the simple step-by-step instructions and "exploded" diagrams easily guide you the rest of the way. Includes handsome tan vinyl-clad steel cabinet with charcoal front panel and polished trim. Mate it with the matching AA-151 amplifier for a praise-winning pair!

Kit AJ-32, 23 lbs. . . No money down, \$9 mo. \$84.95

AJ-32 SPECIFICATIONS—AM Section: Tuning range: 550 kHz-1600 kHz. Usable sensitivity (normal position): 1400 kHz—10 microvolts (20 db of quieting); 1000 kHz—15 microvolts (20 db of quieting); 600 kHz—40 microvolts (20 db of quieting). **Output voltage** (750 microvolts—30% mod.): 1 volt. **Harmonic distortion:** (750 microvolts—95% mod.): Less than 1%. **Hum and noise:** (5000 microvolts, 30% mod.): 30 db. **FM Section:** Tuning range: 88 MHz-108 MHz. **Antenna:** Balanced input for external 300 ohm antenna. Internal line antenna. **Output voltage** (30 microvolts—30% mod.): 1 volt. **Harmonic distortion** (25 microvolts—100% mod.—98 MHz): Less than 1%. **IF rejection** (98 mc): —65 db. **FM audio response** (20-20,000 Hz): ± 1 db. **AM suppression:** —27 db. **Hum and noise** (25 microvolts, 30% mod.): —48 db. **Quieting sensitivity:** 20 db—2 1/2 microvolts; 30 db—3 1/2 microvolts; 48 db—30 microvolts (max. quieting). **FM Stereo Converter Section:** **Audio frequency response:** ± 2 db from 50 to 15,000 Hz. **Subcarrier bandpass:** ± 3 db from 23,000 to 53,000 Hz. **Channel separation:** 30 db or more at 1 kHz; 25 db or more at 10 kHz. **Hum and noise:** —55 db relative to 1 volt rms output. **Output impedance** (cathode follower): Variable to 4000 ohm, each channel. **Size:** 5 1/4" H x 15 1/4" W x 11" D.

Heath Offers You Incomparable "Extra" Customer Service

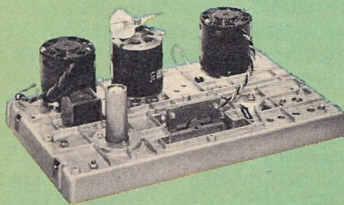
The World's Most Deluxe Tape Recorder Kit...

The New Heathkit®/Magnecord 1020

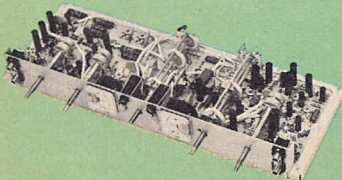


AD-16
\$399⁵⁰
 (less cabinet)

Compare These Professional Features



3 Separate Motors . . . a hysteresis synchronous capstan motor for constant speed, and two permanent split-capacitor types to drive the reels. Brake, tape gate and pinch roller are solenoid-operated for positive action. Everything mounts to a heavy die-cast top-plate.



All Solid-State Circuitry . . . 21 transistors, 4 diodes—your assurance of cool, instant operation and long trouble-free life. Just two circuit boards to wire, and some easy mechanical mounting for the transport components . . . finish in around 25 hours.

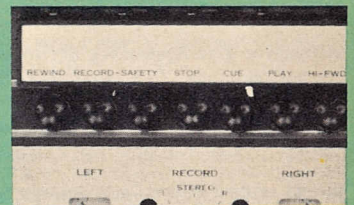


3 Professional Tape Heads . . . engineered and lapped to a precise hyperbolic curve . . . 4-track stereo or mono record and playback—sound-on-sound record—sound-with-sound record—echo effects.

2 V. U. Meters . . . for visual monitoring of signal levels from either tape or source . . . allows quick comparison of source with recorded signal.



Push-Button Operating Convenience . . . features push-button controls for fast, simple operation of all functions . . . power On-Off, Stop, Rewind, Record, Safety, Cue, Play and Hi-Fwd. The 7 function selector push-buttons interlock mechanically to prevent the wrong button from being pushed in the wrong sequence thus avoiding accidental erase, tape breakage and spillage.



Complete Inputs and Outputs . . . jacks for monitor output and tape output, and auxiliary inputs (for tuners, TV's, etc.) are located on the rear chassis panel. Inputs for microphones and outputs for headphones are conveniently located on the front panel for easy access.



Save Over \$170 By Building The Heathkit® Version Of This Professional 4-Track Stereo Tape Recorder

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

Thanks to Heath, you can now save over \$170 on the new Magnecord 1020 4-Track Transistor Stereo Tape Recorder by building it yourself. And the only difference between this Heathkit version and the original is the \$170 you save (think of all the tape you can buy with that!). All parts are made at the Magnecord factory.

Add to this Magnecord's years of pioneering and developing tape equipment for the broadcasting and recording industries, and you have a sophisticated recorder that will give you years of professional quality and reliability.

VERSATILE, PROFESSIONAL RECORDING. With the AD-16 you can record "live" from microphones, or from auxiliary sources like tuners, TV's, etc., and playback . . . in 4-track stereo or mono at either 7½ or 3¾ ips. And you can make sound-on-sound, or sound-with-sound (mixing) recordings, or create interesting echo effects.

PROFESSIONAL TAPE TRANSPORT. The tape transport is powered by 3 separate motors. The hysteresis synchronous capstan motor has a dynamically balanced flywheel and a ballbearing inertial stabilizer for constant, accurate speed. Two permanent split-capacitor torque motors drive the supply and takeup reels. With the convenient push-button controls, you can change operational modes instantly and gently with the touch of a button. Compliance arms insure correct tape tension at all times.

The military-type differential band brakes are solenoid operated for instant, gentle stops. And when the tape runs out an automatic switch shuts off all motors, opens the tape gate and retracts the pinch roller by automatic solenoid-operation for positive action.

3 PROFESSIONAL TAPE HEADS. Selectable ¼ track erase, record and play. Engineered and lapped to a precise hyperbolic curve for smooth low frequency response . . . made with a deep gap, deposited quartz for

high frequency response and long life. Removable shields afford double protection against external magnetic fields. Protective, snap-mounted head covers provide easy access for cleaning and de-magnetizing.

OTHER PROFESSIONAL FEATURES. All parts mount on a heavy, die-cast top-plate that won't warp, reduces wear, provides rigid support and stable alignment. Two V.U. meters for visual monitoring of signal levels from either tape or source . . . allows quick comparison of source with recorded signal. Inputs for microphones and outputs for headphones are all front-panel mounted for easy access. Digital counter with push button zero reset. Low impedance emitter-follower outputs deliver 1 volt or more to your external stereo amplifier inputs. Individual gain controls for each channel. And all solid-state circuitry . . . 21 transistors and 4 diodes . . . your assurance of cool, instant operation, long reliable life.

FAMOUS HEATHKIT KNOW-HOW SPEEDS ASSEMBLY. Simple step-by-step instructions with generous use of giant pictorials guide you every step of the way. You just wire two circuit boards and do the easy mechanical mounting of the transport components.

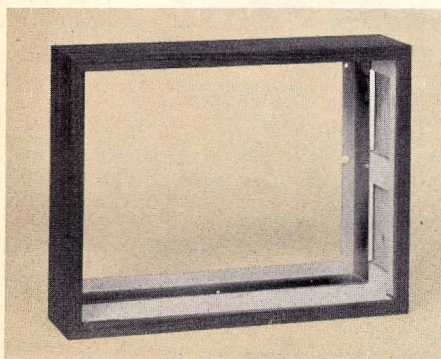
And to make construction even easier, the connecting wires and shielded cables are pre-cut, pre-stripped, and marked . . . even the connectors are installed where necessary; just plug them in! Total assembly time is around 25 hours . . . that's like getting paid \$7 an hour for your efforts.

VERSATILE INSTALLATION. Operates in either vertical or horizontal positions. Mount in a wall, cabinet, tape drawer, or place on a shelf with the optional walnut base. Optional slides and walnut base combine as a tape drawer for sideways mounting in Heath AE-20W or AE-13S equipment cabinets (p. 42) with back panel removed or cut out.

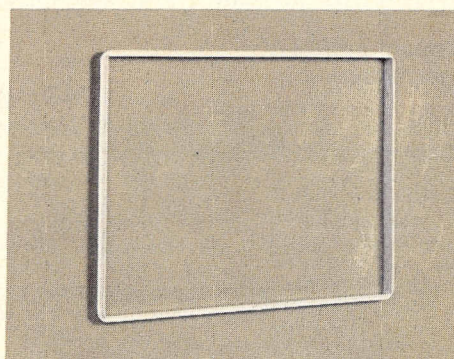
Get today's best buy in a professional stereo tape recorder . . . order the Heath's exclusive kit version of the Magnecord 1020 now!

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

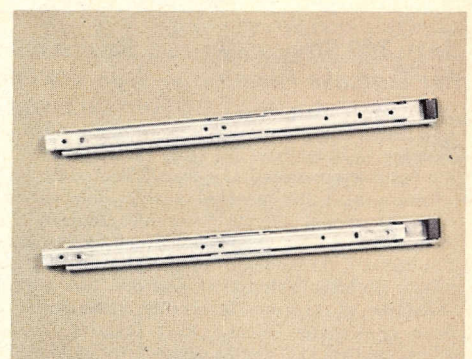
AD-16 SPECIFICATIONS—Tape speeds: 7½ ips and 3¾ ips. **Speed accuracy:** ±1% at 7½ ips; ±2% at 3¾ ips. **Wow and flutter:** 0.18% rms at 7½ ips; 0.25% at 3¾ ips. **Tape size:** ¼" wide; 1.5, 1.0, 0.75 or 0.5 mil thick. **Reel size:** Standard N.A.B. 5", 7" reels, and 8¼" Magnecord reel. **Rewind and hi-fwd time:** 1200 ft. in 120 seconds or less. **Digital counter:** 3-digit counter with zero reset. **Heads:** ¼ track erase, record and playback. **Circuitry:** 21 transistors, 4 diodes. **Frequency response:** ±3 db, 30 to 10,000 Hz at 3.75 ips; ±2 db, 45 to 18,000 Hz at 7.5 ips. **Signal-to-noise ratio:** 48 db at 3.75 ips; 52 db at 7.5 ips. **Inputs per channel:** Hi-Z microphone, auxiliary. **Outputs:** Emitter follower, output level at 0 VU .9 V ±.2V at 400 Hz. **Power supplies:** Transformer-operated, full-wave rectifier, series regulated—17 volt DC supply. Half-wave rectifier solenoid power supply. **Dimensions:** Overall, without base, 17⅞" W x 13-5/64" D x 8¼" H (minimum space required for cabinet mounting, 15-15/64" H x 18¼" W x 8¼" D). **Power requirements:** 110-130 volts, AC, 60 Hz, 140 watts.



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



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



OPTIONAL TAPE DRAWER SLIDES . . . combine with ADA-16-1 walnut base (opposite) for a handy tape drawer when mounting AD-16 in equipment cabinets. Mounts sideways in Heath AE-20W or AE-13S cabinets with back panel removed or cut out.
ADA-16-3, 6 lbs. \$9.95



New Sony Tape Recorders

HOME ENTERTAINMENT

SONY **SUPERSCOPE**

NEW!

GDP-26

\$229⁵⁰



New Sony Solid-State Sterecorder "260" . . . Complete 4-Track Stereo & Mono Record And Playback System

A HOST OF PROFESSIONAL RECORDING FEATURES. 4-Track Stereo and Mono Record and playback at 7½ and 3¾ ips. XL-2 Radial Sound—each side of carrying case contains an acoustically isolated infinite baffle enclosure. A special 4" x 8" high compliance elliptical speaker is mounted in each enclosure, and positioned so the sound radiates in an arc . . . provides same stereo separation achieved from conventional wide-spaced speakers. **Solid-State Circuitry** . . . transistorized power amplifiers with 10 watts of music power per channel. **FM Stereo Inputs** . . . for recording FM stereo "off the air." **2 Professional VU Meters** . . . for accurate level indications. **Dynamically Balanced Capstan Flywheel** . . . advanced "rim drive" eliminates belts, assures smooth operation. Other features include separate bass and treble tone controls; automatic tape lifter heads; pause control and tape counter for editing, cueing and tape indexing; vertical or horizontal operation; automatic shut-off at end of reel; handsome dark gray and satin-chrome carrying case with two Sony F-96 dynamic microphones. Not a kit.

Model GDP-26, 45 lbs. . . no money dn., \$22 mo. \$229.50

GDP-26 SPECIFICATIONS—Tape speeds: 7½ and 3¾ ips. Frequency response: ±3 db, 50-15,000 Hz. **Flutter & wow:** Less than 0.19% @ 7½ ips; 0.25% @ 3¾ ips. **Signal to noise ratio:** Better than 50 db. **Inputs:** 2 low imp. microphones, 2 high level. **Outputs:** 2 line outputs, 2 external speakers. **Power requirements:** 117 volts, 60 Hertz, 55 watts. **Dimensions:** 21 5/8" W x 15 1/2" D x 7 3/4" H.

NEW!

GDP-36

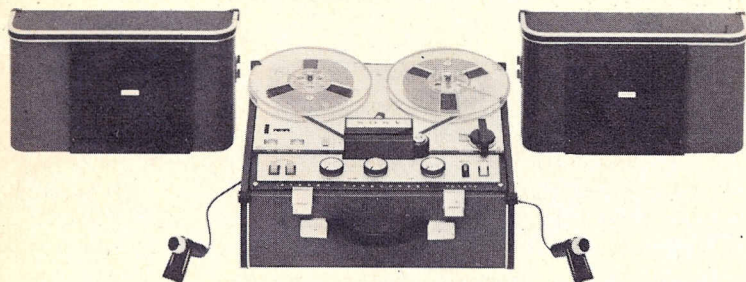
\$139⁵⁰



New Solid-State Sonymatic "105" . . . Portable Convenience . . . 4-Track Monophonic Recording And Playback

COMPARE ITS MANY EXCLUSIVE FEATURES. 4-track Monophonic Record and Playback at 3 speeds . . . 7½, 3¾ and 1 7/8 ips. **Full 7" Reel Capacity** . . . up to 8 hours of continuous record or playback. **10 Watts Music Power Output** . . . special switch for operating amplifier and built-in speaker as portable public address system. **Sonomatic Automatic Volume Control** . . . adjusts levels of voice recording. **AVC defeat switch** and **VU meter** provide complete dynamic range for music recording. **Sony RPR** . . . exclusive Retracting Pinch Roller provides an unobstructed tape path for easy threading. **Sound-On-Sound Recording** . . . ideal for language and music training. Built-in connections and switching provide immediate student/teacher track comparisons. Other features include pause control and digital counter for editing, cueing and tape indexing; tone control; automatic shut-off at end of reel; Sony F-96 dynamic mike. **Model GDP-36, 27 lbs.** . . no money dn., \$13 mo. \$139.50

GDP-36 SPECIFICATIONS—Tape speeds: 7½, 3¾ and 1 7/8 ips. Frequency response: 50-12,000 Hz @ 7½; 50-10,000 Hz @ 3¾ ips; 50-8,000 Hz @ 1 7/8 ips. **Flutter & wow:** 0.12% @ 7½ ips; 0.18% @ 3¾ ips; 0.2% @ 1 7/8 ips. **Signal to Noise Ratio:** 45 db or better. **Inputs:** Low impedance microphone and high impedance auxiliary. **Outputs:** Monitor and 8 ohm external speaker. **Power requirements:** 117 volts, 60 hertz, 45 watts. **Dimensions:** 14 3/4" W x 13 1/4" H x 7 1/4" D.



GDP-184B

\$179⁰⁰

Sony 200 Sterecorder . . . Detachable Speakers Form Lid For Suitcase Portability, Separate For Best Stereo

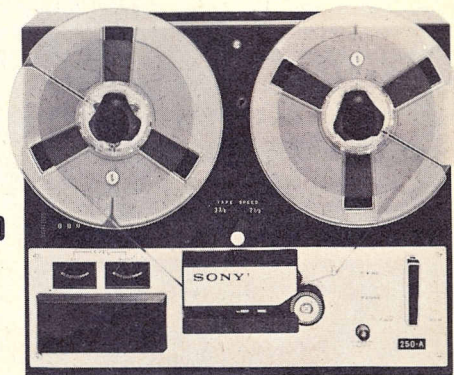
DESIGNED FOR HOME OR PORTABLE USE. Features 4-Track Stereo And Mono record and playback at 7½ and 3¾ ips. **Full Range 2-Speaker System** . . . combines to form carrying case lid, separates up to 15 ft. for best stereo. **Sound On Sound Recording** . . . individual push button selection of either channel enables inter-channel transfer for multiple track or special effects recording. **Built-in Stereo Preamps & Power Amplifiers** . . . can be used with external sound systems, or as complete P.A. system. **Dynamically Balanced Capstan Flywheel** . . . advanced "rim drive"—no belts to stretch or wear out. **Two VU Meters** . . . assures accurate indication of recording level. **FM Stereo Inputs** . . . record "off the air" from your stereo tuner. Other features include automatic tape lifter; pause control and digital counter for cueing, editing and indexing; full 7" reel capacity; two Sony F-96 mikes; dark gray and chrome case.

Model GDP-184B, 35 lbs. . . No money down, \$17 mo. \$179.00

GDP-184B SPECIFICATIONS—Power requirements: 70 watts, 117 volts, 60 Hz (50 Hz optional). **Tape speeds:** 7½ and 3¾ ips. **Frequency response:** 50-14,000 Hz @ 7½ ips; 50-10,000 Hz @ 3¾ ips. **Flutter & wow:** Less than 0.19% @ 7½ ips; less than 0.25% @ 3¾ ips. **Signal to noise ratio:** Better than 45 db. **Level indication:** 2 VU meters. **Input provision:** 2 microphone; 2 high level. **Output provisions:** Pre-amp. Two 600 ohm high level; Power amp. Two 8 ohm external speakers & stereo headsets. **Transistor & tube complement:** (2) 2SD64, (1) 6267, (3) 30A5, (3) diodes. **Dimensions:** 15" W x 16" D x 9" H.

GDP-174A

\$135⁰⁰



Sony Solid-State Sterecorder "250-A" . . . Operates Vertically Or Horizontally

ADVANCED FEATURES FOR COMPLETE OPERATING VERSATILITY. 4-Track Stereo And Mono record and playback at 7½ and 3¾ ips. **Solid-State Circuitry** . . . assures cool, instant operation. Includes recording amplifiers and playback preamplifiers. **FM Stereo Inputs** . . . for recording FM stereo "off the air." **Dynamically Balanced Capstan Flywheel** . . . advanced "rim drive"—eliminates belts, assures smooth operation. **Automatic Sentinel Shut-Off Switch** . . . sensing mechanism turns off power at end of reel. **Automatic Tape Lifter** . . . protects head from wear during fast forward and rewind. **Pause Control And Digital Tape Counter** . . . for precise editing, cueing and tape indexing. Other features include two VU meters for accurate level indications; single knob for simple control of all functions; full 7" reel capacity; vertical or horizontal position operation; and attractive walnut case-cabinet. **Model GDP-174A, 23 lbs.** . . No money down, \$13 mo. \$135.00

GDP-174A SPECIFICATIONS—Power requirements: 115 volts, 60 Hz (50 Hz optional). **Tape speeds:** 7½ and 3¾ ips. **Flutter & wow:** 0.19% @ 7½ ips; 0.25% @ 3¾ ips. **Frequency response:** 50-14,000 Hz @ 7½ ips. **Signal to noise ratio:** 50 db or more. **Level indication:** 2 VU meters. **Inputs:** Microphone and line per channel. **Outputs:** High level line per channel. **Dimensions:** 14 1/2" W x 6 1/2" D x 9" H.

Famous DUAL Turntables!



ADP-55
\$129⁵¹

(with 1c cartridge)



ADP-116
\$109⁵¹

(with 1c cartridge)



ADP-136
\$69⁵¹

(with 1c cartridge)

Deluxe Dual 1019 Auto/Professional Turntable

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

Model ADP-55, turntable only, 20 lbs. No money down, \$12 month. **\$129.50**
 Model ADP-55, turntable and choice of any 1c cartridge page 36 (specify by model number) 21 lbs.
 No money down, \$12 month. **\$129.51**
 ADA-24W, oiled solid walnut base, 3 lbs. **\$11.95**
 ADA-24-1, 45 rpm spindle, 2 lbs. **\$4.80**

ADP-55 SPECIFICATIONS: Speeds: 16 2/3, 33 1/3, 45 and 78 rpm. Variable over 6% range. Motor: High torque continuous pole induction. Tracking: Less than 0.2 gram variation from 1st to 10th record. Turntable: 7 1/2 lb. dynamically balanced. Color: Black/silver. Cables furnished: Line cord, 2 audio. Power requirements: 100-130 volts, 60 Hertz. Dimensions: Required mounting space; 11 3/4" x 12 3/4" x 6" above and 3" below motor board

New Dual 1009 SK Auto/Professional Turntable

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

ADP-116, changer only, 17 lbs. no money down, \$11 month. **\$109.50**
 ADP-116, changer & choice of any 1c offer cartridge below (specify by model no.) 17 lbs. no money dn. \$11 mo. **\$109.51**
 ADA-24W, oiled walnut base, 3 lbs. **\$11.95**
 ADA-24-1, 45 rpm spindle, 1 lb. **\$4.80**

ADP-116 SPECIFICATIONS:—Speeds: 16 2/3, 33 1/3, 45 and 78 rpm. Turntable speed: All 4 speeds accurate within 0.1% with one to ten records. Motor type: 4-pole induction shock and vibration shielded. Type of drive: Friction. Tracking force variations: Less than 0.2 grams from 1st to 10th record. Record capacity: Up to 10 records. Record sizes: 7", 10", 12". Control functions: Manual Speed Selector; Manual Record Size Selector; Stop/Start Manual/Automatic switch. Dimensions: 11 3/4" x 12 3/4" x 6" clearance above, 3" below. Power requirements: 117 VAC, 60 Hertz

New Dual 1010A Auto/Standard Turntable

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

ADP-136, changer only, 16 lbs. no money dn. \$7 mo. **\$69.50**
 ADP-136, changer & choice of any 1c offer cartridge below (specify by model no.) 16 lbs. no money dn., \$7 mo. **\$69.51**
 ADA-24W, oiled solid walnut base, 3 lbs. **\$11.95**
 ADA-24-1, 45 rpm spindle, 1 lb. **\$4.80**

ADP-136 SPECIFICATIONS:—Speeds: 16 2/3, 33 1/3, 45 and 78 rpm. Turntable speed: All 4 speeds accurate within 0.1% with one to ten records. Motor type: 4-pole induction, shock & vibration shielded. Type of drive: Friction. Tracking force variations: Less than 0.2 grams from 1st to 10th record. Record capacity: Up to 10 records. Record sizes: 7", 10", 12". Control functions: Manual Speed Selector; Manual Record Size Selector; Stop/Start Manual/Automatic switch. Dimensions: 11 3/4" x 12 3/4" x 6" clearance above, 3" below. Power requirements: 117 VAC, 60 Hertz

Choose Your Special Offer Cartridge — Limit One Per Changer Ordered.

Special Cartridge Offers With Changer Order—
Specify By Heath Model Number

Shure M55E 15° Dynetic Elliptical Stylus!

Elliptical diamond stylus and new 15° vertical tracking provide near perfect freedom from distortion, resulting in unmatched purity of sound. Low mass. Scratchproof. Will track at forces of 3/4 to 1 1/2 grams.

Model AD-95R, 1 lb. **\$35.50**
 Model AD-95R MANUFACTURER'S SPECIFICATIONS — Frequency response: 20 to 20,000 Hz. Output: 6.6 mv per channel @ 1 kHz. Separation: Over 25 db @ 1 kHz. Load Impedance: 47,000 ohms per channel. Stylus: Elliptical 0.7 mil diamond. Compliance: 25.0 x 10⁻⁶ cm/dyne. Tracking force: 3/4 to 1 1/2 grams.

Shure M44E 15° Magnetic Elliptical Stylus

AD-106G MANUFACTURER'S SPECIFICATIONS—Frequency response: 20-20,000 Hz. Output: 9.3 mv. Separation: More than 25 db at 1kHz. Load impedance: 47,000 ohms per channel. Stylus: Elliptical 0.7 mil diamond. Compliance: 15.0 x 10⁻⁶ cm/dyne. Tracking force: 1 3/4 to 4 grams.
 Model AD-106G, 1 lb. **\$34.50**

Empire 888E Magnetic

AD-96H MANUFACTURER'S SPECIFICATIONS — Frequency response: 10 to 30,000 Hz. Output: 8 mv per channel. Separation: 30 db. Load impedance: 47,000 ohms. Stylus: .4 x .9 mil elliptical diamond. Compliance: 12 x 10⁻⁶ cm/dyne. Tracking force: 3/4 to 6 grams. Vertical tracking angle: 15°.
 Model AD-96H, 1 lb. **\$34.95**

Pickering V15ATE-2 Magnetic

AD-26M MANUFACTURER'S SPECIFICATIONS — Frequency response: 10 to 25,000 Hz. Output: 6.9 mv. Separation: 35 db. Load impedance: 47,000 ohms. Stylus: elliptical diamond. Tracking force: 2 to 5 grams. Vertical tracking angle: 15°.
 Model AD-26M, 1 lb. **\$34.95**

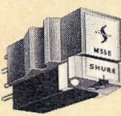
Pickering V15ATE-3

"Magnetic"—With Lint Brush
 AD-36M MANUFACTURER'S SPECIFICATIONS — Frequency response: 20 to 20,000 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-36M, 1 lb. with lint brush **\$39.95**



Shure M44-7 15 Dynetic

AD-85B MANUFACTURER'S SPECIFICATIONS — Frequency response: 20 to 20,000 Hz. Output: 11 mv per channel. Separation: More than 25 db at 1 kHz. Load impedance: 47,000 ohms per channel. Stylus: .018 mm diamond. Compliance: 20.0x10⁻⁶ cm per dyne. Tracking force: 1 1/2 to 3 grams.
 Model AD-85B, 1 lb. **\$19.95**



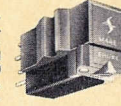
Empire 888 Magnetic

AD-125G MANUFACTURER'S SPECIFICATIONS — Frequency response: 12-25,000 Hz. Output: 8 mv/channel. Separation: 30 db. Load Impedance: 47,000 ohms. Stylus: 0.7 mil diamond. Compliance: 10 x 10⁻⁶ cm/dyne. Tracking Force: 3/4 to 6 grams. Tracking Angle: 15°.
 Model AD-125G, 1 lb. **\$19.95**



Pickering V15AT-2 "Magnetic"

AD-105J MANUFACTURER'S SPECIFICATIONS — Frequency response: 20 to 20,000 Hz. Output: 6.9 mv per cm/sec of recorded level. Load resistance: 47,000 ohms. Stylus: 0.7 mil diamond. Tracking force: 1 to 4 grams. Vertical tracking angle: 15°.
 Model AD-105J, 1 lb. **\$19.95**



CHANGER MODEL	Choose One For 1c More With Purchase of Models Shown	Or Choose One For \$5 More	Or Choose One For \$10 More
Garrard: 80 MK II	Pickering V15AT-2	Empire 888E ShureM55E	Pickering V15ATE-3
70 MK II	Shure M44-7		
60 MK II	Empire 888		
Dual: 1019	Pickering V15ATE-2		
1009SK	Shure M44E		
Garrard: 50 MK II	Pickering V15AT-2	Shure M44E Pickering V15ATE-2	
Dual: 1010A	Shure M44-7 Empire 888		

Shop The Easy Heathkit Way—Select Your Kits In The Comfort Of Your Home, Mail Your Order, & Get Direct-To-Your-Door Delivery

New 1967 Garrard Turntables... Many Advanced

New 40 Mk II Stereo Automatic Turntable . . . Advanced Features And Styling At Modest Cost



ADP-46 **\$44⁵¹**
(with 1c cartridge)

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

COMPACT IN SIZE AND PRICE . . . KING-SIZE IN PERFORMANCE. That's the new Garrard 40 Mk II with the same fine features as its predecessor, the Model 50 . . . like the counterbalanced cast aluminum tone arm with sensitive Delrin trip mechanism to offset friction, and track high compliance cartridges at minimal tracking force . . . 4-pole shaded "Induction Surge" motor with a dynamically balanced rotor for constant speed without hum or vibration . . . oversize turntable with an attractive mat . . . simple "finger-touch" stylus adjustment . . . and stereo-wired Amplok plug. New ebony and walnut cabinet with silver trim optional. See pg. 31 for cartridge offers with changer order.

ADP-46, turntable, 13 lbs. . . no money dn., \$5 mo. **\$44.50**
ADP-46, turntable with choice of 1c offer cartridge, pg. 31 (specify by model no. 14 lbs. . . . no money dn., \$5 mo. **\$44.51**
ADA-66-2, Garrard LRS20 45 rpm spindle, 1 lb. **\$5.95**
ADA-66-1, matching walnut base, 3 lbs. **\$4.50**

ADP-46 SPECIFICATIONS—Speeds: 16 $\frac{2}{3}$, 33 $\frac{1}{3}$, 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:** 14 $\frac{1}{4}$ " W x 12 $\frac{1}{2}$ " D x 4 $\frac{3}{8}$ " above and 2 $\frac{7}{8}$ " below top of motor board.

New 50 Mk II Automatic Stereo Turntable . . . With Manual Cueing And Pause Device Found

Only In Units Costing 2 or 3 Times As Much

- Automatically or manually plays all four speeds • Manual cueing and pause device • Automatically intermixes records of different size • 4-pole shaded "Induction-Surge" motor, with dynamically balanced rotor, shielded from hum • Large diecast turntable with decorative mat • Newly designed plug-in shell • Super-sensitive trip with DuPont Delrin® • New stylus pressure adjustor with gram markings • Newly designed control center • Lightweight tubular arm with resiliently mounted non-adjustable counterweight • Completely assembled

NEW FEATURES FOR IMPROVED RECORD PERFORMANCE. Thanks to a manual cueing and pause device on this all-new Garrard 50 Mk II, you can place the tubular tone arm on a record in any position. And since it can be activated any time while playing a stack of records, it also acts as a pause mechanism. Simply lift the special cueing lever, and the arm stays above the record as long as desired. When lowered, it resumes right where it left off, and the entire playing cycle continues.

The newly styled ebony and walnut base with silver trim is optional. See pg. 31 for special cartridge offers with changer order.

ADP-56, turntable, 14 lbs. . . . no money dn., \$5 mo. **\$54.50**
ADP-56, turntable with choice of 1c offer cartridge, pg. 31 (specify by model no.) 15 lbs. . . . no money dn., \$5 mo. **\$54.51**
ADA-66-2, Garrard LRS20 45 rpm spindle, 3 lbs. **\$5.95**
ADA-66-1, matching walnut base, 1 lb. **\$4.50**

ADP-56 SPECIFICATIONS—Speeds: 16 $\frac{2}{3}$, 33 $\frac{1}{3}$, 45 & 78 rpm. **Motor:** 4-pole shaded "Induction-Surge," shielded from hum. **Tracking:** Will track all high compliance cartridges. **Wiring:** 4-pin/5 wire system w/separate ground connection for hum elimination. **Color:** Iridescent charcoal gray. **Cables furnished:** Line cord and 2 audio. **Power requirements:** 100-130 volts, 60 hertz AC.



ADP-56
\$54⁵¹
(with 1c cartridge)

New 60 Mk II 4-Speed Automatic Stereo Turntable . . . New Features For Advanced Performance



ADP-66
\$74⁵¹
(with 1c cartridge)

- 4 speed automatic or manual play • New resiliently mounted counterweight to reduce rumble and resonance • New stylus pressure adjustment for smooth, accurate tracking force settings • Manual cueing and pause device • Tubular dynamically-balanced counterweight adjusted tone arm • Double-shielded Laboratory Series® 4-pole shaded motor • Super-sensitive DuPont Delrin® trip mechanism • Automatically intermixes records of different size • Heavy, cast oversized turntable, with mat • Completely assembled

FEATURES ADVANCES FOUND ONLY ON MORE EXPENSIVE UNITS!

Like the heavy cast oversized turntable; new stylus pressure adjustment with a knurled camera-type dial for precision, easy setting of tracking force; new resiliently mounted counterweight to further reduce the already minimal rumble and resonance; needle pivots for arm bearings; lightweight cut-away cartridge shell and finger lift; positive-acting tone arm safety catch; and a special manual cueing and pause device. New ebony and walnut base with silver trim optional. See pg. 31 for special cartridge offers with changer order.

ADP-66, turntable, 15 lbs. . . . no money dn., \$7 mo. **\$74.50**
ADP-66, turntable with choice of 1c offer cartridge, pg. 31 (specify by model no.) 16 lbs. no money dn., \$7 mo. **\$74.51**
ADA-66-2, 4 lbs. . . . Garrard LRS20 45 rpm spindle **\$5.95**
ADA-66-1, 1 lb. . . . matching walnut base. **\$4.50**

ADP-66 SPECIFICATIONS—Speeds: 16 $\frac{2}{3}$, 33 $\frac{1}{3}$, 45 & 78 rpm. **Motor:** 4-pole shaded, double-shielded. **Tracking:** Will track all cartridges, including high compliance models. **Color:** Special iridescent charcoal gray. **Wiring:** Stereo, 4-pin/5-wire system w/separate ground connection for hum elimination. **Cables furnished:** Line cord, 2 audio cables. **Power requirements:** 100-130 volts, 60 hertz AC. **Dimensions:** Requires mounting space 15 $\frac{3}{8}$ " W x 13 $\frac{3}{8}$ " D x $\frac{7}{8}$ " above and 2 $\frac{7}{8}$ " below top of motor board.

Performance Features, New Decorator Bases!

New 70 Mk II Automatic Stereo Turntable . . . With Garrard's Famous Pusher-Platform For The Safest Automatic Play Ever



ADP-76
\$84⁵¹
 (with 1c cartridge)

Adjustable Stylus Pressure And Tracking Force . . . accomplished in two simple steps.

Adjustable Bias Compensator Anti-Skating Device . . . the arm will track accurately without distortion.

Exclusive Pusher Platform . . . for the safest, most gentle automatic record changing ever.

- 4-Speed automatic or manual play
- Dynamically balanced tone arm for improved tracking capability and resistance to external shock
- Adjustable stylus pressure and tracking force
- Full size heavy-balanced cast "sandwich" turntable
- Adjustable bias compensator
- Double-shielded Laboratory Series® 4-pole shaded motor
- Exclusive pusher platform for automatic play
- Completely assembled

LUXURIOUS STYLING, SUPERB PERFORMANCE! Like its predecessor, the Type A70, the 70 Mk II offers a host of superlative features to handle modern high compliance cartridges, plus a beautiful iridescent charcoal gray color styling that will enhance any stereo system. A special dynamically balanced tone arm with an adjustable counterbalanced weight assures accurate tracking and resists external jarring. There are audible/visual 1/4 gram click settings on the stylus pressure gauge that's built into the tone arm. And special needle pivots set into miniature ball bearings make vertical motion on the tone arm virtually frictionless.

Also has a foam rubber spring cushion and stereo-wired Amplok plug. New ebony and walnut base optional. See pg. 31 for special cartridge offers with changer order.

- ADP-76, 23 lbs., turntable . . . no money dn., \$9 mo. **\$84.50**
- ADP-76, 24 lbs., turntable and choice of any 1c cartridge, page 31 (specify by model no.) . . . no money dn., \$9 mo. **\$84.51**
- ADA-76-1, 4 lbs., matching walnut base **\$5.50**
- ADA-76-2, 1 lb. . . . Garrard LRS3 45 rpm spindle **\$5.95**

ADP-76 SPECIFICATIONS—Speeds: 16²/₃, 33¹/₃, 45 & 78 rpm. **Motor:** 4-pole shaded, double shielded. **Tracking:** Will track with "professional" model cartridges. **Color:** Iridescent charcoal gray and chrome. **Wiring:** Stereo, 4-pin/5-wire system w/separate ground connection for hum elimination. **Cables furnished:** Line cord and 2 audio. **Power requirements:** 100-130 volts, 60 Hz AC. **Dimensions:** Requires mounting space 16" W., 13¹/₄" D., 6" above and 2¹/₄" below top of motor board.

Garrard's Finest . . . The New Lab 80 Mk II Automatic Transcription Stereo Turntable . . . Professional Reproduction Without Compromise



ADP-86
\$99⁵¹
 (with 1c cartridge)

New Turntable Mat . . . with deep rings at the 12", 10" and 7" positions.

New Anti-Skating Compensator . . . with accurate 1/2 gram increment markings.

Now The Ability To Repeat Records as desired through use of special adaptor.

- Insures professional performance of 33¹/₃ and 45 rpm records
- Heavy, cast turntable and special mat with deep rings at the 12", 10", and 7" positions
- New provision for automatic play of single record
- Hydraulically controlled integrated cueing device
- New anti-skating compensator with 1/2 gram marking and counterweight with a window for easy setting
- Repeats records as often as desired
- Dynamically balanced "Afrormosia wood" tone arm
- Laboratory Series® 4-pole shade motor
- Motor isolation system
- Delrin® trip mechanism with magnetic repulsion

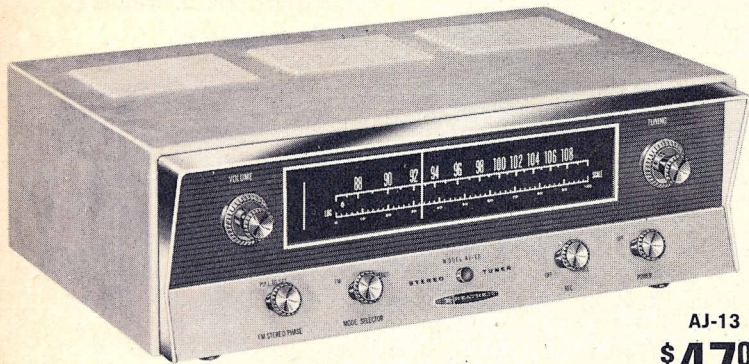
COMPARE THESE PROFESSIONAL FEATURES! In addition to the quality features that made the Lab 80 a favorite among discriminating audiophiles, the new Lab 80 Mk II boasts a newly styled, raised and easy-to-read control center with fluted tab levers; a new mat with deep rings at the 12", 10", and 7" positions which act as a stylus safety feature if someone should activate the automatic control without a record, causing the arm to come down accidentally; provision for automatic play of a single record; a new anti-skating compensator with accurate 1/2 gram settings, employing a counterweight with a window for easy setting; and a special adaptor to repeat records as often as desired. New ebony and walnut base optional. See pg. 31 for special cartridge offers with changer order.

- ADP-86, 25 lbs. . . . turntable . . . no money dn., \$10 mo. **\$99.50**
- ADP-86, 26 lbs., turntable and choice of any 1c cartridge, page 31 (specify by model no.) . . . no money dn., \$10 mo. **\$99.51**
- ADA-86-1, 5 lbs. . . . matching walnut base **\$5.50**
- ADA-86-2, 1 lb. . . . Garrard LRS9 45 rpm spindle **\$5.95**

ADP-86 SPECIFICATIONS—Speeds: 33¹/₃ & 45 rpm. **Motor:** 4-pole shaded, completely isolated. **Tracking:** Tracks per cartridge specifications. **Color:** Special 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:** 17" W x 14¹/₄" D x 5¹/₂" above and 3¹/₂" below motor board.

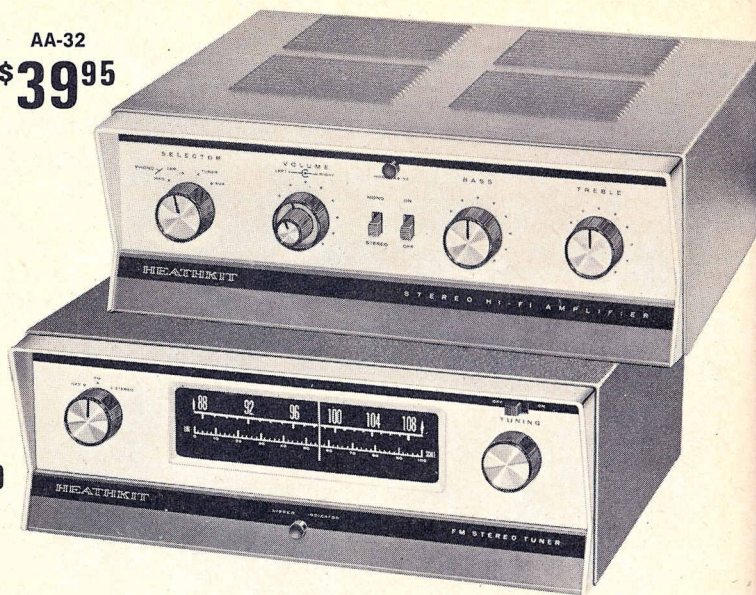


For Budget-Minded Music Lovers...



AJ-12
\$65⁹⁵

AA-32
\$39⁹⁵



AJ-13
\$47⁰⁰

Attractive In Styling And Price ... AJ-12 FM/FM Stereo Tuner

- Built-in FM stereo adapter • FM stereo indicator light • Stereo phase control for maximum station separation, minimum distortion • Adjustable AFC for drift-free reception • Bar-type "Eye" tuning indicator • Filtered stereo outputs • Fast, simple circuit board construction • Handsome designer styling ... matches AA-151 amplifier p. 26

Performance And Features Compare To Units Costing Twice Its Price. Like the FM multiplex circuit that's an integral part of the tuner ... the stereo indicator that signals whenever stereo is being received ... the unique phase control for maximum stereo separation with minimum distortion ... the automatic frequency control for crisp, clear drift-free reception ... filtered stereo outputs for natural beat-free stereo recording ... bar-type "eye" tuning indicator for pin-point reception ... lighted slide-rule dial and effortless flywheel tuning.

Fast, Simple Assembly ... Designer Styling. A prealigned, preassembled "front-end" coupled with quick, easy circuit board construction takes you from parts to performance in a few spare-time evenings. And the sturdy steel cabinet is handsomely clad in luggage-tan vinyl with a charcoal front panel and polished trim ... enriches any surroundings. Matches the AA-151 amplifier (pg. 26).

Kit AJ-12, 19 lbs. ...
no money dn., \$7 mo. \$65.95

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

AJ-12 SPECIFICATIONS—FM SECTION: Tuning Range: 88 MHz-108 MHz. Intermediate Frequency: 10.7 MHz. Antenna: Balanced input for external 300 ohm antenna. Internal line antenna. Image Ratio (30 microvolts—30% mod.—98 MHz): —45 db. Harmonic Distortion (25 microvolts—100% mod.—98 MHz: Less than 1%. IF Rejection (98 MHz): —65 db. FM Audio Response (20-20,000 Hz): ±1 db. AFC Correction Factor (Full AFC): 100 kHz per volt. AM Suppression: —27 db. Hum & Noise (25 microvolts, 30% mod): —48 db. Quieting Sensitivity: 20 db —2½ microvolts; 30 db —3½ microvolts. FM STEREO CONVERTER SECTION: Audio Frequency Response: ±2 db from 50 to 15,000 Hz. Sub-Carrier Bandpass: ±3 db from 23,000 to 53,000 Hz. Channel Separation: 30 db or more at 1 kHz; 25 db or more at 10 kHz. Size: 5¼" H x 15¾" W x 10½" D.

High Performance Features ... Simple To Assemble & Use ... Money-Saving Price ... FM/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 opposite

With The AJ-13, You Enjoy Maximum Performance with minimum adjustments. Just 3 controls to operate ... on/off-FM-stereo selector; tuning control, and AFC on-off switch. What could be simpler? And yet, you enjoy features like the automatic frequency control that locks stations in for clean, drift-free reception ... stereo indicator that lights when stereo is received ... lighted slide-rule dial, flywheel tuning for quick, accurate station selection ... filtered outputs for stereo tape recording ... plus point-to-point wiring and a preassembled, prealigned "front-end" for fast, simple construction—takes just a few enjoyable evenings.

You'll Like The Modern Color Styling, Too ... mocha brown, all steel cabinet with a neutral beige front panel and black accents, blends with any decor, traditional or modern! Matches the AA-32 Amplifier (opposite).

Settle Back, Relax And Listen. The sound's superb, the operation simple, the styling attractive, the savings great. Order now.

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

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

AJ-13 SPECIFICATIONS—Tuning range: 88 to 108 MHz. Intermediate frequency: 10.7 MHz. Quieting sensitivity: 2½ uv for 20 db of quieting; 3½ uv for 30 db of quieting. Audio frequency response: Mono—±1 db from 20 to 20,000 Hz. Stereo—±2 db from 50 to 15,000 Hz. Antenna: Balanced input for external 300 ohm antenna. Channel separation: 25 db or more at 1000 Hz. Front panel controls: Tuning selector switch, power off-FM-stereo; AFC switch, off-on. Dimensions: Overall: 13½" W x 4¼" H x 9½" D.

Matching 20-Watt Stereo Amplifier ... Full Controls ... Operates With Magnetic And Ceramic Cartridges

- 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 • Easy to build ... goes from parts to performance in a few evenings

Plenty Of Versatility ... plenty of clean, undistorted power. A full 16 watts continuous, 20 watts music power from 30 to 30,000 Hz at ±1 db at 8 watts per channel. Four stereo inputs handle magnetic phono and ceramic phono cartridges, tuner, & auxiliary sources.

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

Two Push-Pull Power Output Stages, plus 2 four-stage preamps highlight the 7-tube amplifying circuit. The power supply is a completely transformer operated, full-wave doubler silicon-diode circuit.

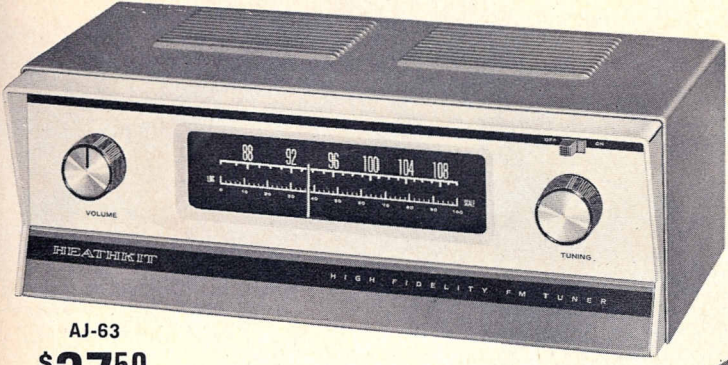
Goes From Parts To Power in just a few evenings with simple-to-follow instructions, and easy point-to-point wiring.

Begin Now ... add a top-notch stereo system at low cost ... with both the AA-32 Amplifier and matching AJ-13 Tuner.

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

AA-32 SPECIFICATIONS—Recommended System Mates: Speakers: AS-163, AS-133, AS-123, pg. 41. Speaker Systems: AS-51, AS-81, pg. 37 & 38. changers & turntables, pgs. 31, 32 & 33. **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 4¼" H x 9¼" D.

Low-Cost "Tube-Type" Stereo



AJ-63
\$37⁵⁰

Low-Cost FM Monophonic Tuner . . . Converts To Stereo With AC-11 Multiplex Converter

- 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 pg. 36 in styling & performance

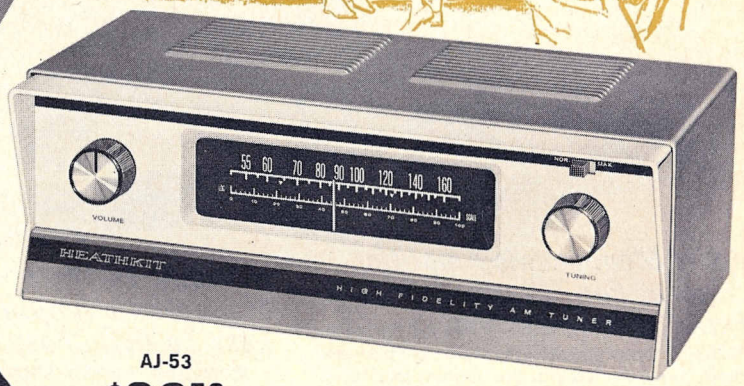
Compare The AJ-63's Features! A switched Automatic Frequency Control prevents "drifting" . . . locks in desired station for clear, sharp reception. Its limiter-ratio detector assures stable, broadband FM reception. A cathode follower output minimizes hum and high frequency cable losses . . . allows installation with virtually any system. And with the large, easy-to-read slide-rule dial and smooth flywheel tuning, station selection is precise, easy. The "Heath-Engineered" 5-tube circuit works like 9 tubes, and its safe transformer power supply features a modern silicon-diode rectifier.

Quick & Easy To Build!—Famous Heath step-by-step instructions and large "exploded" diagrams show you where every part goes. No special skills or knowledge required. The critical "front-end" tuner is already factory assembled and aligned . . . speeds construction and assures top performance. And you enjoy "do-it-yourself" savings, plus the pride and fun of building a sophisticated hi-fi component yourself.

Easily Converts To Stereo! Features a built-in multiplex output connector . . . simply plug in a multiplex converter like the Heathkit AC-11 opposite.

Kit AJ-63, 10 lbs., no money dn., \$5 mo. \$37.50
Export model available for 115/230 V. AC, 50-60 Hz; write for prices.

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: 4 1/8" H x 13 3/4" W x 7 1/2" D.



AJ-53
\$26⁵⁰

Enjoy A New Dimension In AM Hi-Fi Listening With This Low-Cost AM 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 • 10kHz whistle filter • Voltage doubler detector for lowest distortion • Mocha brown, beige & black styling matches AA-13 & AA-23 amplifiers, pg. 36

Features A Special Fidelity Switch for unusually high selectivity with normal bandwidth or optimum high fidelity with maximum bandwidth. A full-wave voltage doubler detector assures lowest distortion. Two outputs are provided—one is a "variable" cathode follower for direct driving of power amplifiers, the other is "fixed" for use with preamplifiers. Other High Performance Features include a built-in high gain ferrite antenna, plus terminals for an outside antenna . . . heavy, die-cast flywheel tuning for accurate station selection . . . easy-to-read, lighted slide-rule dial . . . and point-to-point wiring for fast, simple assembly.

Kit AJ-53, 11 lbs., no money dn., \$5 mo. \$26.50
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AJ-53 SPECIFICATIONS—Tuning range: 550 kHz to 1600 kHz. Intermediate frequency: 455 kHz. Sensitivity (for 20 db quieting IHFM 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, 4 1/8" H x 13 3/4" W x 5 1/2" D.



AC-11A
\$23⁵⁰

Add Stereo Realism To Your FM Tuner With This Deluxe Heathkit Multiplex Converter

- Use with most FM tuners having a multiplex output • Compact . . . fits anywhere • Styled to match Heathkit tuners • Built-in power supply • Easy to build . . . easy to operate

Features Built-In Power Supply with silicon rectifier, 3 tubes and prealigned coils. Simplified balanced diode detector assures low distortion. Marry it with any good FM tuner such as the Heathkit AJ-63 for complete stereo listening. Convert now . . . order yours today!

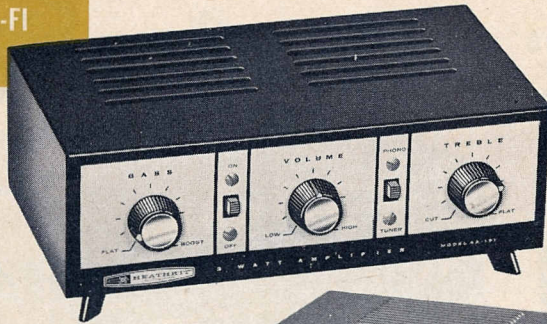
Kit AC-11A, black, 4 lbs. \$23.50
Kit AC-11B, tan, 5 lbs. \$23.50

AC-11 SPECIFICATIONS—Audio frequency response: ±2 db 50 to 15,000 Hz. Subcarrier bandpass: ±4 db 23,000 to 53,000 Hz. Channel separation: 30 db. Hum and noise: —55 db (relative to 1 volt rms output). Input impedance: 470 K ohms. Output impedance: 3000 ohms each channel (cathode follower output). Input: MULTIPLEX (from tuner). Input signal voltage: .4 volt minimum (from multiplex output of FM tuner). Outputs: LEFT CHANNEL; RIGHT CHANNEL. Switch and controls: OFF-ON switch; CHANNEL SEPARATION control; LEFT CHANNEL LEVEL control; RIGHT CHANNEL LEVEL control. Tube-diode complement: 1-12AU7 Amplifier—Cathode Follower; 1-12AU7 Amplifier-Oscillator; 1-12AU7 Cathode Follower Output; 2-Silicon Diode Rectifiers; 2-Crystal Diode Detectors. Power requirements: 117 volts AC 50/60 Hz, 12 watts. Size: 3 3/8" H x 3 3/8" W x 9 7/8" D.

Heathkit Performance Specifications Are Guaranteed



Low-Cost Tube-Type Hi-Fi Components



AA-191
\$15⁹⁵



AA-23
\$42⁹⁵



AA-13
\$29⁹⁵

3-Watt Monophonic Amplifier ... Ideal For "Starter" Or "Extra" Music System

- Built-in preamplifier • Two switch-selected inputs • Separate bass, treble & volume controls • 3-watt output, ± 1 db from 60 to 15,000 Hz • Less than 3% distortion at rated output • Satin black & ivory color styling • Simple to build & operate

Compact Size, Yet Versatile In Performance. Fits just about anywhere, and delivers 3 watts of power from 60 to 15,000 Hz at ± 1 db. Perfect for the hi-fi beginner, or the heart of a low-cost second hi-fi system.

Features A Built-In Preamplifier with switch selection of two inputs for crystal or ceramic phonograph, tuner, etc. Has volume, bass treble tone controls, plus outputs for 4, 8 and 16 ohm speakers. Produces sound levels of 85 to 88 db without any audible distortion . . . more than enough volume for average listening.

Assembles Easily In An Evening. Fits nicely on a bookshelf, end-table . . . any limited-space area. Handsome black metal cabinet and ivory front panel.

Kit AA-191, 8 lbs. \$15.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AA-191 SPECIFICATIONS—RECOMMENDED SYSTEM MATES: Speakers: AS-41, AS-81, pg. 39. **Power output:** 3 watts, Heath Utility Rated. **Power response:** ± 1 db 60 Hz to 15,000 Hz at 3 watts output. **Harmonic distortion:** Less than 3% 60-15,000 Hz at 3 watts output. **Intermodulation distortion:** Less than 3% at 3 watts output, 60 and 6,000 Hz signal mixed 4:1. **Hum and noise:** 70 db below 3 watts. **Input sensitivity:** 0.15 v for 3 watts output, crystal phono and tuner. **Outputs:** 4, 8 and 16 ohms. **Controls:** bass, treble, volume, input selector switch, on-off switch. **Power requirements:** 117 v. 60 Hz, 49 watts. **Color and finish:** Satin black, ivory face panel. **Dimensions:** 9 1/2" W x 3 3/4" H x 6" D.

Heathkit 16-Watt Monophonic Amplifier . . . Easy To Own, Easy To Build

- 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 & AJ-53 tuners, pg. 35

Compare These Additional Features! The patented Ultra-Linear® output circuit assures full-range sound with low distortion and noise. Has EL-84 output tubes and specially-designed output transformer with taps for 4, 8 and 16 ohm speakers. And a filament balance control virtually eliminates AC hum even at low volume levels.

Simple To Operate & Build. Just switch to the desired program source, set the volume and tone controls. Assembles in just a few relaxing evenings.

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-51, pg. 38; AS-10, pg. 37. All turntables, pgs. 31, 32 & 33. **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:** 4-15/16" H x 13 1/2" W x 10 1/2" D.

For All-Around Hi-Fi Performance, Choose This Versatile 30- Watt Monophonic Amplifier

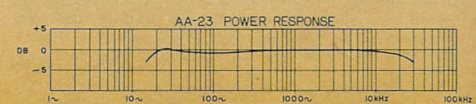
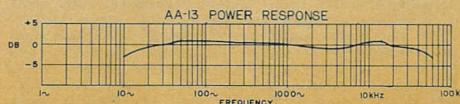
- Hi-Fi rated at 25 watts continuous, 30 watts IHF music power • 4 front-panel selected inputs • Power response ± 1 db from 30 to 15,000 Hz • Separate bass & treble controls • Ideal for limited-space installations • Mocha brown & beige color styling with black trim . . . matches AJ-63 & AJ-53 tuners, pg. 35

Use For Hi-Fi System Or Public Address Applications! Houses preamp, amplifier, and power supply in one "bookshelf-size" unit. Features 4 separate inputs for microphone, mag. phono crystal or ceramic phono cartridge, and an auxiliary source. Output transformer is tapped for 4, 8 and 16 ohm speakers. And the heavy-duty, shielded power transformer assures years of dependable service. Fixed bias push-pull 7591 output tubes deliver full-rated output with minimum distortion.

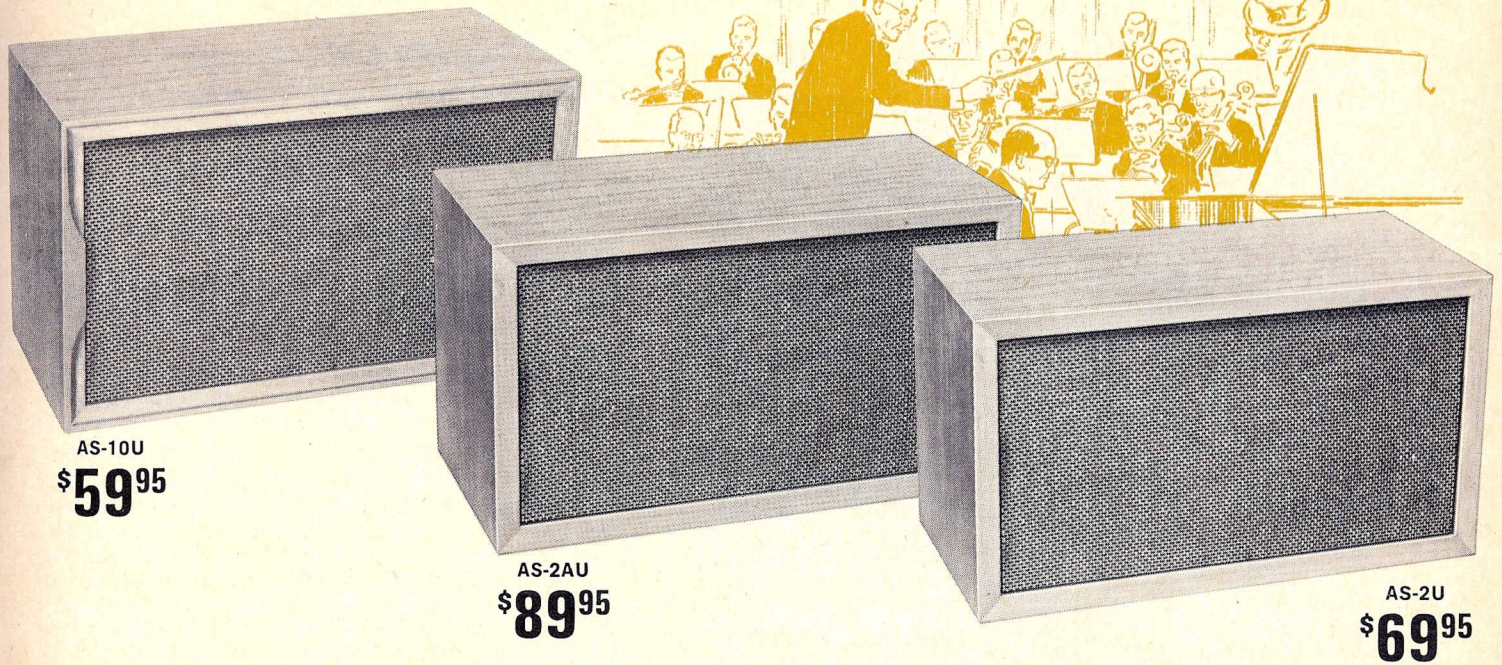
Modern Decorator Styling. Mocha brown metal cabinet with beige front panel and black trim . . . matches any decor.

Kit AA-23, 20 lbs., no money dn., \$5 mo. \$42.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

AA-23 SPECIFICATIONS—RECOMMENDED SYSTEM MATES: Speakers: AS-2, AS-2A, AS-10, pg. 37; AS-51, pg. 38; AS-173, AS-183, AS-163, pg. 40. All changers & turntables, pgs. 31, 32 & 33. **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:** 13 1/2" W x 4-15/16" H x 9 1/2" D.



Acoustic Suspension Speaker Systems



AS-10U
\$59⁹⁵

AS-2AU
\$89⁹⁵

AS-2U
\$69⁹⁵

Your Best Value In An Acoustic Suspension Speaker System

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

Like To Own An Acoustic Suspension System? But feel they're too costly, or that the added expense of a new amplifier powerful enough to drive one is not warranted? Then take a close look at the Heathkit AS-10. Here is an acoustic suspension system with the extended bass response, smooth high frequency response and substantially lower distortion that has made this type of system a favorite of audiophiles 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 . . . and costs far less than comparable units.

Why Is This System So Distortion-Free? The speaker cone is mounted with a very free suspension that provides part of the elastic restoring force normally required. The full restoring force is then re-introduced via the pneumatic "spring" of the air enclosed by the cabinet. The cone literally "rides on air" instead of mechanical springs, thus reducing harmonic distortion.

Covers 30 To 15,000 Hz. Includes a high frequency control and L-C crossover network. Its compact cabinet can be used vertically or horizontally, and is available in walnut or unfinished white hardboard. Easy to assemble . . . pure pleasure to hear.

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. 16; AA-22, pg. 20; AA-100, pg. 26; AA-151, pg. 27; AA-13 & AA-23, pg. 36; AR-13A, pg. 18. 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, Syntax 6 ceramic magnet; Tweeter, two 3½" cone units in dispersed array, 1.47 oz. Alnico 5 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.

Deluxe Acoustic Suspension System Acoustic Suspension Woofer . . . Super Tweeter For Extended Highs

- 10" acoustic suspension woofer • 1¾" dome-type super tweeter extends high frequency response to 20,000 Hz • Two 5" cross-fired mid-range speakers • Built-in crossover networks • High frequency level controls • Preassembled cabinets

What Makes This System Different? The addition of a specially designed super tweeter that extends the already remarkable performance range of this system to a full 40-20,000 Hz. For you this means enjoying

distortion-free reproduction over the entire frequency range . . . from the full high-pitched shrill of a clarinet to the full impact of a kettle drum . . . with an astounding authenticity you never dreamed possible in a system this size.

Clean, Clear Bass Response With Low Harmonic Distortion. Made possible by the employment of the acoustic suspension principle where the woofer cone literally suspends in air, thus eliminating the mechanical springs which cause distortion in most other speakers. In the AS-2A, a "cushion" of air inside the air-tight cabinet acts as a restoring force. Result? Full, rich sound with virtually no distortion!

The super tweeter and two mid-range cross-fired speakers are individually controlled by separate level controls. Easy to assemble, too . . . just mount speakers in preassembled cabinet, wire the crossover network, and fill the cabinet with the fiberglass furnished. Pick a pair for stereo!

Kit AS-2AU, unfinished, white hardboard, 51 lbs. . . no money down, \$9 mo. \$89.95
Kit AS-2AW, finished walnut, 51 lbs. . . no money down, \$10 mo. . . . \$96.50

AS-2A SPECIFICATIONS—Recommended amplifiers: AA-21D, pg. 16; AA-100, pg. 26; AA-22, pg. 20; AA-23, pg. 36; AR-13A, pg. 18. Frequency response: ±5 db, 40 to 20,000 Hz. Impedance: 8 ohms. Recommended amplifier power: 20 watts minimum. Enclosure: Infinite baffle, sealed. Speakers: Woofer, 10" Acoustic Suspension, 1.1 lb. Alnico 5 magnet; Midrange, two 5" cone units, in dispersed array, 2.15 oz. Alnico 5 magnets; Super-tweeter, 1¾" dome-type construction. Crossover: L-C network, 2000 & 7500 Hz. Controls: Individual levels for tweeter and mid-range speakers. Dispersion: 90° horizontal. Cabinet: Factory assembled ¾" furniture-grade plywood. Dimensions: 13½" H x 24" W x 11½" D.

Versatile Acoustic Suspension System

- 10" acoustic suspension woofer • Two 5" cross-fired tweeters
- Wide-range sound with compact speaker versatility • Easy to build with preassembled cabinet

Smooth, Distortion-Free Sound In A Compact Enclosure! That's what you enjoy with the AS-2U. It's space-saving cabinet fits just about anywhere. And its superb acoustic suspension, 10" woofer with a 1 lb. Alnico 5 magnet delivers extended bass frequency response with extremely low distortion. The 2000 Hz L-C crossover network combined with the specially treated and equalized 5" cross-fired tweeters provide unusually clear high frequency distribution.

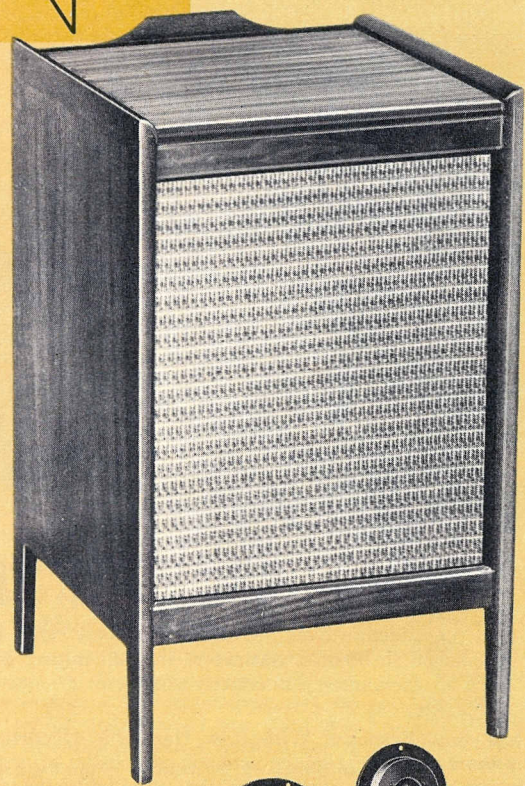
Easy To Build . . . You Enjoy The Savings! Simply mount the speakers in the preassembled cabinet, and connect the leads . . . goes together in a couple of hours. And the cabinet is unfinished, so you can apply the finish of your choice to harmonize with any room's decor. Choose a pair for stereo.

Kit AS-2U, unfinished, 45 lbs. . . no money down, \$7 mo. \$69.95
AS-2U SPECIFICATIONS—Recommended amplifiers: AA-21D, pg. 16; AA-100, pg. 26; AA-22, pg. 20; AA-23, pg. 36; AR-13A, pg. 18. Frequency response: 40 to 15,000 Hz. Crossover frequency: 2,000 Hz. Recommended amplifier power: 20 to 40 watts RMS. Nominal impedance: 8 ohms. Tweeter: Two 5" cone units, specially treated and equalized, in dispersed array, 2.15 oz. Alnico 5 magnet. Woofer: 10" Acoustic Suspension, 1.1 lb. Alnico 5 magnet. Resonant Frequency (mounted) 58 Hz. Crossover: L-C network. Horizontal dispersion: 90°. Size: 24" W x 13½" H x 11½" D.



STEREO HI-FI

Get The Most Sound For Your Dollar . . .



AS-15
\$144⁹⁵



4 Special Speakers . . . 12" high compliance woofer, plus 3 speakers of the direct radiator type . . . two mid-range 2" dome-type, and 1" dome-type for the highs.

Deluxe Heathkit 3-Way System . . . Features 4 Speakers Of Special Design

- 12" high compliance, low resonance woofer • Two special design 2" direct radiator dome-type mid-range speakers • Special design 1" direct radiator dome-type ultra-high frequency tweeter • Response 40 to 20,000 Hz • Big voice coils • Heavy ceramic ring magnets • 50-watt program material power capability • High frequency attenuator • Middle frequency attenuator • Preassembled walnut finish enclosure measures 18½" W x 19" D x 32¾" H • Tube vented, bass reflex design • Styled to match Heath contemporary equipment center

NO MORE OF THE INADEQUATE "LITTLE BOX" . . . the AS-15 is a well-blended combination of full frequency range response and high power capabilities . . . all in a reasonably sized enclosure.

USES THE LATEST IN SPEAKER DESIGNS. Now enjoy the advantages of direct radiating speakers with their brilliance and clarity in the mid-range frequencies. Both mid-range units have 6¼" frames with 4½" ceramic ring magnets weighing 1 lb., and 2" dome radiators which are driven by 1½" voice coils. The ultra high frequency tweeter has a 4¼" frame with a 2¼" ceramic ring magnet weighing 6 oz. Its 1" radiating surface is driven by a 1" voice coil.

HIGH COMPLIANCE WOOFER. The bass notes of this system originate from its 12" high compliance woofer which features a 1½" voice coil and a 1 lb. 11 oz. ceramic ring magnet. Free air resonance is 25 Hz.

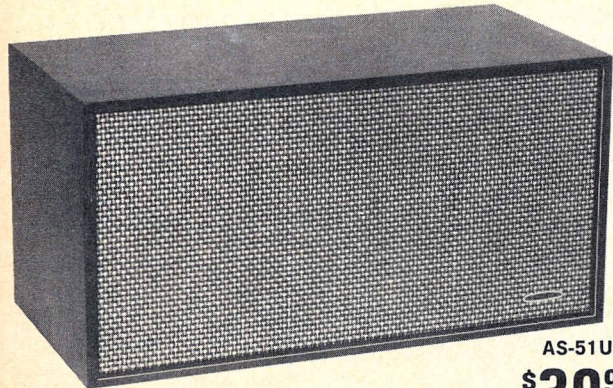
3-WAY CROSSOVER NETWORKS. LC and RC types. Crossover points: 1000 Hz and 10,000 Hz. Two attenuators: high frequency and mid-frequency, range from full to cutoff, so you can adjust the sound to your preference and room acoustics.

POWERFUL . . . easily handles 50 watts, yet can be driven by as little as 5 watts.

ATTRACTIVE FLOOR MODEL CABINET . . . styled in rich walnut finish to match Heath contemporary cabinet (pg. 42). Factory assembled of ¾" solids and veneers.

Kit AS-15, 82 lbs. . . (REA Express or Motor Frt. Only) . . . No money dn., \$14 mo. **\$144.95**

AS-15 SPECIFICATIONS—Recommended Amplifiers: AR-13A, pg. 18; AR-14, pg. 18; AA-21D, pg. 16; AA-22, pg. 20; AA-100, pg. 26; AA-151, pg. 27; AA-32, pg. 34; AA-13 & AA-23, pg. 36; AA-14, pg. 24. **Frequency response:** 40 to 20 kHz. **Crossover frequencies:** Low 1000 Hz to high frequency 10 kHz. **Power rating:** 50 watts of program material. **Nominal impedance:** 8 ohms. **Speakers:** (1) 12" Jensen high compliance, low resonance, low frequency; (2) 2" direct radiator dome-type mid-frequency; (1) 1" Jensen direct radiator dome-type ultra high frequency speaker. **Crossover network:** three channel: Low frequency, low pass LC type; Mid-frequency bandpass LC type; High frequency, high pass RC type filter. **Cabinet:** Walnut finished, tube vented type. **Dimensions:** Overall; 18½" W x 19" D x 32¾" H.



AS-51U
\$39⁹⁵

- Specially designed speakers . . . 8" woofer & compression-type tweeter with flared horn • Built-in 1600 Hz crossover network • Tweeter level control
- Cabinets available unfinished or in walnut finish

A Favorite Of Thousands . . . Low Cost 2-Way Hi-Fi System

EVERYTHING YOU NEED FOR GOOD LISTENING, including the right price. Covers 50 to 12,000 Hz range at ±5 db with two specially-designed speakers . . . an 8" woofer and true compression-type tweeter with exponential horn. A 1600 Hz crossover network is built-in, and a control is provided to adjust tweeter power level. Speaker impedance is 16 ohms, and it will handle as much as 25 watts power. A special tweeter mounting board may be rotated for wide angle dispersion in either vertical or horizontal mounting position. The "Heath-Designed" bass-reflex cabinet comes preassembled either in walnut veneer or unfinished white hardwood. Assembles easily in a couple of hours . . . simply mount the speakers, and wire the crossover network . . . everything else is pre-built. Choose a pair for stereo.

Kit AS-51U, unfinished, 27 lbs. . . No money dn., \$5 mo. **\$39.95**
Kit AS-51W, Walnut, 27 lbs. . . No money dn., \$5 mo. **\$46.95**

AS-51 SPECIFICATIONS—Recommended amplifiers: AR-14, pg. 19; AA-14, pg. 24; AA-32, pg. 34; AA-151, pg. 27; AA-21D, pg. 16; AA-22, pg. 20; AA-100, pg. 26; AA-13 & AA-23, pg. 36. **Frequency response:** 50 to 12,000 Hz. **Crossover frequency:** 1600 Hz. **Power rating:** Program material—25 watts. Single frequency—15 watts. **Nominal impedance:** 16 ohms. **Speakers:** Low frequency—8" Jensen (special design) 6.8 oz. Alnico 5; High frequency—Jensen compression driver with exponential horn (special design), 4.7 oz. Alnico 5. L-PAD—level control for high frequency driver. **Dimensions:** 11½" H x 23" W x 11¼" D.

Choose A Heathkit® Speaker System



Known For Its Acoustical Excellence . . . Respected For Its Achievement In Sound Technology . . . The "Legato Compact"

• Speakers cover 30-22,000 Hz • 800 Hz crossover network—completely assembled • Can be driven by as little as 3 watts, handles up to 30 watts • Pre-assembled walnut-finished cabinet, ready for simple speaker installation • Styling matches AE-20 hi-fi equipment cabinet, pg. 42

FOR THE AUDIOPHILE WHO DEMANDS THE FINEST! . . . the "Legato Compact" . . . with a reputation among audio engineers and hi-fi buffs as a masterpiece in performance, styling and quality. Wait until you hear it!

WHAT MAKES THIS PERFORMANCE POSSIBLE? Begin with the two 12" Altec Lansing high-compliance low-frequency speakers that cover the 30 to 800 Hz range, capably, accurately. Next, a special Altec Lansing exponential horn and high frequency driver combination is incorporated to recreate the 800 to 22,000 Hz range with complete fidelity and brilliance. The 800 Hz crossover network is factory assembled, ready for easy installation in the carefully designed, acoustically correct cabinet.

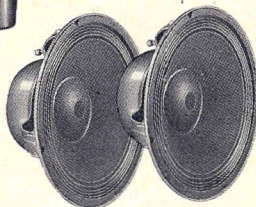
EFFICIENT—BEAUTIFUL! Use amplifiers with a power output as low as 3 watts, or as high as 30 watts. The handsome factory-assembled walnut-finished cabinet is constructed of ¾" furniture-grade plywood . . . matches the AE-20 equipment cabinet on pg. 42. Pick a pair for stereo.

Kit AS-21W, 142 lbs. . . (REA Express or Motor Frt. only), no money dn., \$22 mo. **\$239.95**

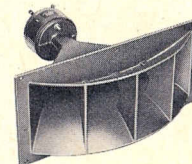
AS-21 SPECIFICATIONS — Recommended amplifiers: AR-13A, pg. 18; AA-21D, pg. 16; AA-22, pg. 20; AA-100, pg. 26; AA-14, pg. 24; AR-14, pg. 19. Frequency response: 30 to 22,000 Hz. Impedance: 16 ohms. Capacity: 30 watts. Enclosure: Modified Infinite baffle. Speakers: Low frequency, two Altec Lansing 12" high compliance woofers, 1½ lb. magnets; High frequency, one Altec Lansing 800 Hz exponential horn and driver, 53 lb. magnet. Crossover: 800 Hertz constant K type, assembled. Control: high frequency shelving. Dispersion: 90° horizontal. Cabinet: Factory assembled furniture-grade ¾" plywood. Dimensions: 32" W x 19" D x 32½" H.



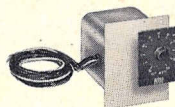
AS-21W
\$239⁹⁵



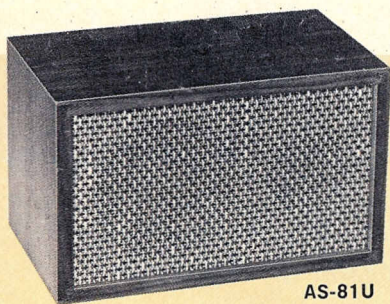
Low Frequency Speakers by Altec Lansing . . . famous, high compliance 12" speakers with 1½ lb. magnets . . . cover 30 to 800 Hz.



High Frequency Driver and specially designed exponential horn by Altec Lansing with .53 lb. magnet . . . covers 800 to 22,000 Hz . . . provides 90° horizontal distribution.



Crossover Network by Altec Lansing . . . 800 Hz constant K shelving type.



AS-81U
\$17⁵⁰

Miniature Hi-Fi 2-Way Speaker System . . . Ideal For Small Spaces

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

COMPACT SIZE, WIDE 70-16,000 Hz RANGE! High compliance type 6" woofer features a mass-loaded cone that's matched to the enclosure for good bass response. Closed-back, cone-type tweeter prevents speaker interaction. Assembles in a couple of hours. Order two for stereo.

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

AS-81 SPECIFICATIONS—Recommended amplifiers: AA-14, pg. 24; AA-32, pg. 34; AA-13, pg. 36; AA-151, pg. 27; AR-14, pg. 19. Frequency response: From 70 to 16,000 Hz. Crossover frequency: 4000 Hz. Recommended amplifier power: 6 watts. Nominal impedance: 8 ohms. Cabinet: Type: infinite. Dimensions: 10¾" W x 6½" H x 6¾" D; material, ½" veneer plywood. Speakers: Tweeter, 3" cone type, 8 ohms, .53 oz. Alnico 5 magnet; Woofer, 5½" cone type, 8 ohms, 10 oz. Syntox No. 6 magnet. Crossover: Capacitor type.

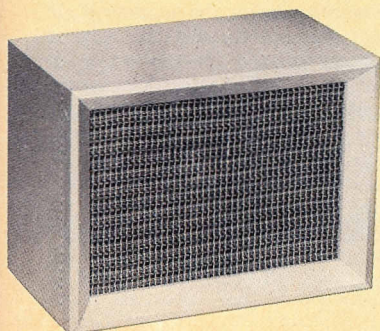
Low Cost Hi-Fi Speaker System . . . Ideal For A Variety Of Installations

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

COVERS 70 TO 14,000 Hz. Place in an extra room, use as an extension speaker to other rooms, and as a center fill-in for a stereo system. Handles up to 12 watts of program material. Compact in size and price. Choose two for stereo.

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

AS-41 SPECIFICATIONS—Recommended amplifiers: AA-14, pg. 24; AA-32, pg. 34; AA-151, pg. 27; AA-13, pg. 36; AR-14, pg. 19. Frequency response: 70 to 14,000 Hz. Impedance: 8 ohms. Capacity: 12 watts. Enclosure: Rear vented box. Speaker: 6" x 9" extended range dual cone, 6.8 oz. Alnico 5 magnet. Cabinet: Factory assembled, furniture-grade ½" plywood. Dimensions: 8" H x 11" W x 6½" D.



AS-41U
\$10⁹⁵



For Custom Installations, Choose From

B 12" 3-Way High Compliance, Edge-Damped Hi-Fi Speaker . . . Superb Reproduction Over 35-15,000 Hz Range

HANDLES UP TO 25 WATTS OF PROGRAM MATERIAL. Features a high compliance edge-damped woofer cone for rich, deep bass . . . a high frequency cone for mid-range realism and presence . . . and a special Heath designed tweeter for clear-as-a-bell highs.

SEPARATE HIGH FREQUENCY LEVEL CONTROL . . . permits adjustment to suit room acoustics. In addition, the AS-173 boasts built-in crossover networks . . . heavy die-cast metal frame for years of faithful service . . . 1½" and 1" voice coils . . . 1¾ lb. ceramic annular-ring magnet. Handsomely styled in 2-tone cinnamon and light tan. Includes cabinet recommendations and 1-year guarantee. This speaker will fill virtually every hi-fi listening need, and provide full range sound . . . at a low price. Choose a pair for extra savings.

Model AS-173, 14 lbs. . . no money dn., \$5 mo. \$39.95

Model AS-173-2, 28 lbs. . . no money dn., \$8 mo.

Special pair price. \$76.00

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

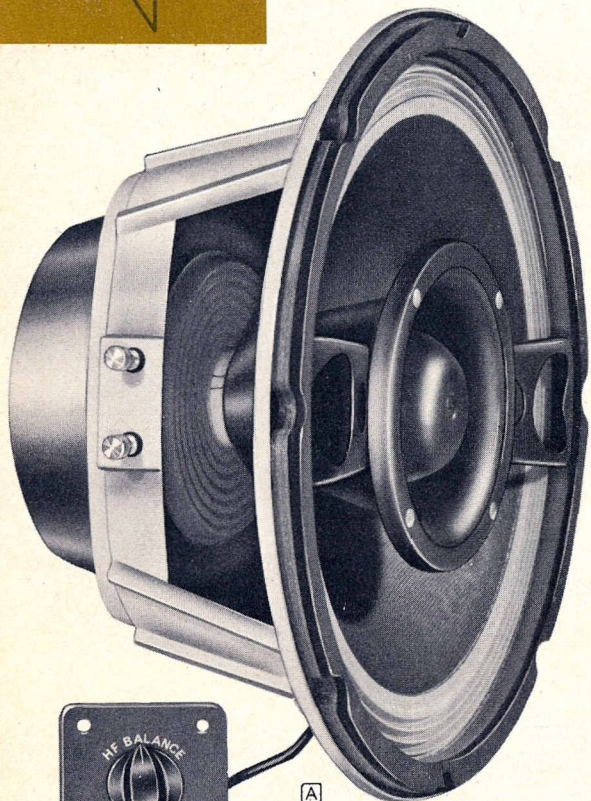


B \$39.95

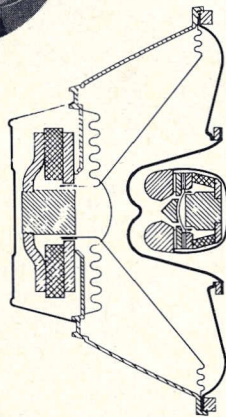
(pair \$76.00)

C \$29.95

(pair \$57.00)



A
AS-183
\$49.95
(pair \$95.00)



Special High Compliance, Edge-Damped 12" Speaker . . . provides bass response down to 20 Hz. Special ceramic annular-ring magnet for extra power handling capability. Sturdy reflexed-horn high frequency unit. Massive die-cast metal frame adds extra rigidity for precise alignment of speaker elements.

A Our Finest . . . Deluxe 12" Two-Way High Compliance, Edge-Damped Hi-Fi Speaker With Wide 20-15,000 Hz Response

SPECIAL ADVANCED DESIGN ASSURES EXTENDED BASS RESPONSE. A high compliance, edge-damped woofer cone, low crossover frequency and a reflexed horn high frequency unit combine to bring you an extremely wide 20 to 15,000 Hz response . . . provides astounding realism. Easily handles up to 30 watts of program material.

USES THE FINEST MATERIALS AVAILABLE. Like the heavy die-cast metal frame for precision alignment of all elements . . . high efficiency 1¾ lb. ceramic ring magnet . . . 1½" and 1" voice coils . . . separate high frequency level control to balance the "highs" . . . and polarized speaker terminals for proper phasing. Attractive 2-tone cinnamon and tan color styling. Includes 1-year guarantee and speaker cabinet recommendations. Order a pair for stereo . . . and enjoy the extra savings!

Model AS-183, 15 lbs. . . no money dn., \$5 mo. \$49.95

Model AS-183-2, 29 lbs. . . no money dn., \$10 mo.

Special pair price. \$95.00

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

C Fills A Host Of Hi-Fi Applications . . . 12" Deluxe 3-Way Coaxial Hi-Fi Speaker

REPRODUCES THE TRUE QUALITY OF ANY HOME MUSIC SYSTEM. Features true coaxial design with 3 separate radiating elements . . . woofer, tweeter, and a specially-designed horn tweeter. Boasts heavy, die-cast frame construction for precise alignment of speaker elements, and high efficiency ceramic annular-ring magnet that assures dependable, trouble-free performance. Handles up to 20 watts and covers 40-15,000 Hz. Mechanical and electrical crossover networks provide smooth sound transition. Polarized and color-dot coded speaker terminals assure proper phasing with your system. Cinnamon and tan color styling . . . separate high frequency level control for the tweeter . . . cabinet recommendations . . . 1-year guarantee. Order a pair for stereo and enjoy added savings.

Model AS-163, 12 lbs. . . No money down, \$5 mo. \$29.95

Model AS-163-2, 24 lbs., no money dn., \$6 mo., pair price. . . . \$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".

This Exclusive Speaker Series



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

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

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

AS-153 SPECIFICATIONS—Size: 12". Impedance: 8 ohms. Power rating: 15 watts. Frequency response: 50-15,000 Hz. Cone resonance: 60 Hz. Magnet weights: 10 oz., 1.47 oz. Voice coil sizes: 1" and 3/8".

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

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

MEASURES ONLY 3 3/8" Deep . . . Ideal for limited spaces. Complete with multi-speaker instructions and recommended cabinet recommendations. Guaranteed 1 full year. Choose a pair for stereo.

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

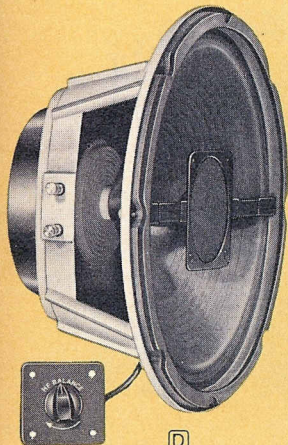
AS-133 SPECIFICATIONS—Size: 8". Impedance: 8 ohms. Power rating: 12 watts. Frequency response: 50-14,000 Hz. Cone resonance: 70 Hz. Magnet weights: 10 oz., 0.68 oz. Voice coil sizes: 1" and 3/8".

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

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

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

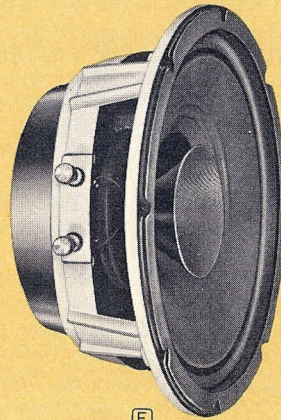
AS-123 SPECIFICATIONS—Size: 8". Impedance: 8 ohms. Power rating: 12 watts. Frequency response: 50-12,000 Hz. Cone resonance: 70 Hz. Magnet weight: 10 oz. Voice coil size: 1".



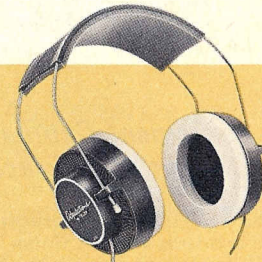
D AS-153
\$19.95
 (pair \$38.00)



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



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



H ADP-92
\$23.92



G ADP-135
\$15.95



I AC-13
\$9.95



Stereo Accessories For Private Listening . . . Armchair Comfort

G TELEX "Adjustatone" Stereo Headset

BIG 3 1/2" SPEAKERS—over 7 sq. inches of cone area—deliver an extremely wide frequency range of 10 to 15,000 Hz. Exclusive "Forward Sound" acoustic effect puts stereo sound up front . . . gives the dramatic stereo perspective of an audience seat! Adjust to normal "in-head" stereo by simply reversing the headphones. Foam cushions and light weight for listening comfort . . . easily adjustable. Operates from 3 to 16 ohm sources. 8' cord with phono plug.

Model ADP-135, 2 lbs. \$15.95

ADP-135 SPECIFICATIONS—Driver Element: Dynamic. Sensitivity: 100 db/mv. Frequency response: 10-15,000 Hz. Impedance: Designed to operate from 3-16 ohm output sources. Distortion: At Normal Listening Levels, less than 1%. Cord length: 8 ft. 4-wire with 3-circuit phono plug.

H For Deluxe Listening . . . TELEX ST-11 Stereo Headset

Relax and enjoy your favorite music anywhere in the room without destroying the "true" stereo effect! Soft, pliable foam rubber muffs

shut out "unwanted" outside noise . . . helps develop excellent bass response and wide frequency range! Comfortable, lightweight! Easy-to-clean stainless steel headband and yoke. Order yours now!

Model ADP-92, 2 lbs. \$23.92

ADP-92 SPECIFICATIONS—Driver element: Dynamic. Sensitivity: better than 95 db. Frequency response: 16 to 15,000 Hz. Impedance: 8 ohms for use with 3 to 16 ohm sources. Cord: 4-wire 12 ft. long with 3-circuit phono plug. Color: Tan & Brown.

I Heathkit Stereo Headphone Control Box

Enjoy the convenience of simply switching from speaker to private headphone listening *without* leaving the comfort of your favorite chair with the new AC-13 control box. It's versatile . . . connects to any amplifier regardless of power and has standard jacks to accommodate *any impedance* stereo headset! Allows separate control of 2 headphone sets, plus individual adjustment for each ear! Includes 15' of cable and assembles easily in 1 1/2 hours. Compact size . . . 3" W x 6" D x 3 1/4" H . . . fits anywhere! For more relaxed "private" listening, order yours now!

Kit AC-13, 3 lbs. \$9.95

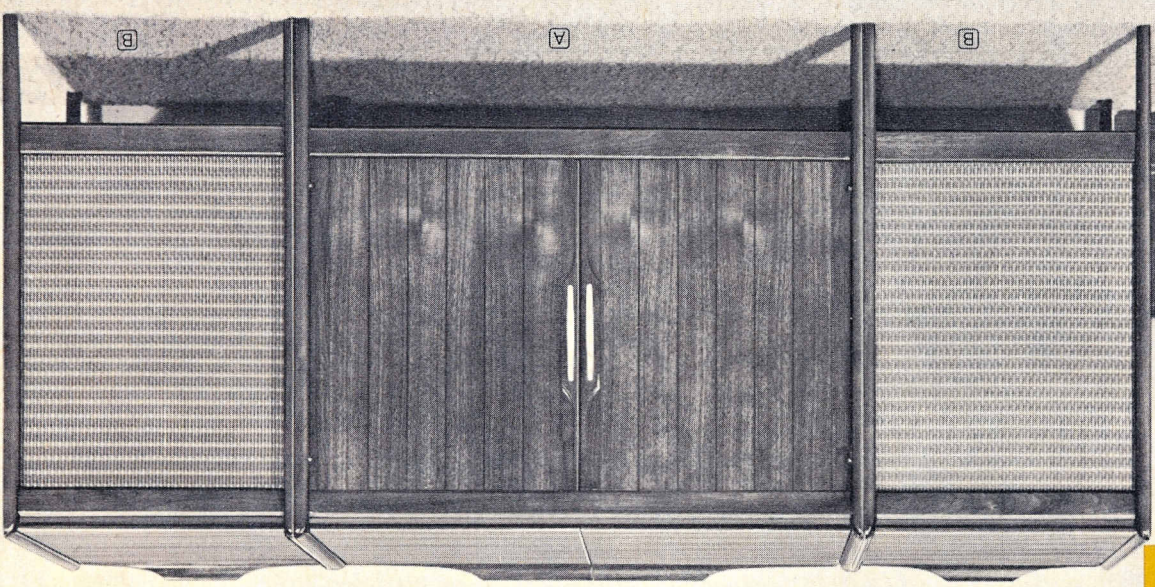
You Get Twice As Much For Your Budget With Heathkit



STEREO HI-FI

Complete System HFS-78 \$531.39

Exclusive Heath Hi-Fi Furniture... Beautiful



Deluxe Stereo Equipment Cabinet . . . Contemporary Styling With Practical Component Layout

• Custom designed for Heathkit Stereo/Hi-Fi components . . . accommodates most makes • Beautiful modern walnut finish • Factory assembled, ready for component installation • Speaker cabinet can be matched to any 12" or 15" speaker for best tone

A HOME ENTERTAINMENT CENTER OF ATTRACTION. Solidly constructed of fine furniture woods . . . accented with clean, eye-arresting reliefs. Slim, curved brass handles highlight the "sculptured" effect. And the rich walnut finish adds a modern touch that reflects good taste. You'll be proud to have this skillfully crafted equipment center in your home. Completely assembled, ready to house your hi-fi components.

AE-20 EQUIPMENT ACCOMMODATIONS AND SIZES—Cabinet, overall: 36" W x 32 3/4" H x 19" D. Changer compartment: 17" W x 15 3/4" D, mounting board is uncut and can be adjusted in height to accept all record changers sold by Heath; lid has adjustable friction-loaded support. Record-tape recorder compartment: 14 1/2" H x 17" W x 17" D, for record storage; space is convertible with accessory sliding drawers below to accommodate tape recorder. Shelf compartment: (2) each 17" W x 6" H x 17" D (inside shelf 14" deep); either shelf accepts any Heath Stereo or Mono tuner, stereo or mono combination amplifier. Power amplifier compartments: 8 3/4" H x 17" W x 15 1/4" D inside, accepts any Heathkit stereo or mono amplifier.

B DELUXE SPEAKER CABINET . . . MATCHES THE AE-20 IN STYLING. With the addition of the matching AE-40 speaker cabinets, you have a complete music system both in beautifully styled furniture and total stereo performance. Features a 3 3/8" x 10-3/16" slot for a horn tweeter.

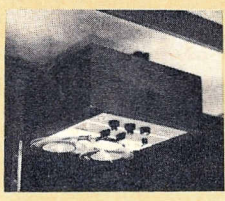
And you can match the AE-40 with any 12" or 15" speaker thanks to the AE-40's tube-vented design. A 12" fiberboard tube and instruction sheet are included to make this operation a simple one. For example, using the AS-183, pg. 40, you determine the proper tube length in relation to the speaker, the resonance by using the instruction sheet graph. For this speaker, the resonance is 25 Hz, so the tube length reading is 6". You then cut the pre-installed tube to 6" (see illustration opposite). That's all there is to it . . . you have a perfect speaker-to-cabinet match. Cabinet is preassembled. Measures 18 1/2" W x 19" D x 3 3/8" H. Order a pair for stereo.

Model AE-40W (walnut), 58 lbs. (Express or Motor Frt. only), no money dn., \$5 mo., each \$44.95

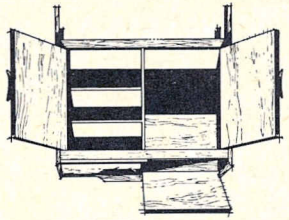
Matching Tape Recorder Drawer

Designed to fit the AE-20 equipment cabinet above. Dimensions: 7" H x 16" W x 16 1/2" D, wood 3/4" thick. NOTE: Will not fit AD-16 Recorder. See pg. 28 for special drawer provisions.

Model AEA-12-4, walnut uncut recorder drawer, 15 lbs., \$19.95



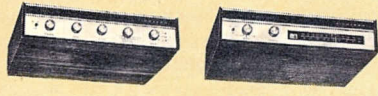
Save \$27.97 On This Transistor Stereo System!



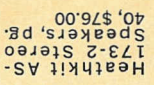
Includes AE-20W Equipment Cabinet (above), \$99.50 plus pair of AE-40W Speaker Cabinets (above), \$44.95 each.



ADP-86 Garrard Mk II Automatic Stereo Turntable with choice of 1c cartridge, pg. 31, \$99.51



Heathkit AJ-33A Transistor AM/FM/Stereo Tuner, pg. 24, \$94.50
Heathkit AA-22 66-Watt Transistor Stereo Amplifier, pg. 24, \$99.95



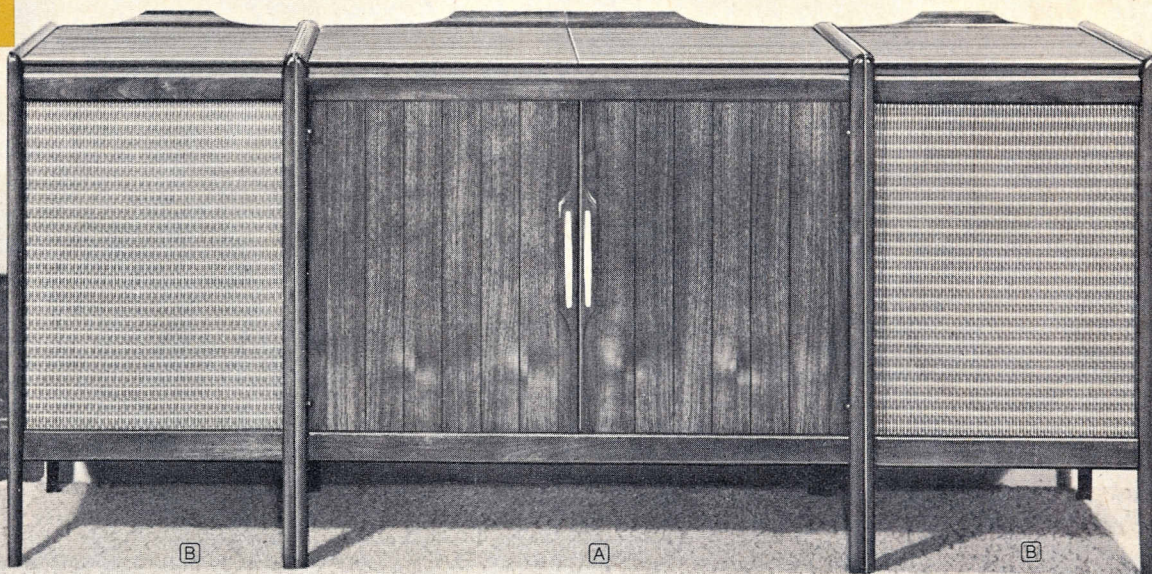
Heathkit AS-173-2 Stereo Speakers, pg. 40, \$76.00
Complete System Kit HFS-78. Reg. . . . \$559.36
Save 5% . . . \$ 27.97
You Pay Only . . . \$531.39



STEREO HI-FI

Exclusive Heath Hi-Fi Furniture... Beautiful

Complete System
HFS-78
\$531³⁹



Deluxe Stereo Equipment Cabinet . . . Contemporary Styling With Practical Component Layout

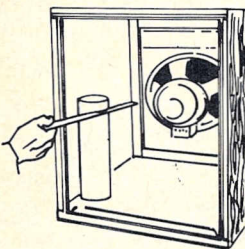
• Custom designed for Heathkit Stereo/Hi-Fi components . . . accommodates most makes • Beautiful modern walnut finish • Factory assembled, ready for component installation • Speaker cabinet can be matched to any 12" or 15" speaker for best tone

(A) HOME ENTERTAINMENT CENTER OF ATTRACTION. Solidly constructed of fine furniture woods . . . accented with clean, eye-arresting reliefs. Slim, curved brass handles highlight the "sculptured" effect. And the rich walnut finish adds a modern touch that reflects good taste. You'll be proud to have this skillfully crafted equipment center in your home. Completely assembled, ready to house your hi-fi components.

Model AE-20W (walnut), 82 lbs. (Express or Motor Frt. only.) no money dn., \$10 mo. . . . \$99.50

AE-20 EQUIPMENT ACCOMMODATIONS AND SIZES—Cabinet, overall: 36" W x 32³/₄" H x 19" D. **Changer compartment:** 17" W x 15³/₄" D, mounting board is uncut and can be adjusted in height to accept all record changers sold by Heath; lid has adjustable friction-loaded support. **Record-tape recorder compartment:** 14¹/₂" H x 17" W x 17" D, for record storage; space is convertible with accessory sliding drawers below to accommodate tape recorder. **Shelf compartment:** (2) each 17" W x 6" H x 17" D (inside shelf 14" deep); either shelf accepts any Heath Stereo or Mono tuner, stereo or mono combination amplifier. **Power amplifier compartments:** 8³/₄" H x 17" W x 15¹/₈" D inside, accepts any Heathkit stereo or mono amplifier.

(B) DELUXE SPEAKER CABINET . . . MATCHES THE AE-20 IN STYLING. With the addition of the matching AE-40 speaker cabinets, you have a complete music system both in beautifully styled furniture and total stereo performance. Features a 3⁵/₈" x 10-3/16" slot for a horn tweeter.



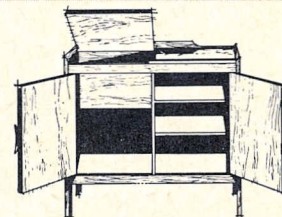
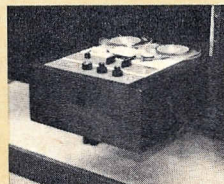
And you can match the AE-40 with any 12" or 15" speaker thanks to the AE-40's tube-vented design. A 12" fiberboard tube and instruction sheet are included to make this operation a simple one. For example, using the AS-183, pg. 40, you determine the proper tube length in relation to the speaker resonance by using the instruction sheet graph. For this speaker, the resonance is 25 Hz, so the tube length reading is 6". You then cut the pre-installed tube to 6" (see illustration opposite). That's all there is to it . . . you have a perfect speaker-to-cabinet match. Cabinet is preassembled. Measures 18¹/₂" W x 19" D x 32³/₈" H. Order a pair for stereo.

Model AE-40W (walnut), 58 lbs. (Express or Motor Frt. only.) no money dn., \$5 mo. . each \$44.95

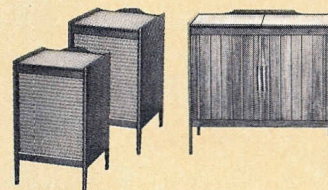
Matching Tape Recorder Drawer

Designed to fit the AE-20 equipment cabinet above. Dimensions: 7" H x 16" W x 16¹/₂" D, wood ³/₄" thick. NOTE: Will not fit AD-16 Recorder. See pg. 28 for special drawer provisions.

Model AEA-12-4, walnut uncut recorder drawer, 15 lbs. . . \$19.95



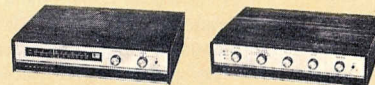
Save \$27.97 On This Transistor Stereo System!



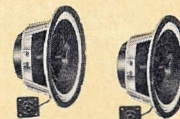
Includes AE-20W Equipment Cabinet (above), \$99.50 plus pair of AE-40W Speaker Cabinets (above), \$44.95 each.



ADP-86 Garrard Mk II Automatic Stereo Turntable with choice of 1c cartridge, pg. 31, \$99.51



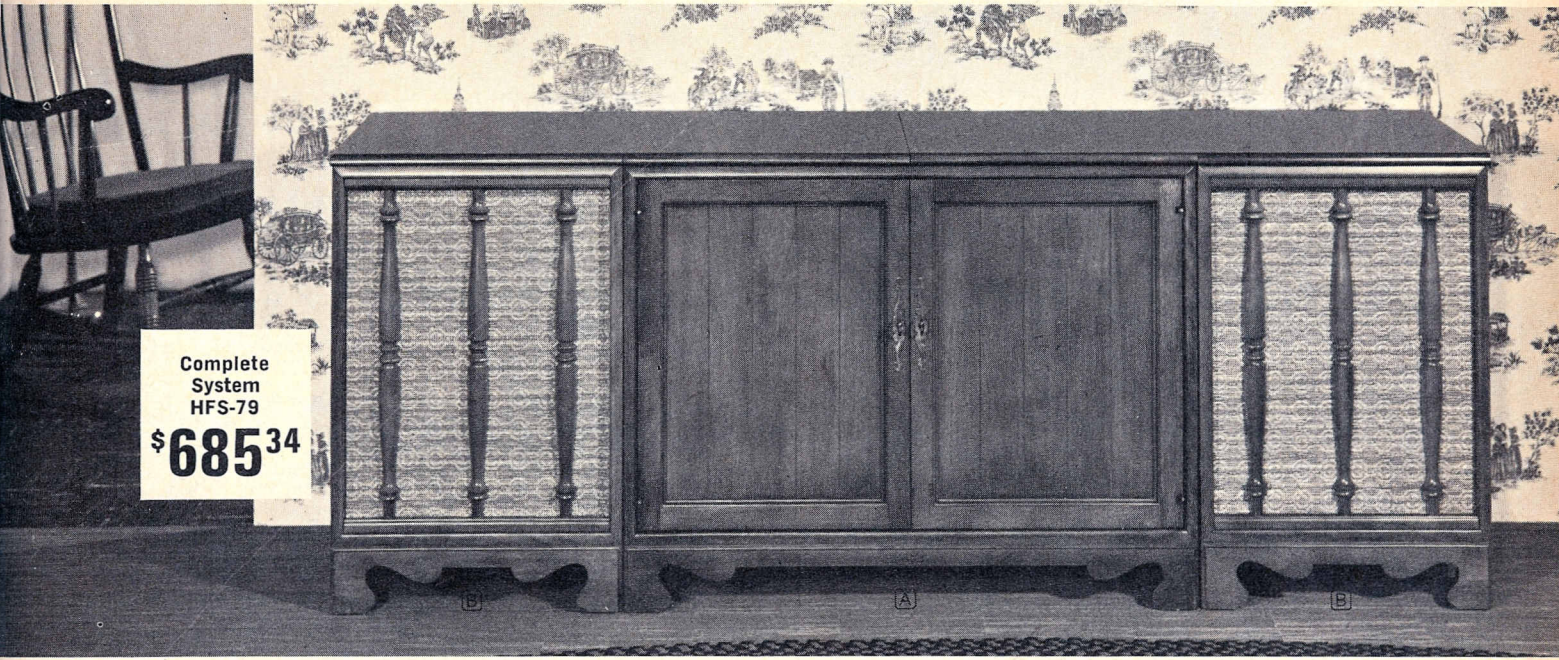
Heathkit AJ-33A Transistor AM/FM Stereo Tuner, pg. 24, \$94.50
Heathkit AA-22 66-Watt Transistor Stereo Amplifier, pg. 24, \$99.95



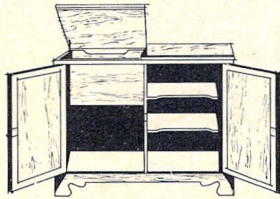
Heathkit AS-173-2 Stereo Speakers, pg. 40, \$76.00

Complete System Kit HFS-78.

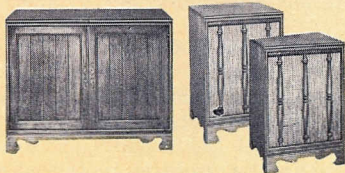
Reg. \$559.36
Save 5% \$ 27.97
You Pay Only **\$531.39**



Complete System
HFS-79
\$685³⁴



Save \$36.07 On Deluxe Transistor Stereo System!



Includes AE-13S Equipment Cabinet (above), \$115.00, plus pair of AE-23S Speaker Cabinets (above), \$55.00 each.



ADP-55 Dual 1019 Automatic Stereo Turntable with choice of 1c cartridge, pg. 32, \$129.51

Heathkit AJ-43D Transistor AM/FM/FM Stereo Tuner, pg. 18, \$109.00 with AE-11 walnut cabinet, \$12.95



Heathkit AA-21D 100-Watt Transistor Stereo Amplifier, pg. 19, \$137.00 with AE-11 walnut cabinet, \$12.95



Heathkit AS-183-2 Stereo Speakers, pg. 40, \$95.00

Complete System Kit HFS-79.
Reg. \$721.41
Save 5% \$36.07
You Pay Only... \$685.34

For Audiophiles With An Eye As Appreciative As Their Ear . . . Heath "Early American" Stereo Furniture

- Custom designed for Heathkit components • Holds most hi-fi/stereo components
- Stunningly styled in a special Heathkit motif • Luxuriously finished in fashionable salem-maple • Factory-assembled, ready to use

[A] EARLY AMERICAN RICHNESS WITH MODERN COMPONENT LAYOUT. With this new richly crafted Heathkit Stereo/Hi-Fi Furniture, you have all the beauty and styling of Early American combined with the right touch of the modern in its low, compact size and practical component compartment layout. Adds a touch of luxury and good taste to any room!

EXCLUSIVE HEATHKIT STYLING . . . SPECIALLY-SELECTED WOODS. This superb furniture is sturdily constructed with a special combination of maple veneers and solids . . . all beautifully finished in popular salem-maple! The over-all effect is enriched by the handsomely styled "Lancaster-Antique" solid-brass handles.

COMPLETELY FACTORY ASSEMBLED & FINISHED. Ready to accommodate Heathkit components, and will accept most any type or model of Stereo/Hi-Fi equipment. Make your home entertainment center, the center of attraction in your home . . . order this beautiful furniture now!

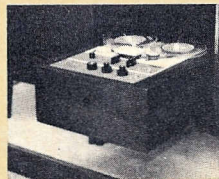
Model AE-13S, 76 lbs. (REA Express or Motor Frt. Only) . . . no money dn., \$11 mo. . . \$115.00

AE-13S EQUIPMENT ACCOMMODATIONS AND SIZES: Cabinet, overall: 28" H x 36" W x 18³/₄" D. Changer compartment: 17" W x 16" D x 5³/₄" H. Mounting board is uncut and can be adjusted in height to accept all record changers sold by Heath; lid has adjustable friction-loaded support. **Record-tape recorder compartment:** 14³/₄" H x 17" W x 17¹/₄" D for record storage; space is convertible with accessory sliding drawer to accommodate tape recorder. **Shelf compartments:** Top shelf, 6³/₄" H x 17" W x 15⁵/₈" D. Middle shelf, 6" H x 17" W x 15⁵/₈" D. Bottom shelf, 9" H x 17" W x 17" D. Shelves accept any Heath stereo or mono tuner; stereo or mono combination amplifier.

[B] Matching Speaker Cabinet

MATCHES THE AE-13S EQUIPMENT CENTER IN STYLING, QUALITY AND FINISH. Handles 12 or 15 inch speakers, and has a 3³/₈" x 10³/₁₆" slot for horn tweeter. Tube-vented design allows simple cabinet-to-speaker matching—see opposite page for example. Completely factory assembled and finished. Measures 18¹/₄" W. x 18³/₄" D. x 28" H. Use of attractive spindle grille optional. Order a matching pair for stereo now!

Model AE-23S, 55 lbs. (REA Express or Motor Frt. Only) . . . no money dn., \$6 mo. . . each \$55.00



Matching Tape Recorder Drawer

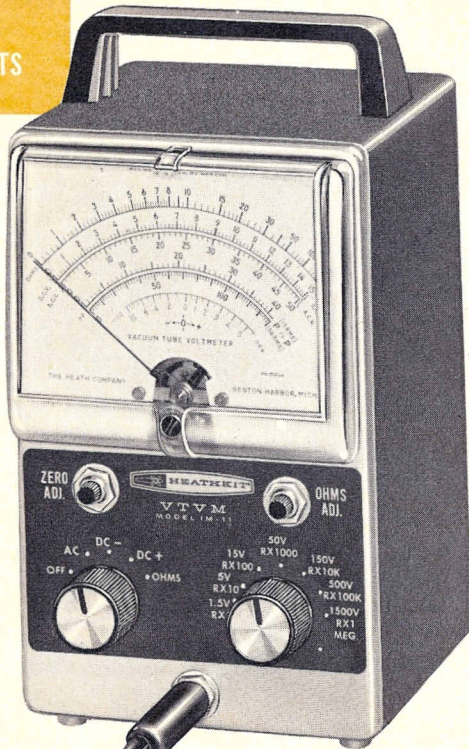
Designed to fit and match the AE-13S Early American equipment center above. Uncut. Dimensions: 7" H. x 16" W. x 16¹/₂" D., wood ¹/₂" thick. Note: Will not fit AD-16 recorder. See pg. 28 for special drawer provisions.

Model AEA-13-1, uncut recorder drawer, 16 lbs. \$20.00



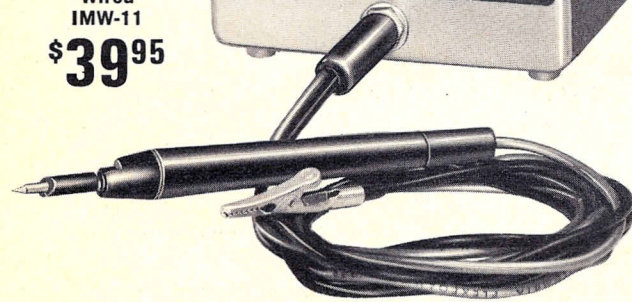
Heathkit® VTVM'S . . . The Standard

TEST
INSTRUMENTS



Kit
IM-11
\$24⁹⁵

Wired
IMW-11
\$39⁹⁵

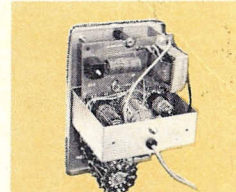


Heathkit IM-11 . . . The World's Most Popular VTVM



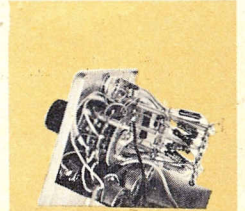
SINGLE PROBE CONVENIENCE

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



CIRCUIT BOARD ASSEMBLY

For uniformity and stability, as well as easy construction, the Heathkit IM-11 uses a printed circuit board for minimum component wiring.



PRECISION RESISTORS

The IM-11 voltage divider networks use precision (1%) resistors to provide high instrument accuracy.

• One probe makes all measurements • 7 AC, 7 DC, 7 Ohms ranges—scales are easy to read • Sensitive, high-quality 4½" 200 ua meter • 1% precision resistors • Extended frequency response ±1 db 25 Hz to 1 MHz • Measures RMS and Peak-to-Peak • Easy-to-build, electronically stable circuit board construction • Costs just 45c more than its predecessor of 16 years ago

Price Is Only One Of The Many Reasons For The Pace-Setting Leadership Of The IM-11. There's a big difference in performance too! . . . performance that has lead the industry for nearly two decades.

Chart The Course Of The Heathkit VTVM Throughout The Past 16 Years. To improve sensitivity, the meter movement was changed from 500 ua to 200 ua . . . the minimum voltage range was lowered from 3 volts to 1.5 volts. For an improved 4 volts peak-to-peak response, the half-wave rectifier was replaced with a voltage doubler. And circuit board construction now provides greater stability, easier assembly.

Examine The IM-11 More Closely. In addition to the improved features mentioned, functions include AC volts (RMS), AC volts (peak-to-peak), DC volts, resistance and decibel measurements. Precision 1% resistors and the high, 11 megohm input resistance assure high accuracy by

minimizing circuit loading of the unit under test. Front panel controls include a rotary function switch (with DC polarity reversing position to eliminate lead changing when alternately measuring positive & negative voltages), a rotary range selector, and Zero Adjust & Ohms Adjust controls.

What's More, The Single, Simple Plug-In Connector From Test Leads To Meter Is Designed With You In Mind . . . helps avoid tangled test leads . . . saves you time in changing 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 down, \$5 mo. **\$24.95**
Assembled IMW-11, 5 lbs. . . No money down, \$5 mo. **\$39.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices. See Page 65 for combination offer with EF-1 Applications Course . . . No money down, \$5 mo. **\$32.50**

IM-11 SPECIFICATIONS—Meter scales: DC & AC (RMS): 0-1.5, 5, 15, 50, 150, 500, 1500 volts full scale. **AC peak-to-peak:** 4.0, 14, 40, 140, 400, 1400, 4000. **Resistance:** 10 ohm center scale x1, x10, x100, x1000, x10k, x100k, x1 meg. Measures .1 ohm to 1000 meg-ohms. **Meter:** 4½" 200 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). **Tubes:** 12AU7, 6AL5. **Battery requirements:** 1.5 volt, size "C" flashlight cell. **Power requirements:** 105-125 volt 50/60 Hz AC, 10 watts. **Dimensions:** 7¾" H x 4-11/16" W x 4¾" D.



Kit 309-C
\$350

Kit 336
\$450

Etched Circuit RF Probe Kit

This handy RF probe may be used with any 11 megohm VTVM for RF measurements up to 250 MHz. All parts are mounted on a circuit board for high stability and ease of assembly.

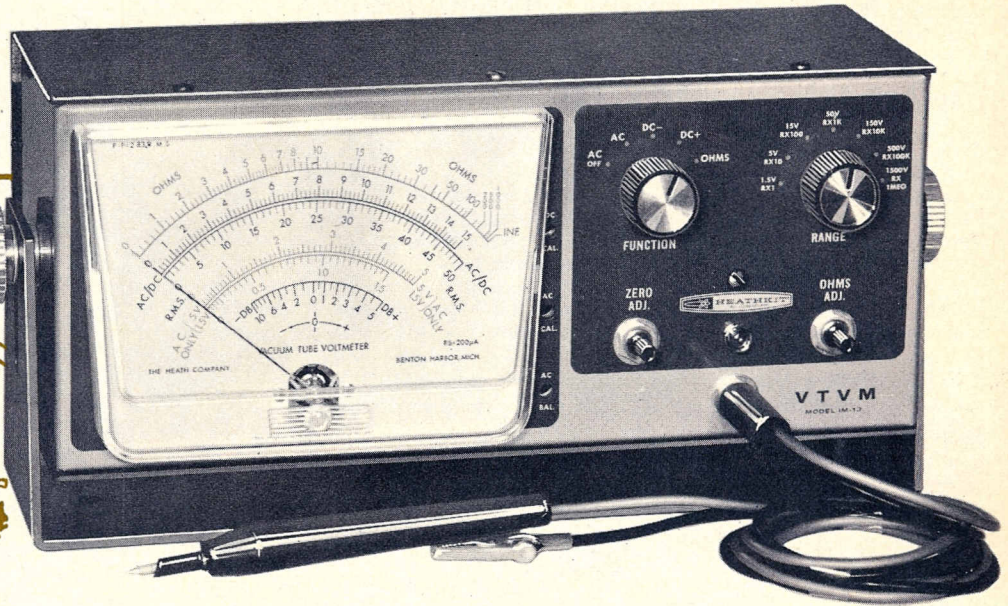
Kit 309-C, 1 lb. **\$3.50**
Assembled 309W-C, 1 lb. **\$4.50**

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 an 11 megohm input VTVM . . . provides a useful 1100 megohm input for measuring voltages as low as 50 volts in very high impedance circuits.

Kit 336, 1 lb. **\$4.50**
Assembled 336W, 1 lb. **\$5.50**

of Value For Two Decades



Heathkit Service Bench VTVM Especially Designed For Convenience, Accuracy, And Ease Of Use

Kit Wired
\$32⁹⁵ \$49⁹⁵

- Measures AC volts (RMS), DC volts, resistance & db • Separate 1.5 & 5 volt AC scales for high accuracy • Gimbal bracket for bench, shelf or wall mounting • Meter tilts to any angle for best viewing • Smooth vernier controls for zero & ohms adjust • Large, easy-to-read 6" 200 ua meter • Single AC/Ohms/DC test probe with switch • 1% precision resistors

IM-13 Features The Same High Performance Specifications As The IM-11, plus the 6" meter, extra low-voltage AC scales, gimbal mounting bracket, and "service bench" styling.

The IM-13 Is Engineered Right, Shaped Right, And Priced Right For Your "In-Shop" Servicing. Its compact cabinet is attractively and practically shaped to fit under, over, on-top-of, or just about anywhere around your bench. And for best viewing, the two thumbwheel nuts on the sides of the case allow meter tilting to any desired angle. The 200 ua meter is 6 inches large, easy-to-read, and has multi-colored meter scales with separate 1.5 & 5 volt AC scales . . . just a glance tells you correct scale and range in use for fast, accurate readings!

No More Confusing Tangle Of Test Leads. The IM-13 has a single test probe . . . simply adjust switch to measure AC/Ohms, or DC. And only one input jack connection is required for both test probe and ground leads. Test leads included. It's simple to operate, too. Just a function selector for measuring AC volts (RMS), DC volts, resistance and db . . . a selector for 7 ranges . . . and separate Zero and Ohms adjust

controls. All calibration controls are easily accessible from the front panel . . . no need to remove the case for future adjustments or calibration checks.

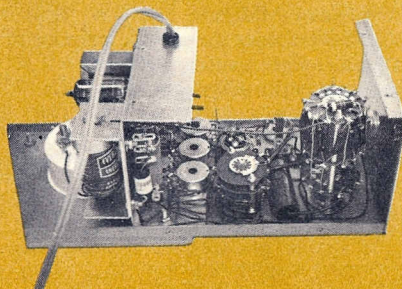
Available in Kit or Factory Assembled Form. No matter which version you choose, you enjoy big savings over comparable units. If you choose the IM-13 kit, you enjoy *extra* savings while having fun . . . the fun of "do-it-yourself." And with famous Heathkit step-by-step instructions and conventional wiring, your IM-13 goes together quickly and easily. The factory assembled IMW-13 is ready to go to work immediately . . . simply install the internal "ohms scale" battery and mount the gimbal bracket on your shop bench. When you choose a VTVM for your shop or lab, choose wisely . . . choose the Heathkit IM-13

Kit IM-13, 7 lbs. No money dn., \$5 mo. \$32.95
Assembled IMW-13, 7 lbs. . . . No money down, \$5 mo. \$49.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.
See Page 65 For Combination Offer with EF-1 Application kit.

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 ua movement. **DC Input resistance:** 11 megohms (1 megohm in probe) on all ranges. **AC Input impedance:** 1 megohm shunted by 40 uuf (measured at input terminals). **Circuit:** Balanced bridge (push-pull) using twin triode. **Accuracy:** DC $\pm 3\%$, AC $\pm 5\%$ of full scale. **Frequency response:** ± 1 db 25 Hz to 1 MHz (600 ohm source). **Tubes:** 12AU7, 6AL5. **Battery:** 1.5 volt size "C" flashlight cell (not supplied). **Power requirements:** 105-125 volts 50/60 cycle AC 10 watts. **Dimensions:** 5" H x 12-11/16" W x 4 3/4" D.

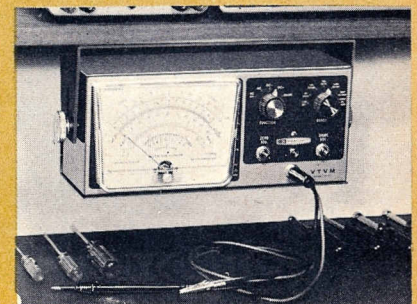
ROOMY LAYOUT PERMITS CONVENTIONAL WIRING

Neat, open circuit design permits fast, easy assembly. Note the high quality components used throughout for years of fine service.



SPACE SAVING CONVENIENCE

The IM-13 easily mounts under a shelf at eye-level reading position for greater convenience. Bracket holds meter securely in any position.



Heathkit Performance Specifications Are Guaranteed



Heathkit® Test Instruments . . . Quality,

Heathkit Laboratory AC VTVM . . . For Accurate AC Measurements

- Especially useful for low-level AC measurements • 10 voltage ranges—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 • Calibrated DB scale for audio measurements

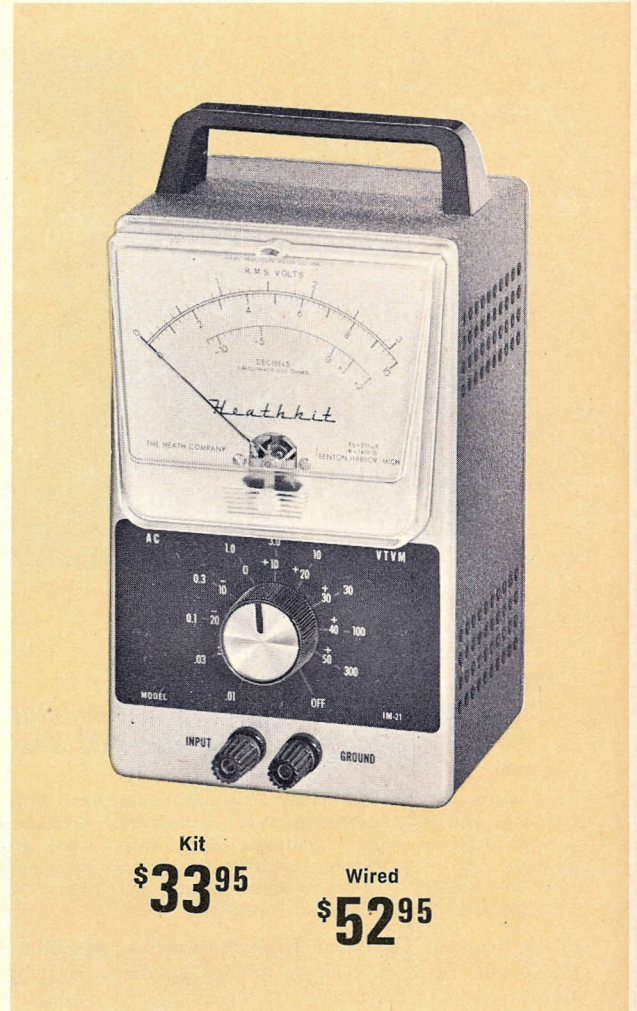
Here's A Compact Instrument For Accurate AC Measurement . . . features the same practical-size cabinet as the Heathkit IM-11 VTVM, plus precision components for extended accuracy in measuring AC voltages. A precision voltage divider provides 10 ranges, 10 millivolts to 300 volts RMS full scale . . . ideal for audio design and development work, laboratory use, or general servicing.

Features A Cathode Follower Input . . . with a 10 megohm input impedance for a minimum of loading on the circuit under test. The two-stage meter amplifier of the IM-21 includes a total of 19 db of negative feedback . . . assures high stability and high linearity. The IM-21 meter movement features VU-type ballistic damping . . . ideal for monitoring audio signals in servicing or R & D applications. 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.

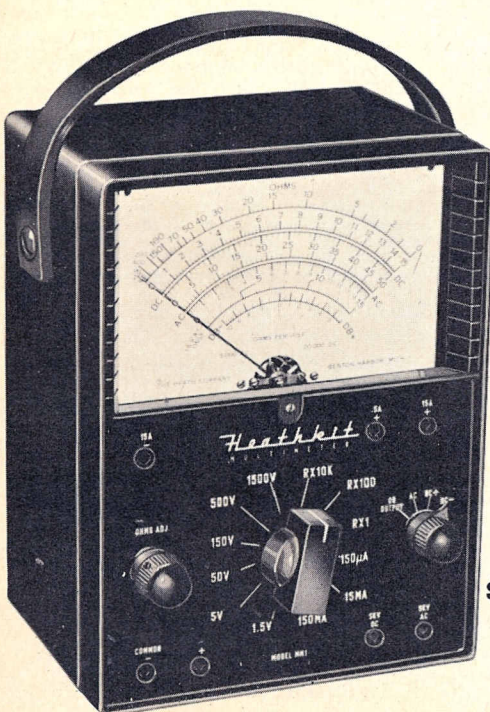
Practical Styling . . . not only compact in size and light in weight, but also easy to use. One knob controls "OFF" and the voltage range. The sturdy carrying handle is open, easy to grab . . . a real asset on the crowded service bench. And inside you'll find the highest quality components to give you years of reliable, trouble-free service, excellent stability, and repeatable accuracy. You'll enjoy assembling this instrument too. The styling inside is just as practical as the outside . . . clean, open parts layout . . . wiring that's easy to get at, easy to assemble.

Kit IM-21, 5 lbs. No money dn., \$5 mo. \$33.95
Assembled IMW-21, 5 lbs. No money dn., \$6 mo. \$52.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IM-21 SPECIFICATIONS—Frequency response: ± 1 db 10 Hz to 500 kHz, ± 2 db 10 Hz to 1 MHz, all ranges. Ranges: Ten ranges from 0.01 to 300 volts RMS full scale. Decibels: Total-range -52 to $+52$ 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: 7 $\frac{1}{2}$ " H x 4 $\frac{1}{16}$ " W x 4 $\frac{1}{4}$ " D.



Kit
\$33⁹⁵ Wired
\$52⁹⁵



MM-1
\$29⁹⁵

Heathkit VOM . . . Features 1% Precision Multiplier Resistors . . . Accurate 20,000 Ohm/Volt Circuit

- Sensitive 50 microampere 4 $\frac{1}{2}$ " meter • Total of 35 meter ranges • 2-color scale • All 1% precision multiplier resistors for high accuracy • Polarity reversing switch—eliminates transferring test leads • Recessed test jacks—carrying handle

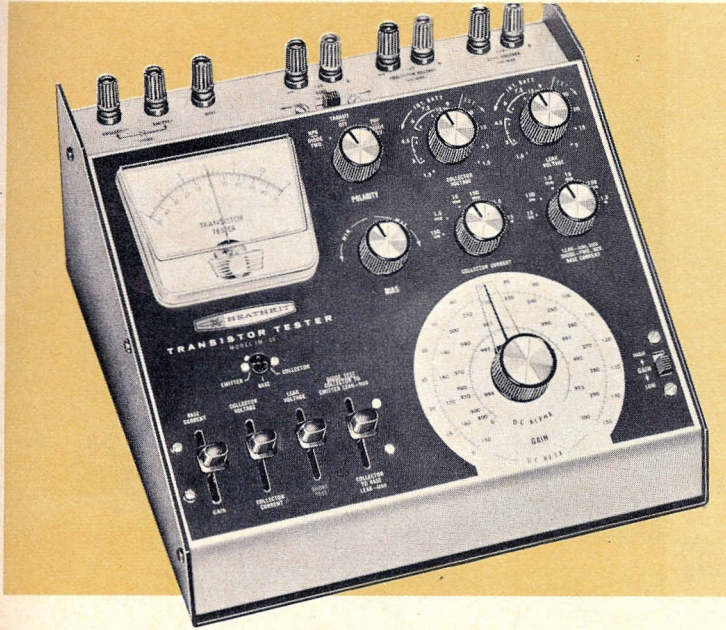
1% Precision Resistors For Maximum Accuracy . . . the selection of quality components assures you of an accurate, dependable test instrument. The large 4 $\frac{1}{2}$ " meter with 50 microampere movement has more than enough sensitivity for even the lowest voltages on the 1.5 volt scale—a single volt on the lowest range produces a meter deflection of 2 $\frac{1}{4}$ ".

The Self-Contained 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. It's easy to use. The polarity reversing switch eliminates the need to transfer test leads when alternately measuring positive and negative voltages. The test jacks are recessed to minimize shock hazards during tests with high voltage. And the internal batteries are inexpensive, easy-to-replace standard flashlight cells (not included).

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, 50, 150, 500, 1500, 5000. Direct current: 150 microamperes, 15, 150, 500 milliamperes, 15 amperes. Ohmmeter: 0.2 ohms to 20 megohms in three ranges. Decibels: -10 to $+65$ db. Resistors: 1% precision type. Accuracy: $\pm 3\%$ of full scale. Controls: Range switch, Output, AC, DC, Reverse DC switch, Ohms adjust control. Batteries: 1 type "C" cell, 4 penlight cells. Dimensions: 7 $\frac{1}{2}$ " x 5 $\frac{1}{2}$ " x 4".

Dependability, Accuracy . . . Up To 50% Savings

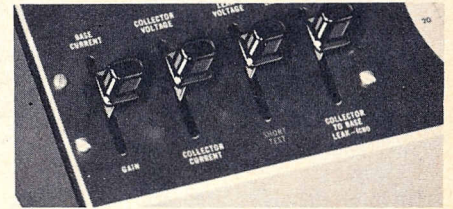


Heathkit Laboratory Transistor Tester Performs Detailed Transistor Analysis

Kit
\$54⁸⁸
Wired
\$84⁹⁵

- Unmatched in quality, performance and price!
- Ideal for servicing, design work, incoming inspection, production testing, etc.
- Provides complete DC analysis of PNP & NPN transistors
- DC gain (Beta, Alpha) read direct on calibrated scales
- 15 uA basic range for leakage (Icbo, Iceo) tests
- Four lever switches for fast, easy test selection

Fast Test Selection
Four lever switches provide simple selection of any test available after initial setting of the current and voltage range switches. Binding post terminals are provided for transistors that do not fit tester socket.



Heathkit IM-30 Brings You Complete Laboratory Facilities For Transistor Analysis . . . enables thorough testing of transistor and diode characteristics, including base current, gain, collector current, collector voltage, diode or collector-to-emitter leakage (Iceo), and collector-to-base leakage (Icbo). Ideal for use in servicing when equivalent transistor types must be chosen . . . perfect for classroom, laboratory, or industrial shop where design requirements demand complete analysis.

Operation Is Simple! Four lever switches instantly select the desired test on any transistor or diode after initial setting of the voltage and current range switches. Separate voltage and current range switches for both Gain and Leakage settings allow tests of transistors under a wide variety of different conditions. DC Beta (0-150, 150-300) and DC Alpha are read directly on the calibrated Gain scale on

the front panel after the meter is nulled. A 3% wire-wound potentiometer assures continued high accuracy.

Internal Battery Supply. All basic tests provided by the IM-30 may be performed with the internal battery power supply which provides any test voltage up to 9 volts in 1.5 volt steps. Provision is also made for the use of an external DC power supply for checks of transistors at higher voltages and current. Appropriate meter ranges for voltage and current are included in the design of the IM-30 for this purpose. A variable bias control allows setting of collector current to any desired value up to 15 amperes for gain tests.

Neat, Functional Styling. The sloping front panel of the IM-30 permits convenient, easy reading of meter and dial scales. Front panel is attractively finished in charcoal-grey with high-contrast white panel screening and red calibration marks. An exceptional value in

transistor testing facilities. Less batteries.

Kit IM-30, 9 lbs. No money dn., \$6 mo. **\$54.88**
Assembled IMW-30, 10 lbs. No money dn., \$9 mo. **\$84.95**

IM-30 SPECIFICATIONS—Checks: Transistors up to 15 amps and diodes up to 1.5 amps. **Tests:** Shorts, DC Gain (Beta 0-300) (Alpha 0-.9967), Leakage (Icbo, Iceo), Diode Forward and Reverse Current. **Meter:** Current Ranges: 15 uA, 150 uA, 1.5 mA, 15 mA, 150 mA, 1.5 A, 15 A; Voltage Ranges: 1.5 V, 5 V, 15 V, 50 V, 150 V (100 K ohm/volt). **Power supply:** Internal, seven 1.5 volt size D batteries provide 1.5, 3, 4.5, 6, 7.5, 9 volts collector supply for gain or leakage and 1.5 volts for bias; External, 0-50 volts for gain, 0-150 volts for leakage and 0-5 volts for bias. **Bias control:** Permits any collector current from 10 uA to 15 amps for gain tests. **Gain control:** 3% wire-wound potentiometer has calibrated scales to give DC Beta and DC Alpha 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 Voltages can be individually preset at different voltage levels. **Two current range switches:** Collector and Leak currents can be individually preset on different ranges. **Transistor and diode connections:** Universal transistor socket and binding posts. **External power supply connections:** Binding Posts for Gain, Leak and Bias supplies.

Handy Heathkit Transistor/Diode Checker . . .

Satisfies Most Service Needs

- Tests low and high power transistors
- Tests forward and reverse current of diodes
- Operates on two standard size "C" flashlight batteries
- Easy to assemble, easy to use

The tremendous advances in transistor technology and the great number of transistorized units on the market today call for a simple, reliable tester that will help speed servicing and testing operations. The compact size and versatile operation of the IT-10 make it an ideal instrument for use on the test bench or on service calls . . . fits easily into tool box, glove compartment of car or truck, etc., and is ready to serve in an instant. No external power required . . . operates on two standard size 1.5 volt "C" flashlight batteries for complete portability.

Provides All Necessary Servicing Checks. The Heathkit IT-10 checks transistors and diodes for shorts, leakage, open element, and current gain. Handles both low and high-power transistors. Versatile switching accommodates PNP or NPN type transistors and eliminates any need for transferring test leads during diode tests. Removable test leads are provided for checking transistors which do not fit the tester socket, and for making general continuity checks. Batteries not included.

Kit IT-10, 2 lbs. **\$6.95**

IT-10 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. **Dimensions:** 3 1/4" H x 3 1/4" W x 3 1/4" D.



IT-10
\$6⁹⁵

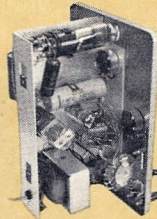


TEST
INSTRUMENTS

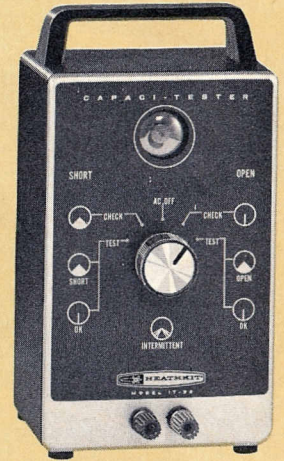
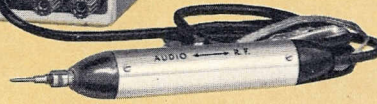
Engineered For Quality... Priced For



IT-11
\$29⁹⁵



IT-12
\$19⁹⁵



IT-22
\$10⁹⁵

Heathkit Capacitor Checker A Direct-Reading Bridge

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

Completely Analyzes Capacitors . . . quickly, efficiently, and accurately. Provides all the data you need for circuit design, production testing, or servicing requirements. The IT-11 assembly manual thoroughly discusses measurement techniques, plus gives procedure for quick, easy capacitor check-out.

All Measurements Are Made On Direct-Reading Scales. No involved calculations required! Measures resistance from 5 ohms to 50 megohms in 3 ranges, capacitance from 10 μf to 1,000 μf in 4 ranges. Leakage and shorts are immediately detected by an "eye" tube indicator. 16 leakage testing voltages and 3 leakage sensitivities allow testing of capacitors at their rated values. A unique "leakage" test switch automatically discharges capacitors after test, to eliminate shock hazard to the operator. Order your Heathkit IT-11 now for faster, easier servicing!

Kit IT-11, 7 lbs. . . .
No money down, \$5 mo. \$29.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IT-11 SPECIFICATIONS—Test circuit: AC bridge, powered through special bridge transformer by an internal 60 Hz supply or by an external audio generator with 10 volts output. Upper frequency limit: 10 kHz. **Capacitance, 4 ranges:** 10 μf to .005 μf ; .001 μf to .5 μf ; .1 μf to 50 μf ; 20 μf to 1000 μf . **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 volts AC, 50/60 Hz, 30 watts. **Dimensions:** 9 1/2" high x 6 1/2" wide x 5" deep.

Heathkit Visual-Aural Signal Tracer Makes Fast Work Of Trouble-Shooting AM Circuits

- 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 utility amplifier or test speaker • Ideal for safe testing of transistor circuits

Fast, Effective Means For Tracing Signals . . . checks RF, IF, and audio stages quickly to isolate the defective stage. Signals are traced visually with an electron-eye tube indicator and audibly with a built-in speaker. Both audio and RF inputs are handled by one convenient probe with switch selection for either input.

Enables Safe Testing Of Transistorized Equipment. Sensitive transistor circuits, easily damaged through ordinary testing procedures, can be safely tested, since no voltage is applied through the test probe. The minute signals of microphones, instrument pickups, etc. can be checked out, since the IT-12 features a high-gain amplifier with adjustable level control. Speaker and output transformer are also available for substitution tests. The many features of the IT-12 make it an extremely worthwhile investment in time-saving test facilities.

Kit IT-12, 6 lbs. \$19.95
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:** 3 1/2" PM. **Probe and test leads:** 4' input lead for RF and audio with switch on probe body, 2-3' panel test leads with alligator clips. **Dimensions:** 4 1/2" W x 7 1/2" H x 4" D.

Heathkit "Capaci-Tester" Makes "In-Circuit" Capacitor Checks

- Spots open, shorted or intermittent capacitors without removing them from the circuit • Fast & simple to use • Built-in self-testing feature • Small, compact size—easy to carry

Saves Valuable Time In Trouble-Shooting Circuits. With the Heathkit "Capaci-Tester" most capacitors can be tested for "open" or "short" condition right in the circuit, without disconnecting leads, saving both time & effort in servicing.

Locates Hard-To-Find Intermittent Components. Intermittent capacitors cause the "eye" tube to flicker, assisting greatly in the location of erratic and troublesome components. The IT-22 also detects "open" capacitors from 50 μf up, not shunted by an excessively low resistance value and "shorted" capacitors up to 20 μf shunted by not less than 10 ohms.

Tests Bypass, Blocking, And Coupling Capacitors. Fast and easy checks can be made of all paper, mica, and ceramic capacitors used in these applications. Oscillator is built-in . . . uses a 60 Hz signal for "short" test, and a 19 MHz signal for "open" test.

Self-Testing . . . Easy To Use. A single five-position switch on the front panel controls the power to the instrument, selects the desired test and permits check of instrument performance.

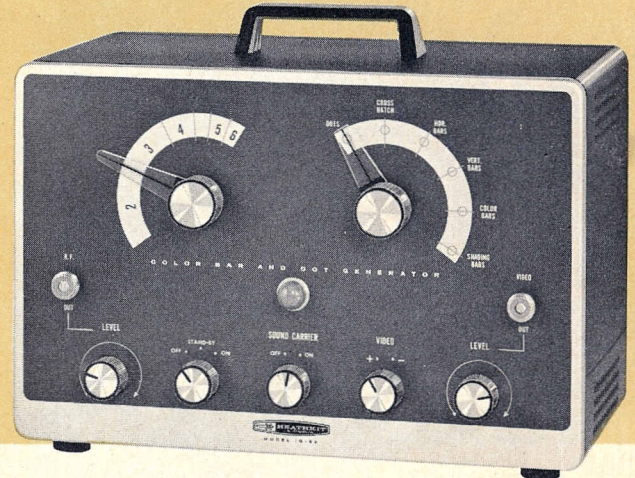
Kit IT-22, 4 lbs. \$10.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IT-22 SPECIFICATIONS—Range: Open Test, 50 μf to infinity, shunted by more than 2 K ohms at 50 μf , 400 ohms at 100 μf , 30 ohms at 350 μf or more. Short test, up to 20 μf shunted by at least 10 ohms. **Test frequencies:** Short test, 60 Hz. Open test, 19 MHz. **Power requirements:** 105-125 V., 50-60 Hz AC, 5 watts. **Cabinet size:** 7 3/8" H x 4 1/16" W x 4 1/8" D.



IG-52
\$67⁹⁵

IG-62
\$64⁹⁵



Heathkit TV Alignment Generator . . . Provides All Essential Facilities For FM & TV "Front End" And IF Alignment

- FM & TV coverage—Sweep oscillator covers 3.6 MHz to 220 MHz with 0-42 MHz max. sweep width • Stable, all-electronic sweep circuit • Built-in marker oscillators—4.5 MHz crystal & 19 to 60 MHz variable (57 to 180 MHz on harmonics)

A Favorite Among TV Technicians Nationwide! 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 receivers and TV receivers (TV front end channels from 2 through 13).

Unique Design Features. A trouble-free 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 oscillator fundamentals (3.6 to 220 MHz) eliminating troublesome beats and parasitics such as those encountered in beat-frequency type generators. Sweep is smoothly controllable from 0 to as high as 42 MHz (depending upon center frequency).

Fixed-Step And Variable Attenuators. Full control of RF output permits 0.1 volt output for "cold" alignment of tuned circuits, plus attenuated outputs for alignment capability of high-gain stages without danger of overloading.

Crystal And Variable Marker Oscillators Are Built-In. A 4.5 MHz crystal (included with kit) provides an output at 4.5 MHz and multiples thereof. It is also used to calibrate the built-in variable marker oscillator. Marker pip amplitude is individually panel controlled. An external generator may be used with the internal markers to provide three or more simultaneous pips on the waveform.

Increase Your TV Service Profits Now! Order your Heathkit IG-52 today for accurate, dependable test facilities at "big" savings!

Kit IG-52, 14 lbs. . . No money down, \$7 mo. \$67.95
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.

Heathkit Color Bar & Dot Generator . . . Unsurpassed In Performance And Price

- Produces six different patterns for picture adjustment • 10 vertical color bars—including a special shading bar pattern
- Crystal controlled for accuracy & stability • Both RF and Video output for maximum versatility

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!

Choice Of Six Different Patterns. Patterns include: white dots, cross-hatch, vertical bars, horizontal bars, 10 vertical color bars and a special shading bar pattern for screen and background adjustments to achieve proper gray-scale tracking. Color bars produced by the offset carrier method allow AFC, phase and matrix alignment, and are provided with a white leading edge and 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. Your IG-62 will offer you performance and versatility that will be appreciated for years to come.

Kit IG-62, 13 lbs. . . No money down, \$7 mo. \$64.95
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.

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.



TEST INSTRUMENTS

Heathkit® Signal Generators . . . Preferred

Heathkit FM Stereo Alignment Generator For RF, IF, And Multiplex Alignment Of FM Receivers

IG-112
\$99⁰⁰



- Fills every FM alignment need • Produces virtually all signals required for trouble-shooting and alignment of multiplex adapters, FM tuners & 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 & 65 kHz or 67 kHz SCA signals for complete alignment capability • 100 MHz sweep signal (adjustable ± 2 MHz) for overall RF & IF alignment on clear portion of FM band • Built-in crystal controlled marker oscillator for I.F. and dial tracking checks • Phase test for accurate adjustment of subcarrier transformers • No balance adjustment required for equal right and left channel modulation levels

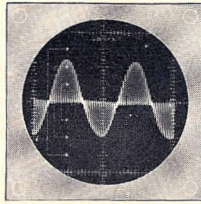
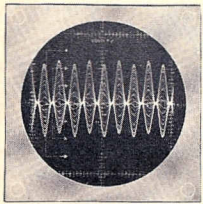
All The Facilities You Need For Fast, Easy Alignment Of FM and FM Stereo Equipment. Signals produced by the Heathkit IG-112 include an audio or composite stereo signal for multiplex adapter adjustments . . . an RF carrier modulated by these signals for tuner and receiver adjustments . . . a "phase test" 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.

Many Extras For Versatile Operation. Instant selection is made for either right or left channel signals and the special "phase test" on the front panel with no balancing required for equal right and left channel modulation level. Switch selected frequencies for either direct or RF modulation use include 400 Hz, 1000 Hz, 5000 Hz, 19 kHz, 38 kHz, and two special SCA (subscription service) frequencies (65 kHz or 67 kHz), to provide a versatile system capable of aligning even the most advanced-design tuners.

Easy To Use. RF signals supplied by the generator terminate at a 300 ohm balanced output designed for direct connection to the antenna terminals of the unit being tested . . . no complicated matching networks for impedance or balance required. A three-step (20 db per step) RF attenuator prevents overloading of tuner input. The IG-112 is complete with test leads and detailed stereo alignment instructions. Order your Heathkit FM Stereo Generator for faster, easier servicing, and greater profits through this rapidly growing field.

Kit IG-112, 11 lbs. No money dn., \$10 mo. \$99.00
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IG-112 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: 19 kHz pilot level control, deviation-sweep width-composite level-audio level control, function switch, frequency switch, & 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 volts AC, 50/60 Hz, 35 watts. Dimensions: 10 1/4" H x 8" D x 13" W.



It's Easy To Align This Generator

Scope photo shows one of the waveforms produced by the generator during initial generator alignment. This and other photos are included in the manual so that no equipment other than a low-cost oscilloscope and AC VTVM are required to align the generator for accurate results.

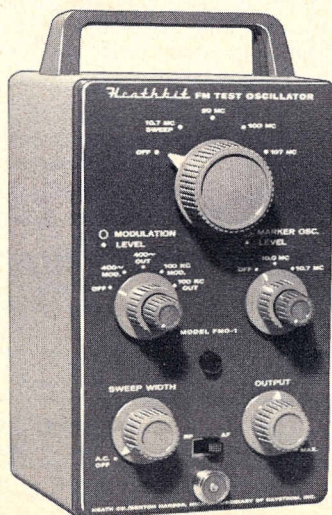
Composite Stereo Waveform

Actual scope pattern photo shows the composite stereo waveform produced by the generator for use in adjusting FM stereo tuners and receivers for equal left and right channel output. This waveform also allows adjustment of subcarrier transformers, balance & phase controls, etc.

Heathkit FM Alignment Generator

- Provides all essentials for fast, easy alignment of FM RF & IF circuits • 10.7 MHz sweep, sweep width variable 200 kHz to over 1 MHz • Switch-selected 90, 100, & 107 MHz signals • 100 kHz bandwidth markers for checking bandpass

FMO-1
\$34⁹⁵



A Compact Signal Generator For FM Alignment . . . the FMO-1 provides 10.7 MHz sweep width (variable from 200 kHz to over 1 MHz) with a stable crystal-controlled center marker and 100 kHz submarkers for IF alignment. Convenient switch selection of 90, 100, and 107 MHz signals permits fast, easy circuit alignment and quick service checks or re-alignment of dial calibration.

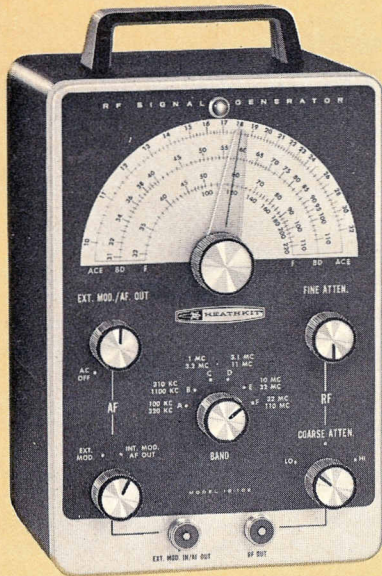
Designed To Meet Your Service Requirements . . . the crystal marker and 100 kHz marker/audio oscillators have their own level controls, and all signals feed through a master output control. A pod is provided on the end of the test cable to provide proper cable termination.

Accurate Receiver Alignment Is Assured . . . through the comprehensive instructions for step-by-step assembly and tune-up of your FMO-1 . . . plus, detailed instructions on FM alignment are included in your assembly manual.

Kit FMO-1, 5 lbs. . . No money down, \$5 mo. \$34.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

FMO-1 SPECIFICATIONS—RF alignment output: 90, 100 and 107 MHz switch-selected. Modulation: 400 Hz incidental FM. For IF and detector alignment: 10.7 MHz sweep. Sweep width: 200 kHz to over 1 MHz. Markers: 10.7 MHz (crystal); 100 kHz submarkers. Modulation: 400 Hz AM. Other outputs: 10.0 MHz (crystal) and harmonics; 100 kHz and 400 Hz audio. Tube complement: (2) 6U8. Power supply: Transformer, silicon rectifier. Power requirements: 105-125 V, 50/60 Hz, 12 watts. Cabinet size: 7 3/8" H x 4 3/4" W x 4 3/8" D.

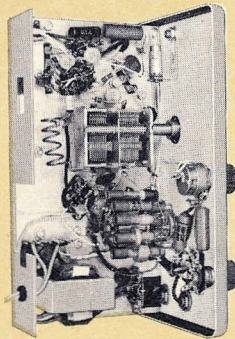
By Service Technicians, Engineers, And Teachers



Kit
\$27⁹⁵

Wired
\$54⁹⁵

Factory Aligned Coils
Coil and band switch assembly, aligned to factory precision standards, assures accurate calibration of your completed instrument.



Heathkit General Purpose RF Signal Generator ... Ideal For The Service Shop ... Berkeley Physics Laboratory Version Available

- Covers 100 kHz to 220 MHz in six bands • Large accurately calibrated dial scales • Factory wired and aligned coil and band-switch assembly • Modulated or unmodulated RF output • 400 Hz signal modulation and 400 Hz audio output for audio tests • High-level "RF Direct" output on Berkeley Physics Laboratory version

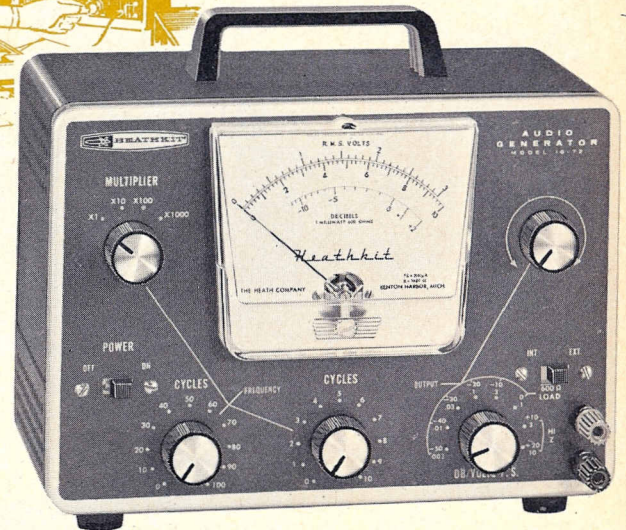
The Specifications Speak For Themselves! The IG-102's 100 kHz to 220 MHz tuning range and 2% tuning accuracy have made it widely chosen for a laboratory RF signal source, as well as for the service technician's accurate, dependable test instrument. The versatility of the IG-102, plus its low price have put it into thousands of service shops the world over. The ease of assembly and additional manual entitled "How To Understand And Use Your Signal Generator" (See EF-3, page 65) have made this a favorite kit with the hobbyist just beginning radio repair.

Modulated Or Unmodulated RF Output is available at up to 100,000 microvolts, controlled by both fixed-step and variable output attenuators. Internal modulation is 400 Hz, and provision is made for external modulation at other frequencies. The 400 Hz signal with 10 volt output is available separately for audio tests.

The Berkeley Physics Laboratory Version (IG-102S) ... features the additional direct RF output jacks necessary for the course experiments and a 3% tuning accuracy characteristic of the modified instrument. (Caution! This version of the instrument is not suitable for radio and TV servicing, since high-level RF output radiates into receiver circuitry.) 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. **\$27.95**
 - Assembled IGW-102, 7 lbs. No money dn., \$6 mo. **\$54.95**
 - IG-102S, Educational Model, 7 lbs. **\$30.00**
 - IGW-102S, Assembled Educational Model, 7 lbs. **\$60.00**
- Export model available for 115/230 VAC, 50-60 Hz; write for prices.

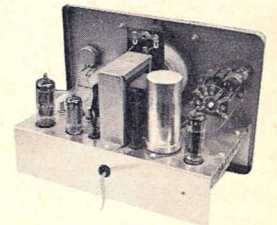
IG-102 SPECIFICATIONS—Frequency range: Band A, 100 kHz to 320 kHz; Band B, 310 kHz to 1.1 MHz; Band C, 1 MHz to 3.2 MHz; Band D, 3.1 MHz to 11 MHz; Band E, 10 MHz to 32 MHz; Band F, 32 MHz to 110 MHz. **Calibrated harmonics:** 100 MHz to 220 MHz. **Accuracy:** 2%. **Output:** Impedance, 50 ohms; Voltage, 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:** 6 1/2" W x 9 1/2" H x 5" D.



Kit
\$41⁹⁵

Wired
\$64⁹⁵

Precision Components
200 uA meter plus precision resistors in "cycle" switches contribute to the high accuracy of the completed instrument.



Heathkit Switch-Selected Audio Generator Provides Near-Perfect Sine-Wave Signals

- A near-perfect output signal—ideal for servicing or troubleshooting high-fidelity equipment • Switch-selected output frequencies—10Hz to 100 kHz • Less than 0.1 of 1% distortion—20 to 20,000 Hz • Panel metered output is calibrated in volts & db • Output level and frequency accurate to within ± 5%

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!

Less Than 0.1 Of 1% Distortion Throughout The Audible Range! ... with an over-all tuning range of 10 Hz to 100 kHz at ±5% accuracy. Those are the hard and fast specifications of the IG-72. Plus, switch-selected one-Hertz steps from 10 to 100Hz, 10 db steps in the output attenuator with a "fine" adjustment on each range, and metered output to internal or external 600 ohm loads. Order The IG-72 For Precision Electronics At A Price You Can Afford.

- Kit IG-72, 8 lbs. No money dn., \$5 mo. **\$41.95**
 - Assembled IGW-72, 9 lbs. No money dn., \$7 mo. **\$64.95**
- Export model available for 115/230 VAC, 50-60 Hz; write for prices.

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

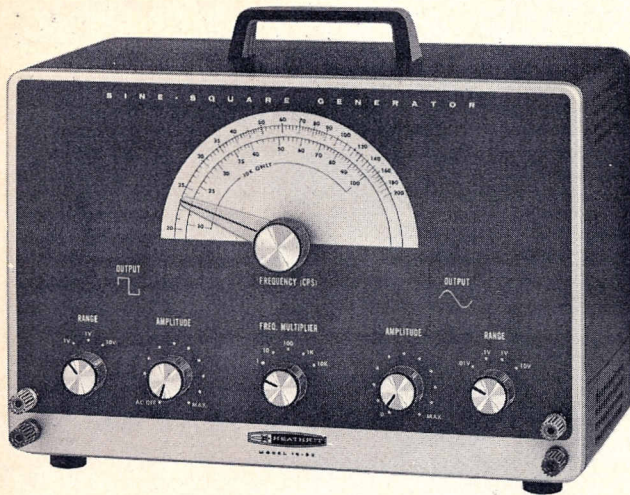
Heathkit Performance Specifications Are Guaranteed



TEST
INSTRUMENTS

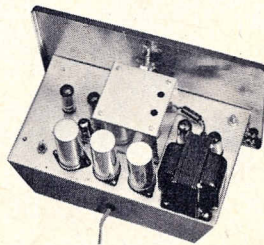
Save Up to 50% On Instruments For

Heathkit Sine-Square Wave Generator A General Purpose Instrument With Wide Frequency Range



IG-82
\$51⁹⁵

Extra-Value Design means better performance. Shielded tuning capacitor and frequency multiplier switch—conservatively rated power transformer—silicon diode rectifiers—simplicity of circuitry—all contribute to high quality waveforms.



- Covers 20 Hz to 1 MHz in 5 bands . . . from bottom of audio band to half way through the broadcast band
- Less than .25% sine wave distortion
- Less than .15 microsecond square wave rise time
- Sine and square wave output available simultaneously

Produces Research-Quality Sine & Square Wave Signals . . . for audio, TV, high-fidelity, and educational laboratory testing. Sine waves are within 0.25% of perfect sinusoidal waveforms . . . square waves are clean, free from spurious spikes, and have rise times better than 0.15 microseconds. Both the sine and square wave outputs may be used separately or simultaneously without affecting either waveform. Separate output terminals and attenuators permit individual control.

Output Attenuators Operate In Steps Of 10, 1, And .1 Volts For Both Sine And Square Wave. And an extra range of .01 volt is provided for sine wave. The oscillator circuits are well-shielded, and a special control compensates for differences in tube characteristics during initial calibration to assure absolute minimum distortion. Also featured is an exact frequency calibrating system to insure proper tracking across the dial. Sine wave output impedance is 600 ohms, and square wave output impedance is 50 ohms at all settings on the output controls, except in 10 volt (Hi-Z) ranges.

This attractively styled generator is "Heath-Engineered" throughout for maximum efficiency, ease of assembly, and dependable performance.

Kit IG-82 . . . 14 lbs. . . No money down, \$6 mo. **\$51.95**
Assembled model EUW-27, 14 lbs. . . (REA Express or Motor Frt. only)
No money down, \$10 mo. **\$94.00**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IG-82 SPECIFICATIONS—SINE WAVE: Frequency range: 20 Hz to 1 MHz. Output volts (RMS): 0 to 10 volts, 0 to 1 volt, 0 to .1 volt, or 0 to .01 volt when working into a high impedance load. Source impedance: ($\pm 10\%$): 10 volt range, 0 to 3.5 k ohm; 1V, .1V and .01V range, 600 ohm. Distortion: Less than .25%, 20 to 20,000 Hz. Frequency response: ± 1.5 db 20 Hz to 1 MHz. **SQUARE WAVE:** Frequency range: 20 Hz to 1 MHz. Output volts: (P. to P.) $\pm 5\%$ 0 to 10 volt, 0 to 1 volt, 0 to .1 volt, into a high impedance load. Source impedance: ($\pm 10\%$): 10 volt range, 0 to 220 ohm; 1V and .1V ranges, 52 ohm. Rise time: less than .15 microsecond. **GENERAL:** Frequency accuracy: $\pm 5\%$. Power requirements: 105-125V AC, 50/60 Hz, 55 watts. Dimensions: 13" W x 8 1/2" H x 7" D.

Heathkit Laboratory RF Generator Provides Precision-Attenuated RF Signals



IG-42
\$56⁹⁵

- Metered output voltage and % modulation
- Operates on fundamentals -100 kHz to 30 MHz in five bands
- Double shielding of all oscillator circuits
- Easy to build with point-to-point wiring

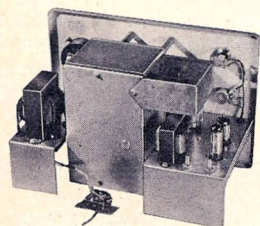
Especially Valuable For Its Wide Range Of RF Signal Amplitudes . . . the Heathkit IG-42 Laboratory RF Signal Generator is the perfect instrument to be used for the development of "front-end" circuitry, or for trouble-shooting high-gain RF circuits. Its output is 100,000 microvolts with switch-step attenuation in factors of 1, 10, 100, 1000, & 10,000, and with variable attenuation at a 10:1 factor, maximum. Effective use of internal shielding assures that the metered output level is accurate and free from spurious radiation. The IG-42 includes a 400 Hz signal source for 0 to 50% modulation of the output signal, and can be modulated by external sources from 60 to 10,000 Hz.

Well-Designed Throughout. The power supply is transformer operated for safety and high efficiency . . . features generous filtering and voltage regulation for stable, noise-free output signals. The generator output impedance is 50 ohms, and the terminating resistor, located in the plastic pod at the end of the coaxial cable, is easily changed for specific impedance requirements.

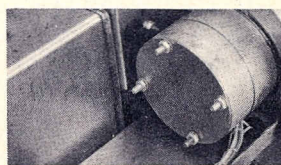
Your IG-42 is engineered to go together quickly, easily . . . to provide you with the versatility and performance you need to carry out effective and efficient laboratory design work . . . to give years and years of reliable service . . . and to save you hard-earned dollars. When choosing test instruments for your lab, choose wisely with the Heathkit IG-42.

Kit IG-42, 15 lbs. . . No money down, \$6 mo. **\$56.95**
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 31 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 8 1/2" H x 7" D.



Extensive Shielding
Compartmentalized chassis construction effectively isolates critical stages and prevents spurious radiation.

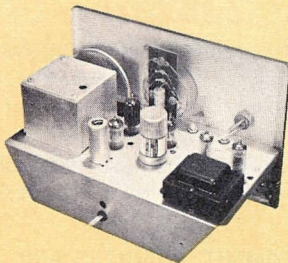


Shielded Step-Attenuator
Complete shielding between switch wafers as well as external shield cover assures non-interaction, true attenuation.

Use Heath's Technical Consultant Service—Just Drop Them A Line On Any Kit Subject



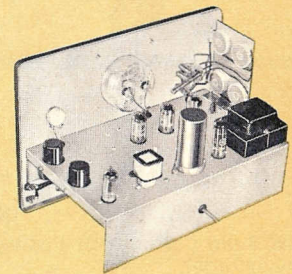
IM-12
\$54⁹⁵



Quality Design
Shielded tuning capacitor in the Wien Bridge circuit. Two-stage amplifier volt-meter circuit. Transformer operated power supply, voltage regulated.



IM-22
\$56⁹⁵



Superior Components
Potted Hi-Q inductances for hi-pass and low-pass filter circuits. Special oscillator coil for low-distortion, high frequency oscillator signal. Non-inductive load resistors.

Heathkit Harmonic Distortion Meter For Accurate Analysis Of Hi-Fi Equipment

- Measures harmonic distortion as low as 1% full-scale from 20 to 20,000 Hz • Meter scales calibrated in volts RMS, % distortion, and db • Measures noise levels down to -60 dbm
- Quality components for precision measurements • Easy to assemble and operate

Simple To Use, High Quality, Low Cost. Resourceful engineering, traditional in Heathkit test equipment, has reduced the highly complex and costly equipment required for harmonic distortion measurements to a simple-to-use, low-cost instrument . . . without sacrificing accuracy, stability, or quality.

When used with an audio generator such as the Heathkit IG-72 or IG-82, this superb unit will accurately measure harmonic distortion at any frequency between 20 and 20,000 Hz. Indicates the residual signal in an amplifier under test, after the fundamental frequency is eliminated, to give an accurate reading of hum, noise and harmonic distortion. Distortion is read directly on the meter in ranges of 0-1, 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 circuit assure excellent sensitivity and high accuracy.

Easy To Build . . . Easy To Buy. Your IM-12 is designed to go together quickly and easily, provide you with years of faithful service, and save you many dollars over comparable units.

Kit IM-12, 13 lbs. . . No money down, \$6 mo. \$54.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IM-12 SPECIFICATIONS—Frequency: 20 Hz to 20,000 Hz in three ranges. **Distortion:** 1, 3, 10, 30, 100% full scale. **Voltmeter:** 1, 3, 10, 30 volts full scale. **Input resistance:** 300 k ohm. **Minimum input voltage for distortion measurements:** 0.3 volts. **Output voltage for monitoring:** 2.5 volts at full scale meter reading. **Accuracy:** Voltmeter, $\pm 5\%$; Distortion, $\pm 5\%$ of full scale. **Tube complement:** OA2, 6X4, 58Y9, 12AT7, 12AX7, 12BY7. **Power requirements:** 105-125 V, 50/60 Hz AC, 30 watts. **Dimensions:** 13" W x 8 1/2" H x 7" D.

Heathkit Audio Intermodulation Analyzer 3 Audio Test Instruments In One

- Considerable savings over 3 separate instruments • Combines function of AC VTVM, Wattmeter & IM Analyzer • Built-in high and low frequency sources for IM tests • Built-in load resistors for 4, 8, 16 and 600 ohms • Large easy-to-read meter—simplified switching system

All The Facilities You Need For Complete and Thorough Intermodulation Distortion Analysis Of Stereo And Monaural High Fidelity Equipment. The compact, easy to use Heathkit IM-22 performs all the basic functions with a unique built-in switching system that allows use of any portion of the instrument separately, or combines its functions internally for simple operation . . . eliminates a bench-top cluttered with instruments . . . no more confusing mass of interconnecting test leads.

Greater Operating Convenience. Built-in, non-inductive load resistors and high impedance position for stage-to-stage and other circuit analysis. Built-in 6 kHz and 60 Hz frequency sources for IM tests . . . no additional equipment is required. And your IM-22 assembles easily . . . provides you with stable, trouble-free service . . . presents a substantial savings over the cost of buying all three separate units. If you service audio gear in your shop, choose this handy 3-in-1 analyzer now.

Kit IM-22, 13 lbs. . . No money down, \$6 mo. \$56.95
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. **Range AC VTVM:** .01, .03, .1, .3, 1, 3, 10, 30, 100, 300 volts RMS full scale. **DBM:** -40, -30, -20, -10, 0, +10, +20, +30, +40, +50. Reads from -65 to +52 dbm. **Wattmeter:** 0.15 mW, 1.5 mW, 15 mW, 150 mW, 1.5 W, 15 W, 150 W, full scale. Maximum continuous power 25 watts, intermittent power to 50 watts. **I.M. Analyzer:** 1%, 3%, 10%, 30%, 100% full scale. **Input impedance—AC VTVM:** 1 megohm or 4, 8, 16 or 600 ohm switch selected. **I.M. Analyzer:** 1 megohm or 4, 8, 16 or 600 ohm switch selected. **Wattmeter:** 4, 8, 16 or 600 ohm internal load, 10,000 ohm across external load. **Output impedance—low and high frequency output:** 3000 ohm [600 ohm when shunted with 750 ohm resistor]. **Internal generator frequencies—low frequency, 60 Hz; High frequency, approximately 6 kHz. Accuracy—AC VTVM and wattmeter:** Within 5% of full scale. **I.M. Analyzer:** Within 10% of full scale. **Power requirements:** 105-125 volts 50/60 Hz 20 watts. **Dimensions:** 13" W x 8 1/2" H x 7" D.

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. EST. Call Area 616, 983-3961 for personal service.

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



3. VISIT OUR FACTORY SALES/SHOWROOM

Heath is located on Hilltop Rd., in St. Joseph, Michigan. And our Sales/Showroom is open Mon. thru Fri. from 8:30 a.m. to 5 p.m., and on Saturdays from 9 a.m. to 3 p.m. You can take your kit with you, or arrange for shipment to your home.

Important "Hints" on Shipping

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

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

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

Methods of Payment

Check the appropriate square for whichever method you choose.

1. IN CASH

Do Not Send Currency Or Postage Stamps... send personal check or money order.

2. C.O.D.

A 20% deposit is required on any C.O.D. order. The balance will be collected by the carrier. Payment must be made in cash, money order, or certified check (they will not accept personal checks). C.O.D. Shipments cannot be made if balance is over \$200.

3. CONVENIENT HEATH TIME-PAY PLAN

No money down and up to 12 months to pay on orders from \$25 to \$300. 10% down and up to 18 months to pay on orders from \$300.01 to \$500. Larger down payments reduce monthly payments and carrying charges.

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

Attention Residents Of Puerto Rico And Other U.S. Possessions! A special time pay plan is now available... write our Credit Dept. for details.

SPECIAL ACCOUNTS FOR GOVERNMENT, BUSINESS AND EDUCATIONAL INSTITUTIONS

We offer 30 day terms to governmental, business and educational institutions. An acceptable Dun and Bradstreet rating or names and addresses of five firms with whom you are presently doing business are required.

HEATHKIT OVERSEAS

Many Heathkits are available in special export versions for 115/230 v. AC, 50-60 Hz operation. Look for the "Export model available" note at the bottom of the price lines. For details on international orders and shipments, see the list of overseas units on the back cover or write to International Division, Heath Company, Benton Harbor, Michigan 49022.

IF YOU MOVE...

please send us your **old** address, and your **new** address including Zip Code. This will keep catalogs, correspondence, and your shipments coming without interruption. Use coupon below.

Have You Moved Since Your Last Heathkit Order?

Fill in and mail this coupon to Heath so we can bring your records up to date.

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

My New Address Is:

Name _____
Address _____
City _____ State _____ Zip _____

My Old Address Was:

Name _____
Address _____
City _____ State _____ Zip _____

Be sure to include your zip code no.

EASY PAYMENT CHART

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

**For
Advance
News
On
Future Kits
See
4-Color
Insert
Center of
Catalog**

Preview of:

- **Guitar Kits**
- **Guitar Amplifier Kit**
- **Amateur Station Console**
- **Compact Hi-Fi Speaker**
- **FM Stereo Table Radio**

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Preview Of Kits To Come

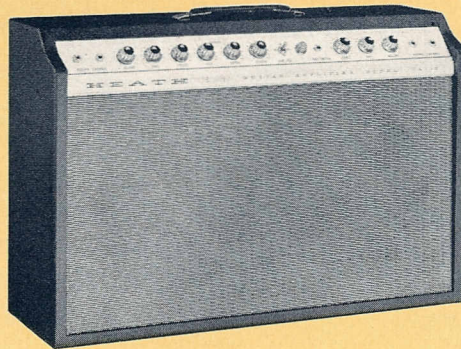
This Is The Kit You've Asked For ... The New Heathkit Transistor Guitar Amplifier ...
With All The Features Guitarists Want At A Price Less Than Half The Usual Cost

EXCITING NEWS! The big sound, the big value in electronic guitars and amplifiers is in these soon-to-be available quality musical instruments. All in kit form, all at a fraction of their usual cost, they will be ready for delivery early in November ... watch for complete details in the Heathkit Christmas Flyer to be mailed in October.

The guitar kits are manufactured for Heath by Harmony, America's largest guitar manufacturer ... more people buy Harmony guitars than any other brand. All models are factory finished and wood parts are assembled.

The amplifier kit is straight from Heath labs ... all transistor ... by the world's most experienced engineers in audio transistor circuitry ... with all the features that guitarists have come to want most in amplifiers.

If you are planning to buy a guitar or amplifier, it will pay to wait for these superb new kits.



- 60 Watts Peak Power — Maximum power from Fail-Safe Complementary Transistor Output Circuit • Two channels — one normal for accompaniment, bass guitar, accordion, combo organ, singer's microphone, etc. — the other, for special effects, lead and solo guitars, has reverb and tremolo
- 2 inputs each channel • Reverb uses the accepted standard double spring unit — reverb amount is variable
- Especially designed LDR Tremolo Circuit is variable both in speed and depth • Line bypass reversing switch for hum reduction • 2 special design 12" heavy-duty speakers • Two foot switches for hands-free control of tremolo & reverb
- 1 easy to build circuit board with 13 transistors and 6 diodes • Heavy duty power transformer — 120 v. or 240 v. AC 50/60 Hertz • Leather-textured black vinyl covered 28" W x 9" D x 19" H cabinet of 3/4" stock for rattle-free performance and long life • Black & white patterned grille cloth • Extruded aluminum front panel with etched nomenclature and chrome-plated knobs

Kit TA-16, 44 lbs., no money down, \$12 mo. \$129.95
Expected Shipping Date: Early November

For complete details on this New Heathkit Line of Quality Guitars and Amplifier, see the Official Announcement in the Heathkit Christmas Flyer — They're Worth Waiting For!



Deluxe Harmony-by-Heathkit Guitar ... With 3 Pickups ... Electro-Acoustic Design ... Truly Professional ... \$329.50 Value For Only \$219.95

- American Made — Quality Made for Lasting Value
- Double Cutaway style-highest registers easily fingered • Ultra-slim fingerboard — short scale (24 1/2") for easy chording, "comping", or solo — of ovalled rosewood with 8 large inlaid position markers • Ultra-slim "uniform feel" neck with adjustable Torque-Lok reinforcing rod • 3 pickups with individually adjustable pole-pieces under each string for the most critical adjustment of emphasis and balance • Flat wound strings for close playing • 3 silent switches select 7 combinations of pickups
- 6 controls for tone and volume of pickups • Metal button tuning keys • "Engraved" headpiece • Plastic pick-guard matches headpiece • Professional Bigsby true vibrato tailpiece • Curly maple Ultra-Thin arched body with "F" holes — 15 3/4" x 40 1/2", 2" rim • Factory buffed and polished — gleaming warm cherry red tone deeply shaded • White and Blue-Black chipboard carrying case with extra thick red plush lining • Includes Instruction book, Tuning record, Pick, Connecting cord, and Deluxe red leather neck strap with cushioned shoulder pad • All wood parts assembled — you mount trim parts, pickups & controls in pre-drilled holes & install the strings

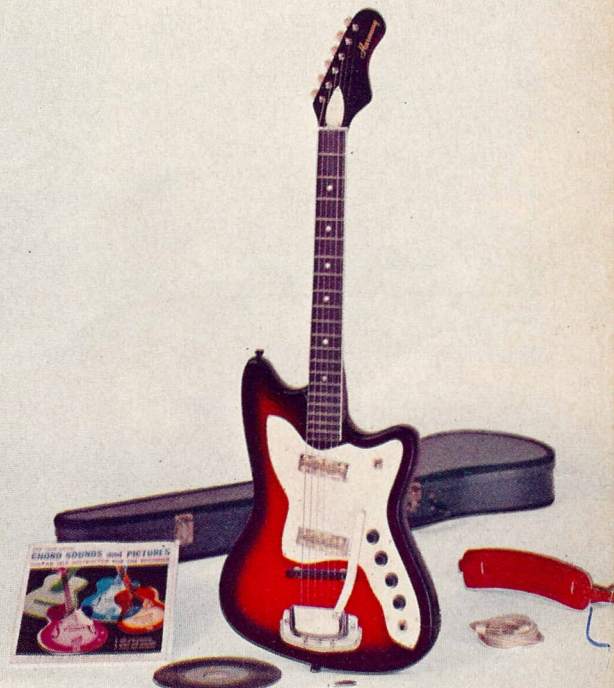
Kit TG-46, 17 lbs., no money dn., \$21 mo. \$219.95
Expected Shipping Date: Early November



Harmony-by-Heathkit "Rocket" Guitar ... Two Pickups ... Plus Electro-Acoustic Design ... Professional Quality ... \$158.50 Value For Only \$119.95 In Kit Form

- American Made Quality For Lasting Value • Single Cutaway style • Ultra-slim fingerboard of ovalled black rosewood • Ultra-slim neck — steel rod reinforced • 2 pickups with individually adjustable pole-pieces under each string for emphasis and balance • Silent switch selects 3 combinations of pickups • 4 Controls for tone and volume • Harmony type "W" tailpiece — unusually responsive • Laminated maple Ultra-thin arched body with "F" holes — 15 3/4" x 40 1/2", 2" rim, celluloid bound edges • White plastic pick-guard
- Factory buffed and polished — rich cherry red lightly shaded • Blue-Black chipboard carrying case with blue plush lining • Includes Instruction book, Tuning record, Pick, Connecting cord, and Deluxe red leather neck strap with cushioned shoulder pad • All wood parts assembled and factory finished — you mount metal parts, pickups, & controls in pre-drilled holes & install the strings.

Kit TG-36, 16 lbs., no money dn., \$11 mo. \$119.95 Expected Shipping Date: Early November



Silhouette Harmony-by-Heathkit Solid-Body Guitar ... 2 Pickups ... Modern Design For Today's Playing ... \$145 Value For \$99.95

- American Made — Quality Made For Lasting Value
- Silhouette — free form profile designed for comfort and easy playing with its modified double cutaway design — 15 frets clear of body • Ultra-slim fingerboard of black rosewood — short scale (24 1/2") for easy chording • Ultra-slim neck for "uniform feel" • Torque-Lok adjustable reinforcing rod • 2 pickups with individually adjustable pole-pieces under each string for emphasis and balance • 3-position toggle switch selects either or both pickups
- 4 Controls for tone and volume • Harmony type "W" vibrato tailpiece — unusually responsive • 6-in-line tuning keys • Hardwood solid body — 12 3/4" x 36 3/4" x 1 1/2" fully rounded edges — fits comfortably under the arm • Factory finished, buffed, and polished — gleaming cherry red deeply shaded • Extra large white plastic pick guard mounted directly on the body — extends under strings and around controls to protect finish • Blue-black chipboard carrying case with blue plush lining • Includes Instruction book, Tuning record, Pick, Connecting cord, and Deluxe red leather neck strap with cushioned shoulder pad • All wood parts assembled and finished — you mount metal parts, pickups, controls in pre-drilled holes & put on strings.

Kit TG-26, 13 lbs., no money dn., \$10 mo. \$99.95
Expected Shipping Date: Early November

Deluxe SB-Series Amateur Station Console ... Four Separate Units In One!

- Includes 24-hour clock, SWR meter, hybrid phone patch and an all-electronic 10-minute timer with audio/visual signaling in one compact unit • Matched in styling and performance with the Heath Deluxe SB-Series amateur radio equipment • Measures 6" H x 10" W x 11 1/2" D — same size as Heath SB-600 speaker and SB-610 signal monitor

Kit **SB-630**, 9 lbs., no money dn., \$8 mo. **\$74.95** Expected Shipping Date: Late November



Compact 2-Way, 2 Speaker System With Acoustic Suspension Design

- 8" acoustic suspension woofer with 6.8 oz. Alnico IV magnet for extended bass • 3 1/2" tweeter with 4.8 oz. Endox IV magnet • Wide 45 to 20,000 Hz frequency response • Handles 10 to 25 watts of program material • 8 ohm impedance • High frequency level control • 1500 Hz crossover frequency • Handsome walnut veneer cabinet with scratch-proof clear vinyl covering for easy cleaning • Easy to build in an hour or two... speakers already cabinet-mounted, you just wire the crossover network

Kit **AS-16**, 17 lbs., no money dn., \$5 mo. **\$49.95**

Expected Shipping Date: Late October

Deluxe Solid-State FM/FM Stereo Table Radio

- All transistor circuit for clean, natural "transistor sound" and cool, instant operation • Automatic switching to stereo • Automatic stereo indicator light • Fixed Automatic Frequency Control for drift-free reception at all times • Adjustable phase control for best stereo • Easy to read slide-rule dial • Tuner and IF section same as used in Heathkit transistor stereo components • Two 5 1/4" PM speakers for crisp, bold stereo • Clutched volume control for individual adjustment of each channel • Tone control • Bookshelf size... measures a compact 19" W x 6 1/2" D x 9 1/4" H • Preassembled, realigned "front-end" to insure peak performance • Assembles easily in about 10 hours with simple circuit board construction • Handsome walnut cabinet blends with any surroundings

Kit **GR-36**, 24 lbs., no money dn., \$7 mo. **\$69.95**

Expected Shipping Date: Late October

Last Call for HEATHKIT® 21" Color TV

Now Save Up To \$48.50 On A Deluxe 21" Color TV And Cabinet Combination . . . A Better-Than-Ever Buy!



GRA-53-7
Deluxe Cabinet
Now Only
\$59.50
(Was \$108.00)

GRA-53A
\$375.00
(less cabinet)

- Built-in Service Center to adjust & maintain set • 26-tube, 8-diode circuit
- Deluxe Standard-Kollsman VHF tuner with "memory" fine tuning • Transistor UHF tuner • High definition 70° 21" "rare-earth" color tube for brighter reds • Anti-glare bonded safety glass • 24,000 volt regulated picture power
- Automatic color control for top color quality • Gated automatic gain control for steady "flutter-free" pictures • Tuners, I.F. and high voltage assemblies factory-built & aligned... just simple circuit boards to wire • Line Thermistor for longer tube life • Tubes alone list for over \$260 • Transformer operated
- Circuit breaker protection • Two hi-fi outputs plus tone control • One-piece metal chassis support for easy set-up & servicing • Mounts in wall, custom cabinet or either Heath cabinet • 1 year warranty on picture tube, 90 days on all other parts

See The Cleanest, Clearest Pictures In Color TV... with the unique life-like sharpness and beauty of the Heathkit GR-53A. The *only* 21" color TV with a "built-in service center" for perfect picture adjustments. Simple-to-follow instructions and detailed color photos show you exactly what to look for and how to achieve it... quickly, easily! You become the expert. Results? True-to-life color pictures day in and day out... and the elimination of many servicing headaches.

From Parts To Picture In Just 25 Hours. And as easy to build as an audio amplifier... you simply wire 3 circuit boards, mount the parts, connect a color-coded wiring harness, and adjust the picture... all critical circuits are pre-assembled and aligned at the factory to insure peak performance.

But Don't Take Our Word For It. Ask any GR-53A owner like Mr. James Rusler of Huntington, Ind. He writes: *"We have many friends to our house and always receive universal comment that our color is far better than anything they have seen. The satisfaction of assembling the set increases the enjoyment that much more, and I haven't had one bit of trouble in eight months. Your complete and comprehensive manual dealing with service assures me that if there is a need for adjustment that it can be done without the services of a service repairman."*

Choice of 3-Way Installation. Another exclusive Heathkit feature! Mount in a wall, your own cabinet, or either of the Heath factory-assembled cabinets.

Kit GR-53A, all parts including chassis, tubes, mask, UHF & VHF tuners, mounting kit and specially shielded, extended range 6" x 9" speaker. 125 lbs.. \$38 dn., as low as \$22 mo. (REA Express or Motor Freight only) **\$375.00**

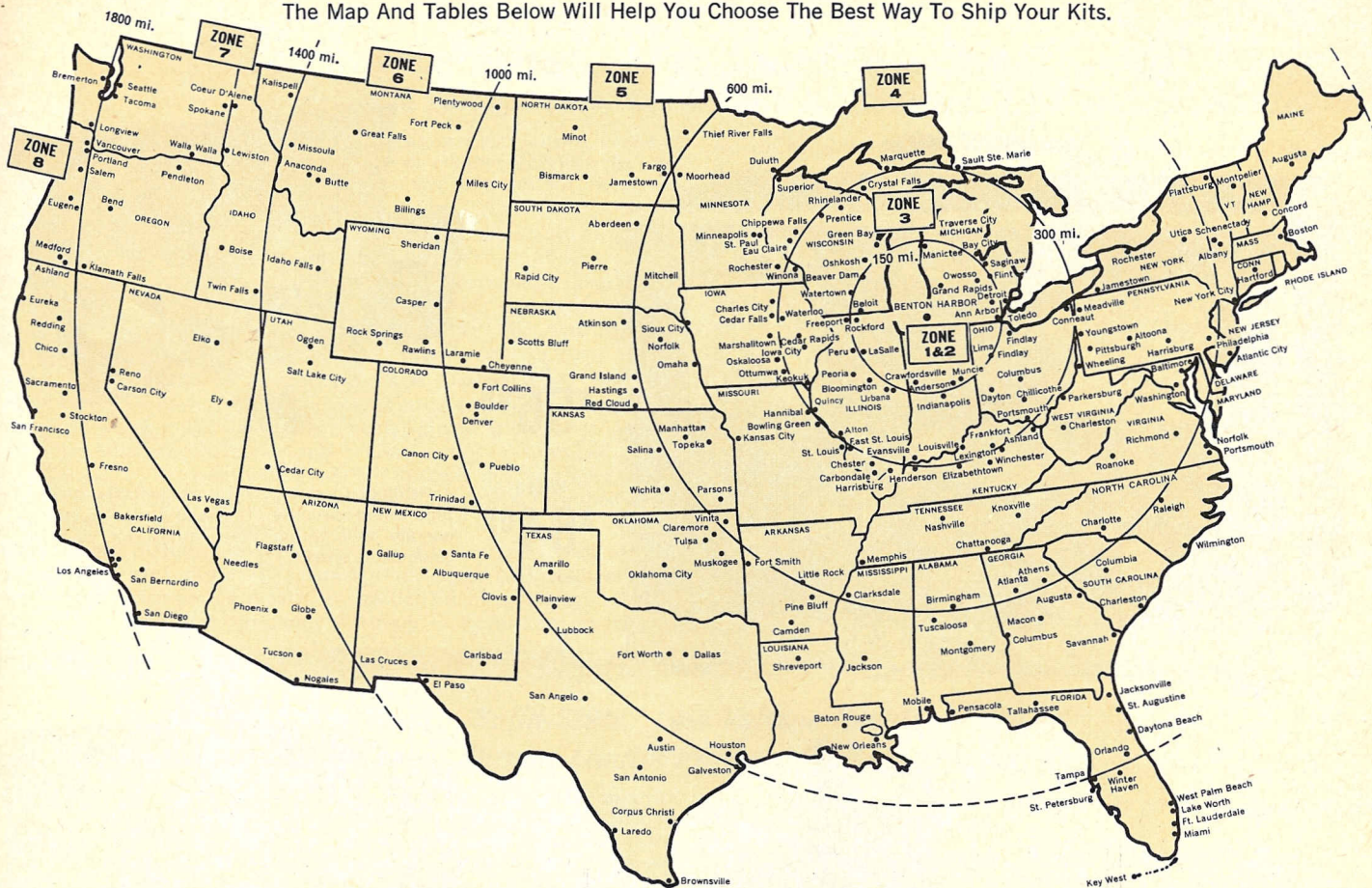
Assembled GRA-53-7, deluxe walnut cabinet (measures 44" W x 32 3/8" H x 26 1/2" D) 82 lbs... no money dn., \$6 mo. (REA Express or Motor Freight only) **Was \$108.00, Now Only \$59.50**

Assembled GRA-53-6, economy walnut-finished hardboard cabinet (measures 37 3/4" w x 33 1/4" H x 26 1/4" D) 51 lbs... no money dn., \$5 mo. (REA Express or Motor Freight only) **Was \$46.50, Now Only \$39.50**

GR-53A SPECIFICATIONS—Picture size: 21" round, approx. 265 sq. in. Deflection: Magnetic 70°. Focus: Electro-static. Convergence: Magnetic. Antenna input impedance: 300 ohm balanced. Picture IF carrier frequency: 45.75 MHz. Sound IF carrier frequency: 41.25 MHz. Color sub-carrier: 42.17 MHz. Sound IF frequency: 4.5 MHz. Tuning range: VHF TV Channels 2-13; UHF 14-83. Sound cathode follower: Output impedance: 3K. 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, 50-15,000 Hz. Harmonic distortion: Less than 3%. Power requirements: 110 V to 130 V, 60 Hertz AC, 300 watts. Wall mounting space required: 25" D x 25" H x 28" W.

How To Figure Shipping Costs

The Map And Tables Below Will Help You Choose The Best Way To Ship Your Kits.



Find Your Parcel Post Zone On Map . . . Then Refer To Rate Table Below.

Parcel Post Rates

Items in this catalog are mailable unless indicated with "REA Express Or Motor Freight Only" in the price line.

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.

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.

MOTOR FREIGHT RATES

Approximate Motor Freight rates are shown below. For more exact information on rates and deliveries check with a local trucking company.

Do not enclose money for Motor Freight with your order. Shipping charges are collected by the carrier at the time of delivery.

PARCEL POST RATE TABLE

Weight 1 lb. and not to exceed	Up to 150 miles 1-2	150 to 300 3	300 to 600 4	600 to 1,000 5	1,000 to 1,400 6	1,400 to 1,800 7	Over 1,800 miles 8
2	\$0.40	\$0.42	\$0.46	\$0.52	\$0.59	\$0.66	\$0.72
3	.46	.49	.55	.64	.73	.83	.93
4	.51	.55	.64	.75	.88	1.01	1.13
5	.57	.62	.72	.87	1.02	1.18	1.34
6	.62	.68	.80	.97	1.15	1.34	1.53
7	.68	.75	.88	1.07	1.28	1.50	1.73
8	.73	.81	.95	1.18	1.41	1.66	1.92
9	.78	.87	1.03	1.28	1.53	1.82	2.12
10	.83	.93	1.10	1.38	1.66	1.98	2.31
11	.88	1.00	1.18	1.48	1.78	2.14	2.48
12	.93	1.06	1.26	1.58	1.90	2.29	2.66
13	.98	1.12	1.33	1.69	2.02	2.44	2.83
14	1.03	1.18	1.41	1.79	2.14	2.60	3.01
15	1.08	1.24	1.48	1.89	2.25	2.75	3.18
16	1.13	1.30	1.56	1.99	2.37	2.90	3.36
17	1.18	1.36	1.64	2.09	2.49	3.06	3.53
18	1.23	1.42	1.71	2.20	2.61	3.21	3.71
19	1.28	1.48	1.79	2.30	2.73	3.36	3.88
20	1.32	1.54	1.86	2.40	2.85	3.51	4.06
21	1.36	1.59	1.93	2.48	2.96	3.65	4.23
22	1.40	1.64	1.99	2.57	3.07	3.79	4.40
23	1.44	1.69	2.06	2.65	3.18	3.93	4.57
24	1.48	1.73	2.12	2.74	3.29	4.07	4.74

Weight 1 lb. and not to exceed	Up to 150 miles 1-2	150 to 300 3	300 to 600 4	600 to 1,000 5	1,000 to 1,400 6	1,400 to 1,800 7	Over 1,800 miles 8
25	\$1.52	\$1.78	\$2.18	\$2.82	\$3.40	\$4.21	\$4.91
26	1.56	1.83	2.25	2.91	3.51	4.35	5.08
27	1.60	1.87	2.31	2.99	3.62	4.49	5.25
28	1.64	1.92	2.38	3.08	3.73	4.63	5.42
29	1.68	1.97	2.44	3.16	3.84	4.77	5.59
30	1.71	2.01	2.50	3.25	3.95	4.91	5.76
31	1.75	2.06	2.57	3.33	4.06	5.05	5.93
32	1.79	2.11	2.63	3.42	4.17	5.19	6.10
33	1.83	2.16	2.70	3.50	4.28	5.33	6.27
34	1.87	2.20	2.76	3.59	4.39	5.47	6.44
35	1.91	2.25	2.82	3.67	4.50	5.61	6.61
36	1.95	2.30	2.89	3.76	4.61	5.75	6.78
37	1.99	2.34	2.95	3.84	4.72	5.89	6.95
38	2.03	2.39	3.02	3.93	4.83	6.03	7.12
39	2.07	2.44	3.08	4.01	4.94	6.17	7.29
40	2.10	2.48	3.14	4.10	5.05	6.31	7.46
45	2.30	2.72	3.46	4.52	5.60	7.01	8.26
50	2.49	2.95	3.78	4.95	6.15	7.71	9.06
55	2.65	3.19	4.08	5.35	6.70	8.36	9.86
60	2.81	3.42	4.38	5.75	7.25	9.01	10.66
65	2.97	3.66	4.68	6.15	7.80	9.66	11.46
70	3.13	3.89	4.98	6.55	8.35	10.31	12.26

IMPORTANT: Parcel Post rate changes enacted April, 1964 are reflected in this table.

MOTOR FREIGHT RATE CHART

Charges for 100 lbs. or Less	Up to 150 miles	150 to 300	300 to 600	600 to 1,000	1,000 to 1,400	1,400 to 1,800	Over 1,800 miles
Type of Merchandise Instruments	\$4.91	\$5.18	\$6.53	\$7.00	\$7.77	\$ 8.80	\$10.63
T.V.'s Organs Receivers Transmitters Amplifiers Record Players	\$4.91	\$5.18	\$6.53	\$7.00	\$8.18	\$11.00	\$13.31
Cabinets	\$4.91	\$5.18	\$6.86	\$7.97	\$9.77	\$13.21	\$15.97

R.E.A. EXPRESS RATES

Approximate Express rates are shown below. For more exact information on rates and deliveries check with your local REA office.

Do not enclose money for Express with your order. Shipping charges are collected by REA at time of delivery.

EXPRESS RATE CHART

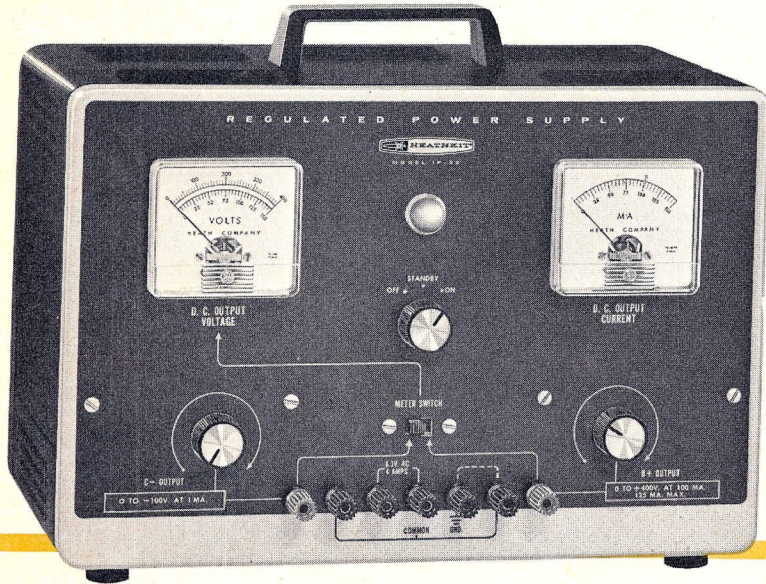
Shipping Weight	Up to 150 miles	150 to 300	300 to 600	600 to 1,000	1,000 to 1,400	1,400 to 1,800	Over 1,800 miles
5 lbs.	\$3.98	\$3.98	\$3.98	\$4.01	\$4.04	\$4.16	\$4.23
10 lbs.	\$4.20	\$4.26	\$4.38	\$4.52	\$4.72	\$5.03	\$5.18
20 to 75 lbs.	\$4.75	\$4.71	\$5.35	—	—	—	—
30 to 75 lbs.	—	—	—	\$6.24	\$7.64	\$8.56	\$8.93
100 lbs.	\$4.75	\$4.71	\$5.35	\$6.27	\$7.69	\$8.61	\$8.98

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



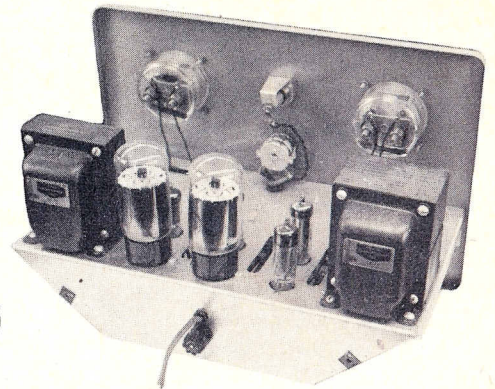
TEST
INSTRUMENTS

Power Supplies . . . For Engineering

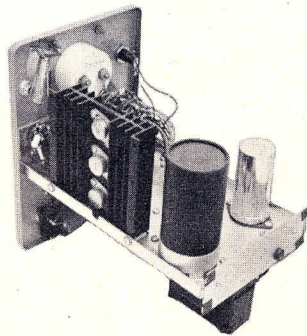


Kit
\$56⁹⁵

Wired
\$84⁹⁵



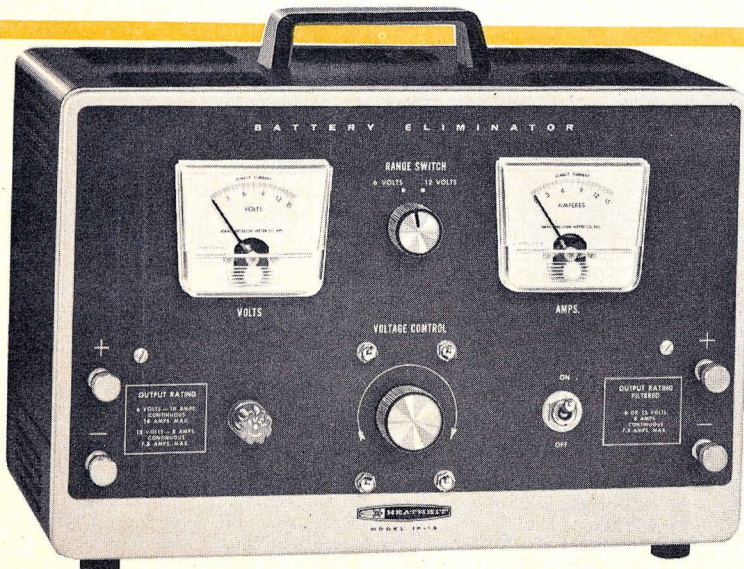
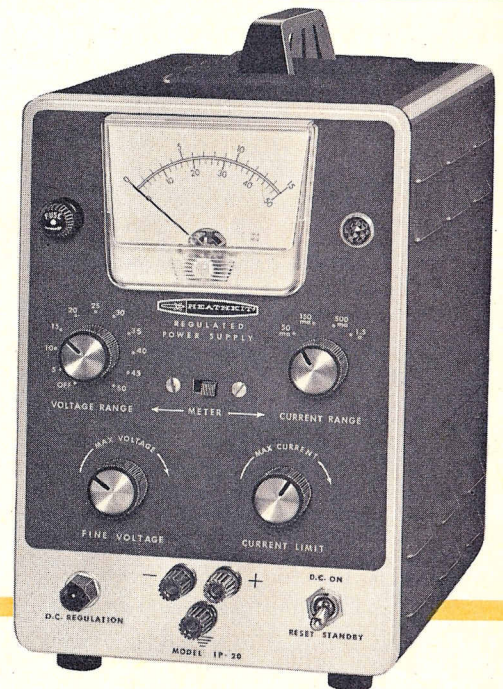
A Heathkit Classic . . . features reliable, proven, time-tested circuitry. The dual series-regulators operate well within their ratings for years of dependable service.



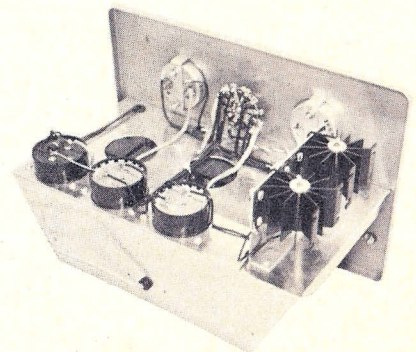
Large area heat sink assures long component life and stable operation. Spacious component layout provides ample ventilation . . . easy assembly.

Kit
\$72⁹⁵

Wired
\$114⁹⁵



Kit
\$47⁵⁰



Husky silicon diode rectifiers maintain a minimum of internal voltage drop—a maximum of efficiency and dependability.

Research, Servicing, And For The Scientific Lab

Heathkit Variable Voltage Regulated Power Supply Provides High Voltage, Bias, And 6.3 VAC For Countless Applications

- Furnishes B+, Bias, & Filament voltages • DC output variable from 0 to 400 volts • Separate panel meters monitor output voltage & current • Output terminals are isolated for safety in AC/DC work

Serves Hundreds Of Uses In The Shop And Laboratory. Originally intended for the experimenter and repair man, the IP-32 now can be found in physics, chemistry, and university electronics laboratories throughout the world. It's the perfect DC voltage source for electrophoresis in chemistry, and has been chosen by The University of California for the new Berkeley Physics Laboratory course.

Saves Time And Labor In Servicing And Design Work. With the Heathkit IP-32 power supply there's no need to build up a separate power supply for each new experimental circuit tried in design and development work. In service applications, faulty or suspected power supplies can be bypassed with the IP-32 to see if the remainder of the circuit is working properly. B+ and bias voltages are furnished for a wide range of applications.

Convenient "Standby" Switch. Separate filament and high voltage transformers used in the IP-32 permit switching all high voltages "off" while circuit changes or repairs are made. Filament voltage remains "on," eliminating time-consuming warm-up time. Built-in circuit pro-

tection prevents damage to the power supply should the bias voltage be accidentally shorted.

Separate Panel Meters. Output voltage and current are continuously monitored by separate panel meters for exact settings to circuit requirements. Regulated B+ output is variable from 0 to 400 volts DC at up to 100 ma (125 ma maximum). Bias voltage is variable from 0 to -100 volts DC at 1 ma, and filament voltage of 6.3 volts AC is available at up to 4 amperes. Output terminals are separate and well insulated for safety in AC/DC work.

Quality-Designed Throughout. Rugged, well-rated components are used throughout the design of the IP-32 for years of dependable, trouble-free performance. Add this valuable unit to your testing facilities now.

Kit IP-32, 17 lbs.... No money down, \$6 mo. **\$56.95**
Assembled IPW-32, 18 lbs.... No money down, \$9 mo. **\$84.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IP-32 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., 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. Dimensions: 13" W x 8 1/2" H x 7" D.

Heathkit "Solid-State" Low Voltage Regulated Power Supply . . . Current Limiter Protects Equipment Under Test

- All-transistor solid-state circuitry • Relay protected against short circuit & overload • 0.5 to 50 VDC with better than ± 15 millivolts regulation • Four current ranges, 50 MA, 150 MA, 500 MA & 1.5 A. • Adjustable current limiter, 30 to 100% on each range • Series type voltage regulator, zener diode reference

A Tremendous Value In A DC Supply! The Heathkit IP-20 is another example of the advanced-design instruments available at substantial do-it-yourself savings. Offering more in features and circuit refinements than power supplies costing several times this price, the IP-20 features an all-transistor circuit that will deliver up to 1.5 amperes from 0.5 to 50 volts DC for a multitude of applications in servicing and design work or industrial uses.

Ultra-Smooth DC Output. Highly-filtered output has less than 150 microvolts AC ripple . . . ideal for servicing the new transistorized audio amplifiers, tuners, radios and TV sets now on the market. A necessity for any well-equipped service-shop or lab.

Adjustable Current Limiter. Current output is automatically limited on any range to a pre-set value to protect both the power supply and the

circuit under test. An overload relay is also provided to protect against a direct short or heavy overload.

Metered Output Voltage And Current. Voltage and current settings are simplified with the built-in panel meter. A slide-switch selects either output. Four current ranges provide 50, 150, 500 ma and 1.5 amperes full-scale, and the three voltage ranges provide 5, 15 and 50 volts DC. Finned "heat-sinks" protect the heavy-duty power transistors for long, faithful service. Your best buy in a DC supply.

Kit IP-20, 13 lbs.... No money down, \$8 mo. **\$72.95**
Assembled IPW-20, 16 lbs.... No money down, \$11 mo. **\$114.95**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IP-20 SPECIFICATIONS—Input: 105-125 volts 50/60 Hz; 125 watts at full load (50V, 1.5A). Output: 0.5-50 volts DC; 1.5 amps max. DC. Load regulation: ± 15 millivolts, can be adjusted for no change. Line regulation: (105 to 125 VAC): Less than .005% change. Ripple & noise: Less than 150 microvolts. Transient response: Less than 25 microseconds. Output impedance: Less than .1 ohm DC to 10 kHz; less than .5 ohms 10 kHz & up. Overload protection: Current limiter & relay. Meter: 3 1/2", 1 mA, 50 ohm. Current ranges: 50 mA, 150 mA, 500 mA, 1.5 A. Voltage ranges: 5V, 15V, 50V. Front panel controls: On/Off, Coarse voltage switch, Fine voltage adjust, Current range switch, Current limit adjust, Meter slide switch, DC regulation, Reset Standby toggle switch. Output terminals: (3), plus (+), minus (-), chassis ground. Dimensions: 9 1/2" H x 6 1/2" 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

A Modern Source Of 6 Or 12 Volt Power. The IP-12 provides a ready, reliable source of well-filtered 6 or 12 volt DC power for servicing transistor or hybrid electronic equipment. The variable voltage control permits a wide range of uses as a general purpose low-voltage supply, as well. The IP-12 eliminates the need for storage batteries in your shop.

Metered Output. Output voltage and current are continuously monitored by separate panel meters to meet exact test requirements. Output voltage is variable in two ranges from 0-8 volts or 0-16 volts.

Special Ripple-Filter Circuit. Separate terminals are provided for normal output where high current is required, such as in charging batteries, plus a highly-filtered output that holds AC ripple to less than .3% for exceptionally smooth DC. This feature is a necessary requirement for

use in servicing transistor and hybrid radios which can tolerate only a small amount of "hum-producing" AC ripple.

Many Applications In Servicing. The Heathkit IP-12 is ideal for use in servicing transistor and hybrid automobile radios, portables, citizen's band two-way radio equipment, portable tape recorders, portable record players, mobile P.A. systems and many more.

Doubles As A Convenient Battery Charger. The IP-12 can be used as a trickle-charger for auto and boat batteries to keep them in peak operating condition and also serves as a handy charger for rechargeable wet-cells such as used in radio-controlled hobby equipment. Easy to build with complete instructions supplied.

Kit IP-12, 18 lbs.... No money down, \$5 mo. **\$47.50**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

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



TEST
INSTRUMENTS

Heathkit® Service & Test Equipment..

6-Decade Resistance Kit

This extremely accurate Heathkit resistance decade is specially designed for laboratory use. It will provide resistance values in 1 ohm steps from 1 ohm to 999,999 ohms. Ideal for use as an arm for AC and DC bridges. Range switches have make-before-break contacts for smooth switching action without opening or shorting the circuit.

Kit IN-11, 3 lbs. No money down, \$5 mo. \$24.95

IN-11 SPECIFICATIONS: Range: 1 ohm to 999,999 ohms in 1 ohm steps. **Resistors:** Precision, 1/2% accuracy, 1 watt. **Minimum DC resistance:** 0.43 ohms or less at terminals with all sw. set at zero. **Dimensions:** 7 1/2" W x 5" H x 6 5/8" D.

3-Decade Capacitance Kit

This capacitance decade provides convenient, switch-selected, 1% silvered mica capacitor values from 100 pF to 0.111 μF in 100 pF steps. Ideal for use in substitution tests, or in comparison bridge circuits where high accuracy is desired. This precision, laboratory instrument features high quality ceramic wafer switches with positive detent action.

Kit IN-21, 3 lbs. \$17.95

IN-21 SPECIFICATIONS—Range: 100 pF to 0.111 μF in increments of 100 pF. **Voltage rating:** 350 V. DC continuous; 500 V. DC intermittent; 1000 V. DC instantaneous test. **Accuracy of incremental capacity:** ±1%. **Stray capacitance:** 10 to 15 pF at terminals. **Dimensions:** 7 1/8" W x 4" H x 5" D.

Heathkit Resistance Substitution Box

A valuable addition to the service shop! Enables convenient substitution tests for replacement of unknown or unrecognizable resistors . . . ideal too for experimentally altering circuit characteristics. IN-12 provides switch-selection of any one of 36 E.I.A. standard 10% 1-watt resistors, ranging in value from 15 ohms to 10 megohms. A slide-switch selects high or low resistance ranges. Case measures 5 3/8" L x 3 1/8" W x 3" H.

Kit IN-12, 2 lbs. \$5.95

Heathkit Capacitor Substitution Box

Here is a handy kit for use in applications where an open or shorted capacitor is suspected. An 18-position panel switch selects any one of 18 popular E.I.A. standard capacitor values ranging from 0.0001 μF to 0.22 μF. All capacitors are rated at 600 volts except the smallest three and the two largest which are 500 and 400 volts, respectively. High-quality silver-mica and molded tubular capacitors are used throughout. 18" test leads with alligator clips are included. Case measures 5 3/8" L x 3 1/8" W x 3" H.

Kit IN-22, 2 lbs. \$5.50

Heathkit Impedance Bridge

- Measures resistance, capacitance, low Q and high Q inductance with four separate bridge circuits
- Slanted control panel for easy reading & operation
- Built-in generator & detector amplifier
- Battery-type vacuum tube circuitry for fast warmup
- 1/2% precision resistors and silver-mica capacitors

Dependable Laboratory Accuracy Is Assured Through Use Of Precision Components. The four bridge circuits assembled in this instrument are: a Wheatstone bridge for measuring resistance, a Capacitance Comparison Bridge for capacitance, a Maxwell Bridge for low Q inductance, and a Hay Bridge for high Q inductance.

Battery-Type Vacuum Tube Circuits . . . ready to go at a flick of the switch, permits measurement over a wide range of component values, and minimizes changes in operating characteristics due to thermal effects.

Kit IB-2A, 11 lbs. No money down, \$7 mo. \$69.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IB-2A SPECIFICATIONS—Circuit: 4-arm impedance bridge. **DC Measurements:** Built-in power supply. Binding posts provided for external supply. **Meter:** 100-0-100 microampere meter. **AC Measurements:** Built-in 1000 Hz generator. Terminals on panel for external generator at other audio frequencies. **Detector:** Vacuum tube detector and amplifier, using built-in meter. Terminals provided for external detector. **Resistance:** 0.1 ohm to 10 megohm. **Capacitance:** 100 pF to 100 μF. **Inductance:** 0.1 mH to 100 H. **Dissipation factor:** (D) 0.002 to 1. **Storage factor:** (Q) 0.1 to 1000. **Accuracy:** 1/2% decade resistors used. **Tube complement:** (2) 1U4, (2) 1L4. **Power supply:** Transformer and silicon rectifier. **Power requirements:** 105-125 V. 50/60 Hz AC, 10 watts. **Dimensions:** 8" H x 17" W x 6" D.



IN-11
\$24⁹⁵



IN-21
\$17⁹⁵



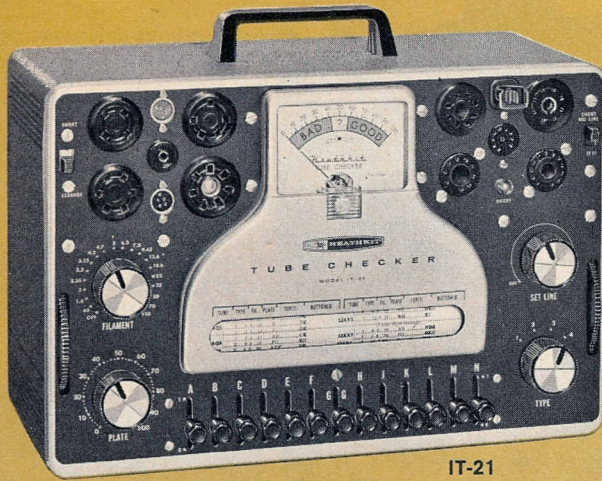
IN-12
\$5⁹⁵

IN-22
\$5⁵⁰



IB-2A
\$69⁹⁵

Value Leaders For Nearly Two Decades



IT-21
\$44⁹⁵



TT-1A
\$149⁹⁵

Heathkit Tube Checker . . . Fills All Daily Service Requirements

- Tests most all tube types including new Compactron, Nuvistor, Novar and 10-pin miniatures • Multi-colored "bad-?-good" meter scale • Constant tension, free-rolling roll chart mechanism • Color-coded wiring harness for fast, easy assembly

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.

Shows Positive Evaluation Of Tube Quality. Tubes are tested for quality on the basis of total emission and for shorts, leakage, open elements and filament continuity. Tube 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. Multiple filament voltages (switch-selected), adjustable cathode current, variable meter sensitivity and individual tube element switching provide complete operating convenience . . . and protect against obsolescence. Thirteen 3-position lever switches allow checking each tube element individually for open or short conditions and simplifies the addition of new tube types as they become available.

Special Roll-Chart Mechanism. Featured in the IT-21 is a smooth, free-rolling mechanism that is spring-loaded to keep the chart taut 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-21 now for dependable test facilities at low-cost!

Kit IT-21, 12 lbs. . . No money down, \$5 mo. \$44.95

IT-21 SPECIFICATIONS—Tests: Emission, short, leakage, open element, filament continuity. Sockets: 4-pin, 5-pin, 6-pin, 7-pin combination and pilot light, 7-pin miniature, octal, local, 10-pin miniature, 9-pin novar, 12-pin compactron, 5-pin nuvistor, 7-pin novistor. Meter: 1 ma, BAD-?-GOOD scale, illuminated. Line voltage adjustment: Step type. Roll chart mechanism: Constant tension, free-rolling, thumbwheel operation, illuminated. Filament voltage: .63, 1.4, 2, 2.35, 2.5, 3.15, 4.2, 4.7, 5, 6.3, 7.5, 9.45, 12.6, 19.6, 25, 32, 50, 70, 110 V AC. Element test voltages: 30, 100, 250 V AC. Power requirements: 105-125 V AC, 50/60 Hz. Dimensions: 13" W x 8 1/2" H x 5 1/2" D.

REPLACEMENT ROLL CHARTS

Updated replacement roll charts for all Heathkit tube checkers can be purchased after the 1st of each year. Prices are \$1.50 for TT-1A Testers; \$1.00 for IT-21 & TC-series Checkers.

Heathkit Mutual-Conductance Tube Tester . . . Tests Dynamic Transconductance For Highest Quality Tube Check

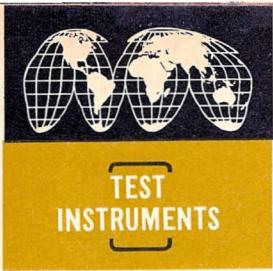
- No finer tube tester in kit form anywhere! • Indicates Gm to 24,000 micromhos • Ultra-sensitive grid current test • Direct reading ohmmeter leakage test • Constant current heater supplies • Built-in switch-operated calibration circuit for high accuracy • Built-in adapter for testing Compactron, Nuvistor, Novar & 10-pin miniature tube types

An Outstanding Array Of Features. Versatile switching facilities accommodate all tube types, regardless of base-pin connections, to protect against obsolescence. The TT-1A will provide quick and accurate tests of mutual conductance (Gm) from 0 to 3,000 micromhos, with multipliers to extend this range to 24,000 micromhos . . . an ultra-sensitive grid-current test . . . direct-reading ohmmeter leakage test . . . life test . . . hybrid tube test . . . and many more! Constant-current heater supplies protect against obsolescence by supplying the correct voltage for any tube types drawing 300 ma, 450 ma or 600 ma. A Disconnect Switch removes all voltage potentials 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 both sections of a twin triode individually with only one group of selector switch settings for extra operating convenience.

Built-In Calibration Circuit. The switch-operated calibration circuit designed into the TT-1A assures continued high accuracy for the life of the tester . . . no standardized tubes, voltmeters or other instruments are required. Chosen by professionals in virtually every phase of the electronics industry, the TT-1A offers sophisticated, thorough testing facilities at a low acquisition cost.

Kit TT-1A, 33 lbs. . . No money down, \$14 mo. \$149.95

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



Heathkit® Oscilloscopes . . . For The

Heathkit "Space-Saver" 3" DC Oscilloscope Identical X and Y Input Channels

- Identical vertical & horizontal DC or AC coupled amplifiers
- DC to 200 kHz bandwidth—less than 5° 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 from job to job
- Same panel size as IM-11 VTVM

A High-Quality, Professional Instrument, Compactly Designed . . . the IO-10 occupies only a fraction of the space required by scopes of comparable function, yet offers exceptional versatility to cover a wide range of applications in medical, industrial and general service fields. Identical vertical and horizontal amplifiers may be either AC or DC coupled with simple switch-selection of either input for measurement of AC or DC voltages.

Provides Extremely Low Sweep Rates. The recurrent sweep generator employed in IO-10 covers 5 Hz to 50 kHz in four overlapping ranges . . . lower sweep rates may be obtained by connecting additional capacitors across the external binding posts provided. This feature is especially useful in medical and industrial applications such as in computer "read-out" work where low sweep rates are desired. Less than 5° phase-shift between channels makes this scope ideal for phase-shift measurements.

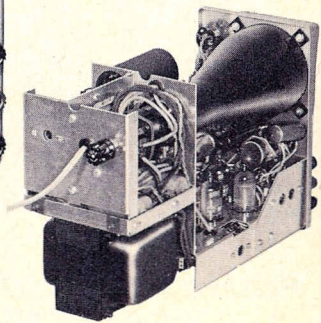
Faithful Waveform Presentations. A 3-position compensated input attenuator in each channel provides smooth control of waveform display. Trace distortion is minimized by a special alloy CR tube shield and an astigmatism control helps obtain a sharp, fine trace. All critical voltages are regulated for high stability. Power supply is transformer operated for safety and high efficiency.

Kit IO-10, 16 lbs. . . No money down, \$10 mo. \$94.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.



IO-10
\$94.95

Efficient use of chassis space puts high-performance circuitry and quality components into a compact instrument.

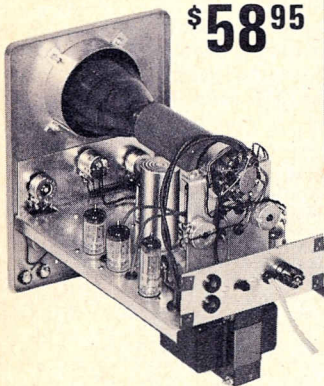


IO-10 SPECIFICATIONS—(Vertical and horizontal channels identical): Bandwidth: DC to 200 kHz (2 db point). Sensitivity: 0.1 V (peak-to-peak) per 1/4" (uncalibrated). Attenuator: 3-position, compensated type. Gain control: Continuously variable. Input impedance: 3.6 megohms shunted by 35 mmf. Coupling: Either AC or DC, switch-selected. Relative phase shift between channels: Less than 5°. Sweep generator (Recurrent type): Linear 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: 7 1/2" H x 4 1/4" W x 11" D.

Clean, open circuit layout and the comprehensive assembly instructions make this the perfect scope for the beginner. See "How To Understand & Use Your Oscilloscope" (page 65). By far the most popular Heathkit "How To . . ." course!



IO-21
\$58.95



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 1kHz. Input impedance: 10 megohms shunted by 20 uuf. (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, Sweep Range switch. (Focus and Astigmatism controls mounted on chassis). Power requirements: 105-125 volts AC, 50-60 Hz, 40 watts. Dimensions: 9 1/2" H x 6 1/2" W x 10" D.

Heathkit "General Purpose" 3" Oscilloscope Fulfills Hundreds Of Service Shop & Classroom Requirements

- Identical push-pull vertical and horizontal amplifiers—2 Hz to 200 kHz response
- Wide-range sweep generator—20 to 100,000 Hz
- Automatic sync retrace blanking
- Professional-quality components throughout
- Clean, open circuit layout for easy assembly

A Dependable, Well-Rated Oscilloscope For General-Purpose Requirements . . . This handy scope is lightweight, surprisingly versatile, and is provided with modern, stable circuitry. It is a highly capable instrument intended for the service shop, the hobbyist's den, the ham shack, and as an extra scope for general laboratory use.

Easy-To-Build. The components are arranged on a shallow chassis, eliminating hard-to-get-at corners, and allowing a clean, open circuit layout for easy, trouble-free assembly . . . perfect for beginners and students.

Extra Quality In Circuit Design. Identical vertical and horizontal amplifiers provide more than adequate frequency response for all general circuit investigations. Focus and astigmatism controls assure a sharp trace, and the special alloy neck shield for the 3RP1 CR tube minimizes the possibility of trace distortion due to external magnetic fields. Direct connection to the vertical deflection plates is available for such applications as high-level RF monitoring in transmitter work. Husky, well-rated power supply is fused for protection. All components are of highest quality. Order this fine scope for the best in instrument values.

Kit IO-21, 12 lbs. . . No money down, \$6 mo. \$58.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.
See page 65 for comb. offer with EF-2 Applications Course. . . . \$66.95

Classroom, Service Bench & Industry



Heathkit 5" Wide-Band Laboratory Oscilloscope Designed To Satisfy The Rigorous Demands Of Troubleshooting B & W And Color TV Circuitry

- 5 MHz bandwidth • Heath patented sweep circuit—10 Hz to 500 kHz • Push-pull vertical & horizontal amplifiers • Circuit board construction • Facilities for two preset adjustments in the horizontal sweep circuit for returning to often-used sweep frequencies • Up to 50% savings over equivalent oscilloscopes

Preferred By Thousands Who Demand A High Performance Instrument! . . . the Heathkit IO-12 has proven itself to be an unmatched value. Because of its wide application range, it has found its way into service shops, professional and university laboratories, industries, and home test benches all over the world.

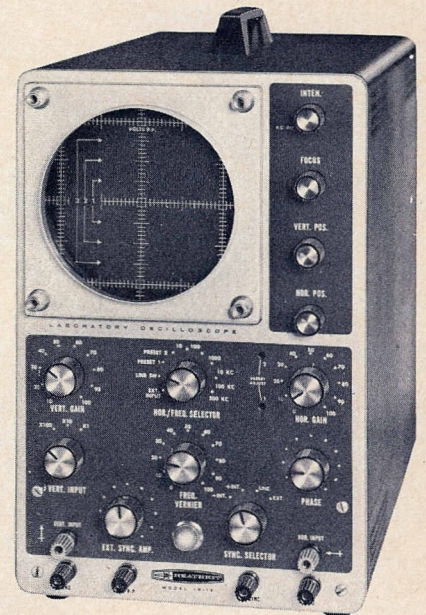
A Dependable Instrument Through Quality Engineering . . . Excellent linearity and lock-in characteristics assure stable waveform presentations even at upper frequency limits. Wide band amplifiers and wide range sweep make the IO-12 ideal for many specialized as well as general investigations. Two "pre-set" sweep frequency choices are an invaluable aid in servicing the vertical and horizontal circuits of television receivers.

Chosen For The Berkeley Physics Laboratory. Model IO-12S features output jacks for connection to the HV and sweep circuits . . . for application in Berkeley Physics Laboratory experiments.

The IO-12 Has Features That Create High Performance . . . including push-pull vertical and horizontal output amplifiers, positive trace position controls, peak-to-peak calibration reference, 3-step frequency compensated vertical input, automatic sync circuit, Z-axis input, 5U1 CR tube, and a husky, well-rated power supply. Chances are, an IO-12 will satisfy your oscilloscope requirements . . . compare the specifications.

- Kit IO-12, 24 lbs. . . No money down, \$8 mo. \$79.95
- Assembled IO-12, 23 lbs. . . No money down, \$13 mo. \$134.95
- Kit IO-12S, Berkeley Laboratory Version, 25 lbs. \$79.95
- Wired IO-12S, Assembled Berkeley Version, 24 lbs. \$134.95
- Export model available for 115/230 VAC, 50-60 Hz; write for prices.
- See Page 65 for comb. offer with EF-2 Applications Course. \$87.95

IO-12 SPECIFICATIONS—(Vertical) Sensitivity: 0.025 volts RMS per inch at 1 kHz. **Frequency response (referred to 1 Hz to 400 kHz. Input impedance:** 4.9 megohms at 1 kHz. **Sweep generator:** Range—10 Hz to 500 kHz in five steps, 0.08 microseconds or less. **Input impedance:** (AT 1 kHz) 2.7 megohms at X1; 3.3 megohms at X10 and X100. **(Horizontal) Sensitivity:** 0.3 volts RMS per inch at 1 kHz. **Frequency response:** ±1 db 1 Hz to 200 kHz; ±3 db 1 Hz to 400 kHz. **Input impedance:** 4.9 megohms at 1 kHz. **Sweep generator:** Range—10 Hz to 500 kHz in five steps, variable, plus any 2 switch-selected preset sweep frequencies in this range. **Synchronizing:** automatic lock-in circuit using self-limiting synchronizing cathode follower. **Power requirements:** 105-125 volts 50/60 Hz AC at 80 watts; fused. **Dimensions:** 14 7/8" H x 8 5/8" W x 16" D.



Kit IO-12 \$79.95
Wired IO-12 \$134.95

Oscilloscope Accessories

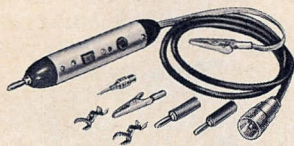
337-C
\$3.50



Scope Demodulator Probe Kit

Provides added versatility in oscilloscope applications by permitting visual observation of the modulation envelope waveform of RF and IF signals. Useful in both radio and TV servicing in checking for distortion and presence or absence of modulation. Functions as an AM detector . . . passes only modulation of signal. Voltage limits are 30 volts RMS, 500 volts DC. Can be used with all Heath Oscilloscopes.

- Kit 337-C, 1 lb. \$3.50
- Assembled 337W-C, 1 lb. \$4.50



PK-1
\$4.95

Low Capacitance Scope Probe Kit

This probe is an essential aid in high frequency circuit investigations . . . minimizes loss of gain, circuit loading or distortion due to overloading of scope input. A switch on the probe body provides direct or X10 attenuated operation and an adjustable trimmer capacitor provides proper match to scope input. An assortment of connectors is included with the kit to match most oscilloscope terminals. Wiring options permit impedance match to IO-12 (3.3 megohms) or IO-14 (1 megohm) input.

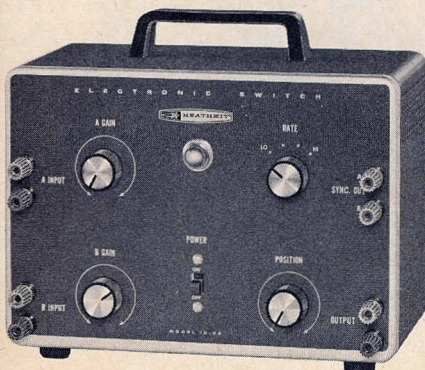
- Kit PK-1, 1 lb. \$4.95

Heathkit Electronic Switch . . . For Dual-Trace Scope Operation

- Permits display of two separate signals on CRT screen • Displays signal levels as low as 0.1 volt • ±1 db, 0-100 kHz response • Separate gain controls for each channel • All-electronic switching • Four switching rates—150, 500, 1500, and 5000 Hz • Sync output to control scope sweep

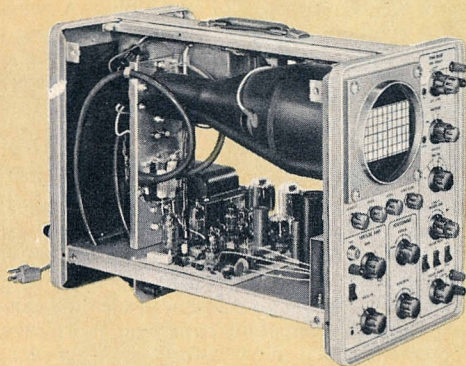
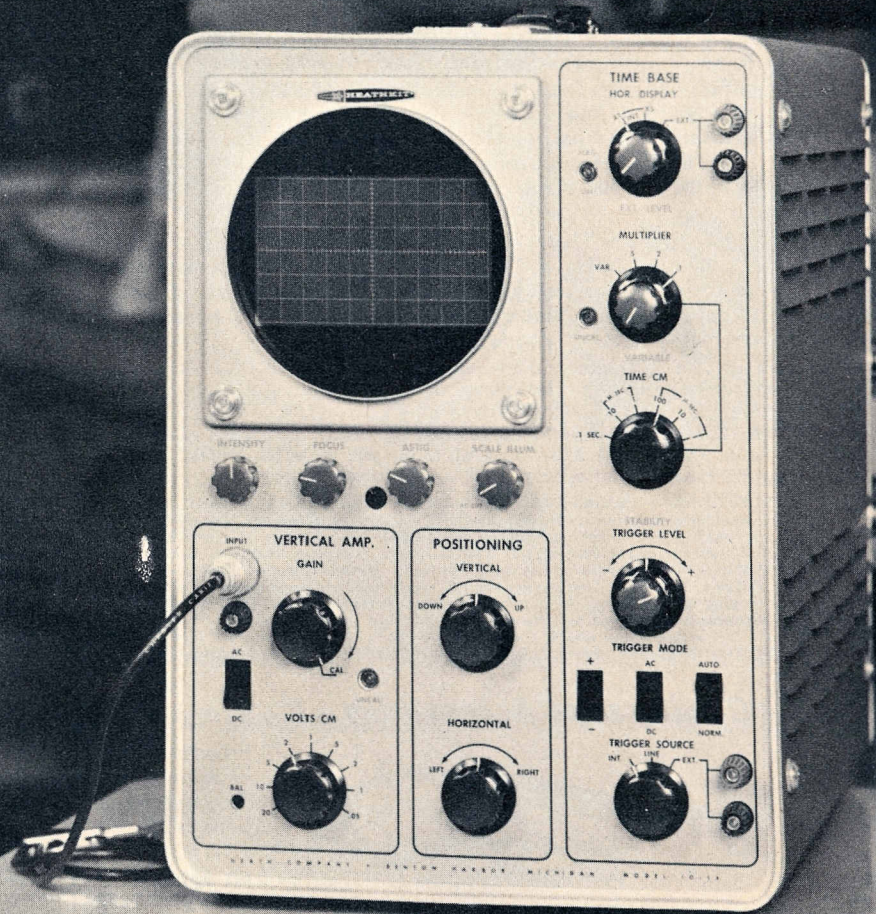
Lets You View Two Signals At Once! With this handy scope accessory you can visually observe two different signals on your scope screen at the same time. A typical example of its use is to simultaneously observe a signal or wave-form as it appears at both the input and output stages of an amplifier. A position control is provided to superimpose or separate the two signals for comparison purposes or individual study. Both signals are produced alternately at the output at any one of four switching rates provided. Separate gain controls for each channel and sync output to lock scope-sweep or time-base to signal frequency add extra operating convenience. Functions at signal levels as low as 0.1 volt. Simple to use, just connect signal sources to "A" and "B" inputs on the electronic switch and the output directly to the vertical input of the scope. Export model available for 115/230 VAC, 50-60 Hz; write for prices.

- Kit ID-22, 7 lbs. \$23.95



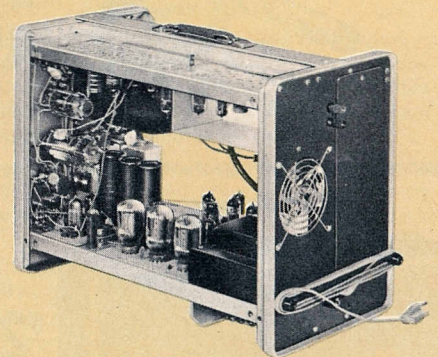
ID-22
\$23.95

Heath Research... Creating Innovations In Electronics For Two Decades



Kit
IO-14
\$299⁰⁰

Assembled
IOW-14
\$399⁰⁰



Component Layout Which Can Be Appreciated By The Most Critical Kit Builder. The high-quality performance of the IO-14 is matched by its neat, clean parts layout, and its straight-forward assembly procedure. Components are contained in eight packages which are opened in sequence with eight phases of assembly. The modern circuitry and select components assure a sharp, bright trace . . . provide 4 kv accelerating potential, high-nickel alloy CRT shield, and precision, cable-type, matched magnetic-core delay lines for fast-rise-time pulse analysis.

Feature For Feature . . . Price For Price . . . The World's Best Buy in DC Scopes. 5 fiberglass laminate circuit boards, 2 wiring harnesses, a heavy-duty, well rated power transformer, forced-air cooling, and "U" girder, all aluminum construction, plus Heath engineering know-how have made this the best value in DC, triggered-sweep scopes. The rear access door allows direct connection of deflection plates. Also shown above are Z-axis terminals, holders for 3-wire line cord, and circuit breaker reset button.

Heathkit® IO-14 Professional DC Oscilloscope

... The New Standard For Performance And Value In Precision Test Instruments

Nineteen Years Ago Heath Broke The Price Barrier On Oscilloscopes With A Low-Cost Scope For Hams, Hobbyists, And Service Technicians. Now Heath Breaks The Price Barrier Again! . . . With A Precision, Fast-Response, Triggered Sweep, Delay Line Oscilloscope For The Serious Experimenter, Industrial Or Academic Laboratory, And Medical Or Physiological Research Laboratory.

• 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—capable of faithful reproduction of signal waveforms far beyond the bandwidth of the scope • Calibrated vertical attenuation • Calibrated time base • Forced air cooling • Input for Z axis modulation • Input for direct access to vertical deflection plates • Easy circuit board construction & wiring harness assembly • Components are packaged separately for each phase of construction • Easy to align • Fulfills many production and laboratory requirements at far less cost than comparable equipment—particularly scopes capable of fast-rise waveform analysis • No special order for export version required—wiring options enable 115/230 volt, 50-60 Hz operation

HERE IS A TRULY SOPHISTICATED INSTRUMENT . . . designed with modern circuitry, engineered with high quality, close-tolerance components, and capable of satisfying the most critical demands upon its performance specifications. The ultra-stable IO-14 far outperforms oscilloscopes with "sync'd" recurring sweeps in such work as the analysis of signal waveforms in television circuitry. Its triggered sweep feature enables it to accurately display randomly occurring waveforms in the many applications for which continuous sweep scopes must operate on a strict "hit-or-miss" basis. Therefore, even TV servicemen will find that the additional investment for a scope of this quality is more than justified by its advantages.

THE IO-14 FEATURES PRECISION COAXIAL DELAY-LINE CIRCUITRY . . . the type of delay circuitry considered by electronic engineers to be the most desirable for high linearity and maximum usable frequency response. The 0.25 microsecond delay circuitry in the vertical channels of the IO-14 allows the horizontal sweep to trigger "ahead" of the incoming vertical signal . . . allows the leading edge of the vertical signal waveform to be accurately displayed. To not only provide this feature in the IO-14, but to assure its "state-of-the-art" quality, as well, Heath engineers chose coaxial-type delay lines capable of reproducing sharp rise-time signals far beyond the high frequency specifications of the oscilloscope. This assures the utmost ability for critical analysis of signal waveform characteristics . . . right up to the limits of the published specifications.

THE IO-14 PROVIDES FEATURES YOU EXPECT ONLY IN HIGH PRICED OSCILLOSCOPES. For example, a calibrated vertical attenuator, a 5X sweep magnifier, and a magnifier indicator lamp . . . external sweep input and external trigger input . . . and many others, including an accurately engraved graticule with variable intensity lighting for optimum results in 'scope photography.

PRECISION SMALL PARTS . . . 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 fiber glass laminate.

BUILT FOR CONTINUOUS USE. The IO-14's cabinet is heavy gauge aluminum. The chassis and components are well supported structurally. The CR tube is shielded against stray magnetic fields, and forced air ventilation allows the IO-14 to be operated continuously under the demands of industrial use. The power transformer is husky, well rated, and constructed with a copper band enclosing the windings & iron to limit the external magnetic field. Here is a scope that's built to "take it."

SPECIAL FACTORY-ASSEMBLED MODEL AVAILABLE FOR BIOLOGICAL & PHYSIOLOGICAL OR INDUSTRIAL APPLICATIONS . . . features a long-persistence (P-7) phosphor. Here is an exceptionally capable instrument for electro-cardiography, electroencephalography, for studying the electrical activity of muscles and nerves, and for study of the electrophysiological responses in plants . . . when it is operated with a low-noise biological-type pre-amplifier

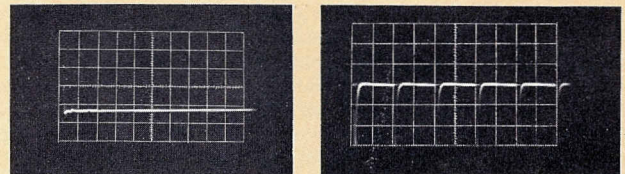
with a gain 1000 to 5000. Suitable pre-amplifiers are available from the major manufacturers of electronic equipment for medical and physiology laboratories, such as Phipps & Bird, Inc. of Richmond, Va. When choosing this equipment, check specifications for input impedance, output impedance, gain, frequency response, common mode rejection, and noise level with reference to IO-14 specifications given here. Recommended specs should meet or exceed Phipps & Bird pre-amplifier No. 7092-620 with power supply No. 7092-630. The Heath IO-14S Oscilloscope features identical specifications to the IO-14 kit version, except for the long persistence phosphor, which is valuable for the applications described above and for industrial uses requiring slow sweep rates.

HAS THE HEATHKIT IO-14 ACHIEVED ACCEPTANCE IN THE FIELD? Here's the response we received from an industrial user . . . Swiss Controls & Research Inc., Michigan City, Indiana. Engineer, Adam L. Keller says, "May I take this opportunity to congratulate your company on the fine job you have done on your new IO-14 oscilloscope kit. In my opinion there is not a scope on the market which can compare with your fine new product, at least until you start talking 4 or 5 times the price. We are most satisfied with the instrument in every respect . . . your IO-14 is probably the finest kit you have ever put on the market, bar none. I hope to soon be able to order another for use in our Production Inspection Department. Keep up the good work."

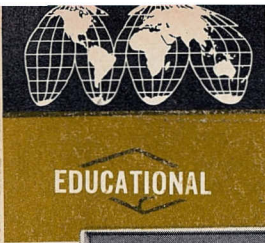
Order The Heathkit IO-14 For The Best Value In DC, Triggered-Sweep Oscilloscopes On The Market . . . bar none!

Kit IO-14, 53 lbs., Express or Motor Freight, no money dn., \$28 mo. **\$299.00**
Assembled IO-14, 47 lbs., Express or Motor Freight, \$40 dn., as low as \$23 mo. **\$399.00**
Assembled IO-14S, 47 lbs., Express or Motor Freight (with P7 phosphor) **\$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 uuf. Signal delay: 0.25 microsecond. Attenuator: 9-position, compensated, calibrated in 1, 2, 5 sequence from 0.05 v/cm. Accuracy: $\pm 3\%$ 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 $\pm 3\%$ 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 $\pm 5\%$ 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; $\frac{1}{2}$ cm to 6 cm display. External: 0.5 volts to 120 volts peak-to-peak. 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 10 $\frac{1}{2}$ " W x 22" D includes clearance for handle and knobs. Net weight: 40 lbs.

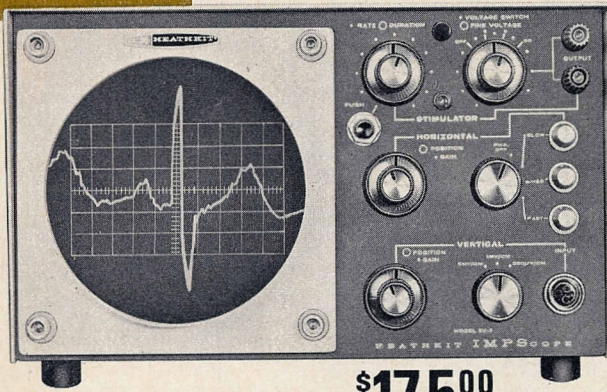


Here Actual Signal Waveforms Indicate Scope Quality. The waveform on the left (a 100 kc fast rise square wave) illustrates the capability of the IO-14 to clearly display fast-rise signals. Mode is "triggered" "AC". Time base is 0.2 microseconds per centimeter. The entire leading edge of this signal is 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 unretouched photographs of signals produced by Tequipment® Type C-1 scope calibrator. Scope sensitivity for both waveforms is 0.2 volts/cm.



Heathkit® Educational Instruments For

Heathkit IMPScope . . . The Biological Oscilloscope That Has Revolutionized The Teaching Of Life Science . . . Lets Students "See" Physiological Phenomena



\$175⁰⁰
EV-3

WHAT IT DOES

IMPScope With Accessories . . . • Clearly Demonstrates EKG • Shows Human EKG • Shows Frog Sciatic Nerve Impulse • Shows Frog EKG • Shows Plethysmographic Pressure Display • Plus Many More Lab And Classroom Uses



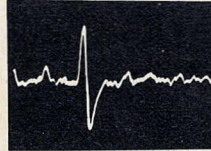
Included With IMPScope

- Input termination and calibrator
- Human EKG electrodes • EKG paste • Connecting leads

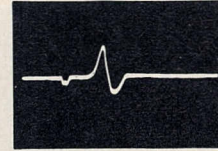
Kit EV-3, 27 lbs. . . no money dn., \$17 mo. \$175.00
Assembled EVW-3, 28 lbs. . . no money dn., \$25 mo. \$265.00
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

EV-3 SPECIFICATIONS—VERTICAL AMPLIFIER: Sensitivity: Switch selected; 200 microvolt, 1 millivolt, and 5 millivolts per centimeter. Variable from 200 microvolts to 5 millivolts per centimeter. Bandwidth: ±3 db from 0.25 to 2500 Hz. Input: Balanced. **HORIZONTAL:** Sweep frequency (rate per centimeter): Slow, 0.15 to 5 sec. Medium, 7.5 milliseconds to 0.2 sec. Fast, 0.5 to 1.0 milliseconds. Stimulator: Rate: 6 to 30 stimuli per second. Recurrent stimulus or single stimulus with pushbutton—indicator light on front panel. Stimulus duration: 0.25 to 6 milliseconds. May be increased with an external capacitor—jack provided. Power requirements: 70 watts, 105-125 volts, 50/60 Hz A.C. Dimensions: Overall, 11 1/2" W x 7 1/2" H x 19 1/2" D. Net weight: 17 1/2 lbs.

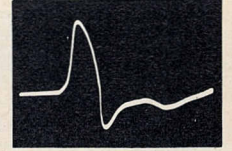
- Brings the most recent physiological instrumentation techniques to the student in the classroom • A complete teaching package consisting of a high-gain oscilloscope with built-in stimulator, laboratory sourcebook, and many accessories • Priced for multiple lab usage in biology & physiology courses 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 available in either easy-to-assemble kit form or factory assembled & tested • Complete set of human EKG electrodes and EKG paste supplied • Not intended for medical diagnostic use



Frog EKG. IMPScope accessories include electrodes for EKG's of frogs and other organisms.

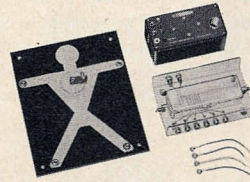


Muscle Potentials. IMPScope shows nerve and muscle action potentials (frog gastrocnemius muscle).



Bioelectric. IMPScope shows bioelectric phenomena in plants (175 mv action potential of Nitella internode).

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!



IMPScope Accessories

\$35⁰⁰
EVA-3-1

- Accessory Package**
- Plethysmograph • Nerve chamber • EKG vector dolly • Frog EKG electrodes

EVA-3-1, Accessory Package: Includes nerve chamber, vector dolly, plethysmograph, frog electrodes & manual of instructions. 4 lbs. . . \$35.00
EVW-3-1, Factory Assembled Accessories, 3 lbs. \$50.00

Heathkit Educational Analog Computer . . .

Brings Analog Computer Electronics

Within The Budget Of Nearly Everyone

- 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

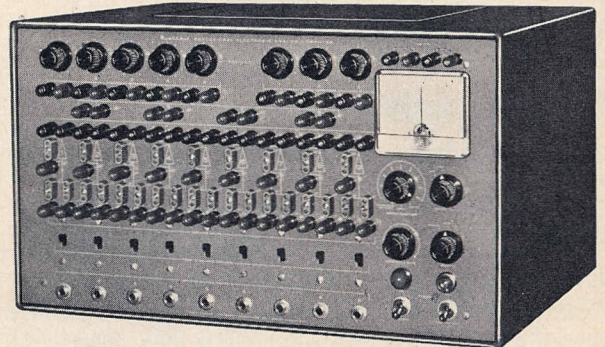
Industries And Universities Find The EC-1 Ideal for training computer operators and engineers. As a training device, it frees more advanced computer facilities for more sophisticated problem solving.

The EC-1 Computer Operational Manual Discusses Many Problem Setups . . . including problems as complex as the simultaneous second order differential equations for the flight of a projectile such as:

$$\frac{d^2x}{dt^2} + \frac{C}{M} \frac{dx}{dt} = 0 \text{ and } \frac{d^2y}{dt^2} + \frac{C}{M} \frac{dy}{dt} + g = 0.$$

The problem of a bouncing ball is solved, and coefficients and parameters such as gravity, mass, viscosity of the medium, elasticity of the ball, flattening of the ball on impact, and drop height can be varied to show their effects on the flight path, change of momentum, etc.

The EC-1 Is A Highly Capable And Versatile Device. Its capabilities can be further extended through the addition of special function generators, "patched in" to perform non-linear or discontinuous functions. A large assortment of precision components and patch cords is included for setting up problems. Problem results may be sampled from each of the operational amplifiers and read on the built-in panel meter or on an external readout device such as a DC oscilloscope or pen recorder,



EC-1
\$199⁹⁵

enabling the effects of varying mathematical parameters to be dramatically illustrated. EC-1 is easy to assemble and operate. Complete instructions are supplied.

Kit EC-1, 48 lbs. \$199.95
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 volts, 50/60 Hz, 100 watts. Dimensions: 19 3/8" W x 11 1/2" H x 15" D.

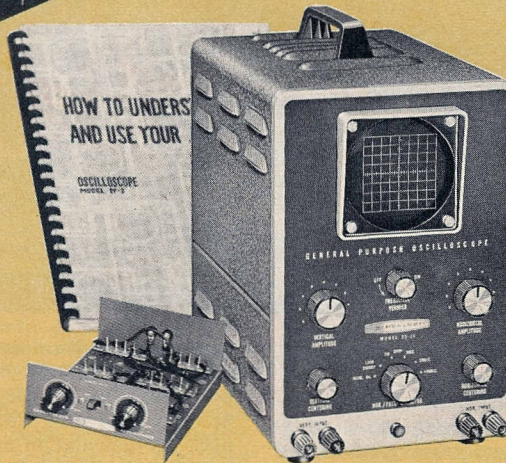
Large ES-Computer and individual components still available. Address your inquiries to Heathkit, Cooksville, Ontario, Canada.

The Classroom And Home Study



EF-1
"Text & Chassis" **\$8⁹⁵**

EF-1-4
"Text & Instrument" **\$39⁹⁵**



EF-2
"Text & Chassis" **\$9⁹⁵**

EF-3
"Text & Instrument" **\$61⁹⁵**

EF-2-3
"Text & Instrument" **\$66⁹⁵**

"How To Understand And Use Your Vacuum Tube Voltmeter"

- Combination kit/textbook project • Simplified basic theory in everyday language
- Interesting experiments support text material • Information applies to all VTVMs • No previous electronic experience required • Buy in combination with IM-11 or IM-13 VTVMs & save

A Complete Course On The Theory And Applications Of The VTVM . . . discusses the VTVM in everyday language. Ideal for beginners, since it assumes no prior knowledge of electronics, yet it does not "talk down" to the electronics technician or experienced student. Excellent unit for a laboratory course in basic electronics, or use it for self-teaching.

You Learn By Doing. Recognized as the most effective method of teaching. Experiments which illustrate and clarify the text material are performed with the special power supply which is included. This "learn-by-doing" method, and the discussion of general "trouble-shooting" principles prepare you for independent investigation of new problems as they arise. Arrangement of textbook topics provides the most value for the beginner and professional alike. For added savings order with IM-11 or IM-13 VTVM's!

Kit EF-1, Text and special power supply (for VTVM owners), 3 lbs. **\$8.95**

Kit EF-1-3, includes EF-1 and IM-11 VTVM, p. 44, 8 lbs. . . . No money down, \$5 mo. . . **\$32.50**

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Manuals only for EF-1 (single copy) . . . **\$5.00**
 . . . (10 or more copies) . . . **\$3.00 each.**

"How To Understand And Use Your Oscilloscope"

- A kit/textbook project • Interesting "learn-by-doing" experiments • Basic theory explained in everyday language
- Solderless spring-clip connectors permit fast, simple circuit changes during experiments • Big 169-page textbook remains a valuable reference source • Ideal for beginners and professionals

Most Popular Kit/Textbook Course . . . provides a well-organized, comprehensive introduction to electronics through the operation, circuitry, and use of the oscilloscope. Even for professionals the "EF-2" Course is a fresh, new approach to the basic theory and application of the oscilloscope. It clears away the "mystery" of the oscilloscope which sometimes haunts students in electronics, and provides an excellent reference text, useful for years to come.

You Learn The General Principles Of Electronics And Troubleshooting through laboratory experiments with the oscilloscope and test chassis. Use of the special test chassis clarifies the theory by dramatically illustrating each point as it is discussed in the text. "Solderless" spring clip connectors allow fast, easy circuit changes and permit re-use of the parts again and again, once the unit is initially constructed. Order either the IO-21 or IO-12 oscilloscope and enjoy extra savings.

Kit EF-2, Text and special chassis & parts, 4 lbs. **\$9.95**

Kit EF-2-3, includes EF-2 and IO-21 Oscilloscope, page 60, 16 lbs. . . . No money down, \$7 mo. **\$66.95**

Kit EF-2-4, includes EF-2 and IO-12 Oscilloscope, page 61, 28 lbs. . . . No money down, \$9 mo. **\$87.95**

Manuals only for EF-2 (single copy) . . . **\$5.00**
 . . . (10 or more copies) . . . **\$3.00 each.**

"How To Understand And Use Your Signal Generator"

- Text written in easy-to-understand, everyday language • Interesting "learn-by-doing" experiments • A kit/textbook project • Applies to most signal generator types • Text remains a valuable reference source • Excellent for high school or college-vocational courses in electronics

Written By An Electronics Teacher For Use In The Classroom, For Self-Teaching, Or As A Reference For The Electronics Service Technician. The EF-3 Technical Applications course consists of a complete, thorough discussion of basic electronics; the theory involved in oscillators, power supplies, and other circuits included in modern signal generators; and the applications of signal generators to AF circuit analysis, RF alignment, FM alignment, and troubleshooting. The text describes the Test Chassis And Parts Assembly and then uses this equipment for practical exercises in applying the theories discussed. The student performs interesting experiments using the Test Chassis and the Signal Generator chosen. Special "solderless" spring-clip connectors allow circuit changes to be made quickly and easily, once the kit is initially constructed. The Textbook contains a wealth of information and serves as a valuable reference, once the course has been completed. The perfect addition to the service technician's library.

Kit EF-3, Text and special test chassis, 4 lbs. **\$11.95**

Kit EF-3-2, Includes EF-3 and IG-102 Signal Generator, pg. 51, 10 lbs. . . . No money down, \$5 mo. **\$37.95**

Kit EF-3-3, Includes EF-3 and IG-82, pg. 52, Sine-Square Generator, 18 lbs. . . . No money down, \$7 mo. **\$61.95**

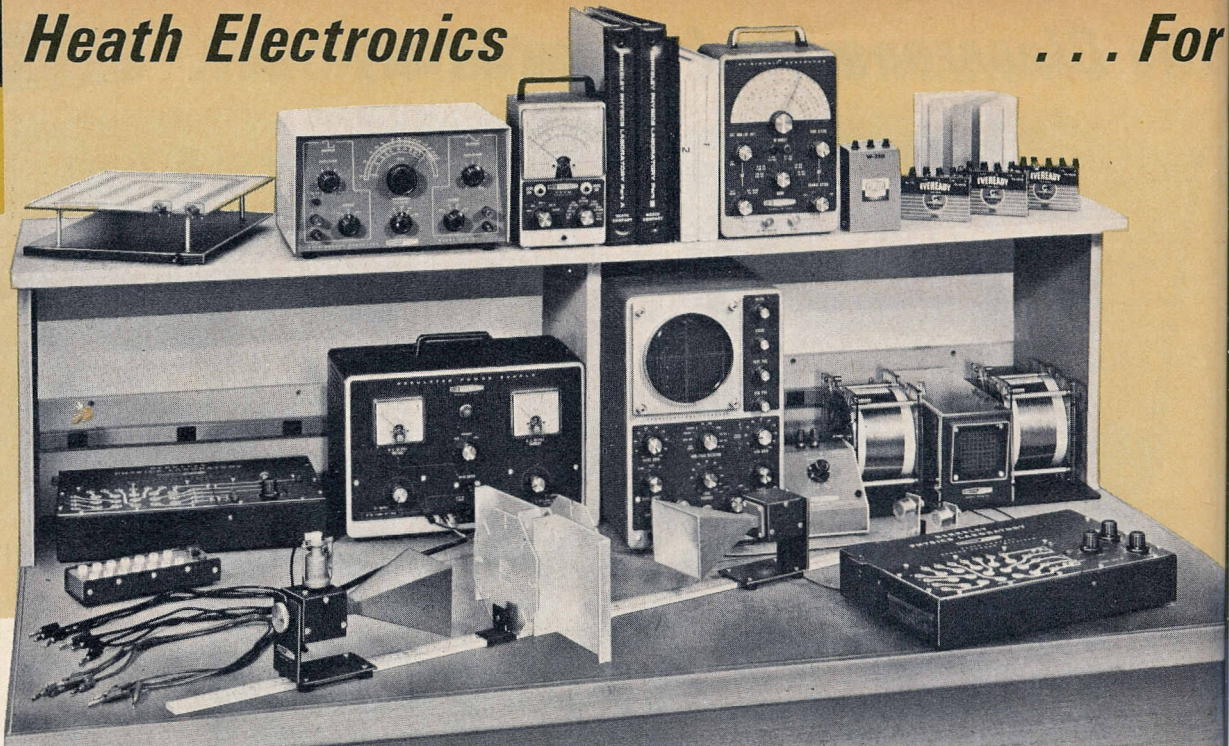
Manuals only for EF-3 (single copy) . . . **\$5.00**
 . . . (10 or more copies) . . . **\$3.00 each.**



EDUCATIONAL

Heath Electronics

... For



Berkeley Physics Laboratory Now With Parts A & B

Heath, Manufacturer Of Test Instruments & Materials As Used At Berkeley . . . now provides complete instrumentation facilities for outfitting Berkeley-type college physics laboratories. One basic Berkeley Physics Laboratory station includes all the instruments needed by two-student groups to perform all of the experiments of the Berkeley course. Special component groups for Parts A, B & C, of course can be supplied separately as they continue to become available. Order the instruments, plus the components for Parts A & B for initial outfitting.

A Modern And Complete Lab System . . . The Berkeley Physics Laboratory Part A consists of six high quality test instruments and two laboratory component sets plus battery set. Each instrument is rated for professional research and testing and will provide classroom experience comparable to the modern electronics or research laboratory. The component sets, test chassis and cathode ray tube with deflection coils, are up to date in every respect, and reflect the leadership in electronics and instrumentation gained by Heath. All units meet the instrumentation and power requirements for the Berkeley Physics Laboratory.

Complete Specifications On Each Instrument & Component . . . are shown in the FREE Berkeley Physics Laboratory brochure supplied by Heath. The Berkeley Physics Laboratory Manual is available from McGraw-Hill Book Co. and Heath Co. And only Heath offers a complete instrumentation manual (The Heath Berkeley Physics Instrumentation Manual), showing both schematic and pictorial wiring diagrams for Berkeley Laboratory experimental setups, as well as complete descriptions of each instrument . . . write for this valuable manual! Part A, Order Nos. 595-764 & 7012P246 . . . \$2.00 Part B, Order Nos. 595-812 & 7012P297 . . . \$2.00

Berkeley Physics Course Text Book, Vol. I, Mechanics
EPP-11 Text Book Vol. I (McGraw-Hill) . . . \$5.50
Berkeley Physics Course Text Book, Vol. II, Electricity
EPP-12 Text Book Vol. II (McGraw-Hill) . . . \$5.50
Kit EP-100A, complete 2-student lab station with Part A, 113 lbs. \$399.00
Assembled EPW-100A, complete 2-student lab station with Part A, 113 lbs. . . . \$559.00
Export model available for 115/230 VAC, 50-60 cps; write for prices.
Kit EP-100B, complete 2-student lab station with Part B, 100 lbs. \$439.00
Assembled EPW-100B, complete 2-student lab station with Part B, 100 lbs. . . . \$599.00

Heath Basic Lab Instruments

- A Regulated Power Supply**—page 57
Kit IP-32 \$56.95
Wired IPW-32 \$84.95
- B Laboratory 5" Oscilloscope**—page 61
Kit IO-12S \$79.95
Wired IOW-12S \$134.95
- C RF Signal Generator**—page 51
Kit IG-102S \$30.00
Wired IGW-102S \$60.00
- D Sine-Square Wave Generator**—page 52
Kit IG-82 \$51.95
Wired EUW-27 \$94.00
- E Transistorized Power Supply**—page 72
0-35 VDC @ 200 ma max.
Wired EUW-17 \$20.00
- F Vacuum Tube Voltmeter**—page 44
Kit IM-11 \$24.95
Wired IMW-11 \$39.95

Heath Components For Part A

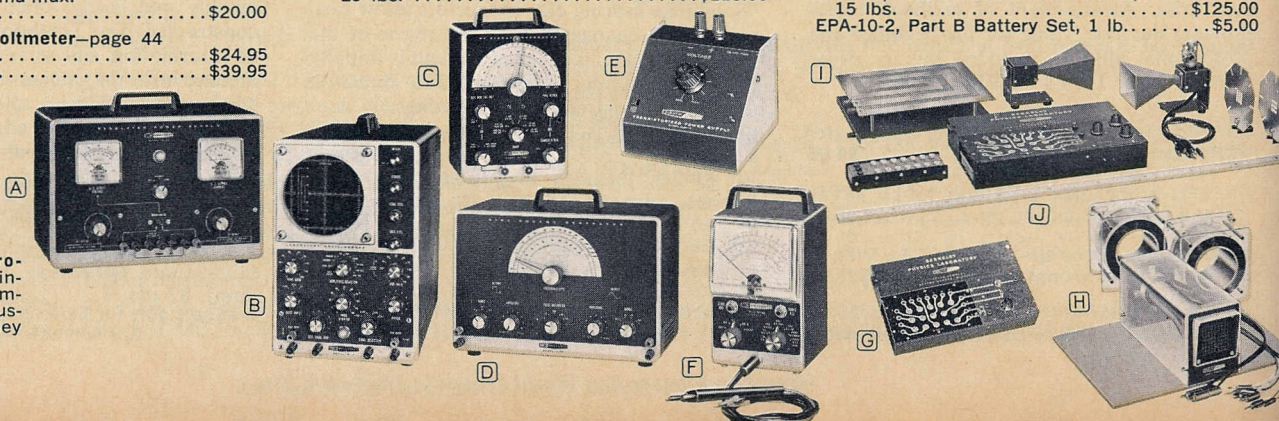
- G Test Chassis & Small Parts Set** . . . standard "pig-tail" small parts are used . . . no specialized connectors!
EPW-14, Test Chassis & Small Parts Set, 12 lbs. \$60.00
EPA-10-1, Battery Set Part A, 2 lbs. \$ 5.00
- H Cathode-Ray Tube & Deflection Coil Set** . . . The cathode-ray tube enclosure is completely transparent yet it can be easily disassembled for Berkeley experiments. Deflection coils are virtually indestructible—a real advantage since the weight increases the chance of damage from abuse. Factory wired.
EPW-24, Cathode-Ray Tube & Deflection Coil Set, 29 lbs. \$115.00

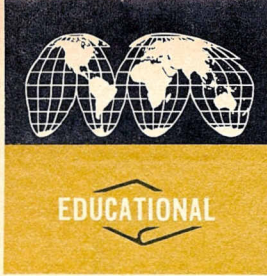
Heath Components For Part B

- I Microwave Transmitter & Receiver Set** . . . designed by Heath specifically for the Berkeley Physics Laboratory, this equipment was extensively tested by Heath engineers. The result: Large horn antennas assure top efficiency. Empirically designed diffraction & polarization plates yield well defined data. Functional design means convenient lab setups. Factory wired.
EPW-25, Microwave Transmitter & Receiver Set, 10 lbs. \$115.00
- J Test Chassis & Accessories** . . . The Test Chassis for Part B also features ordinary "pig-tail" small parts . . . assures an open-ended laboratory, includes transmission line and delay line.
EPW-15, Test Chassis & Accessories, 15 lbs. \$125.00
EPA-10-2, Part B Battery Set, 1 lb. \$5.00

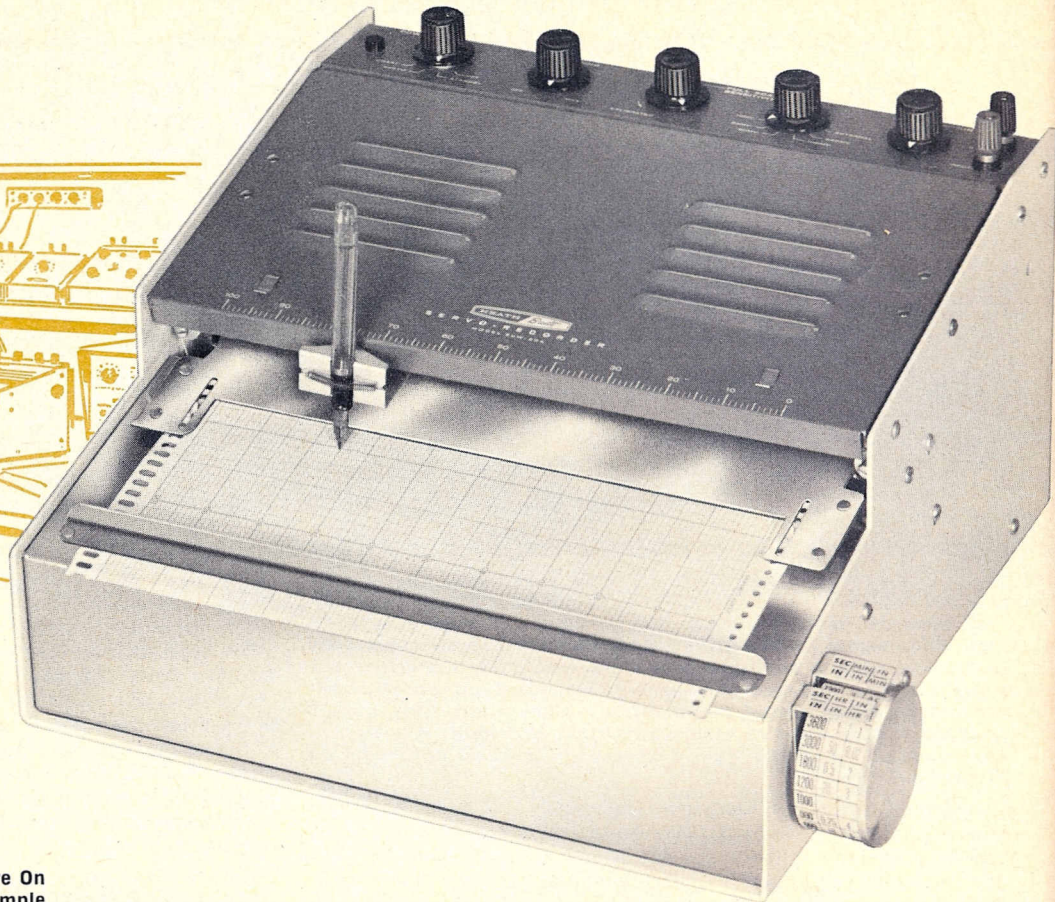
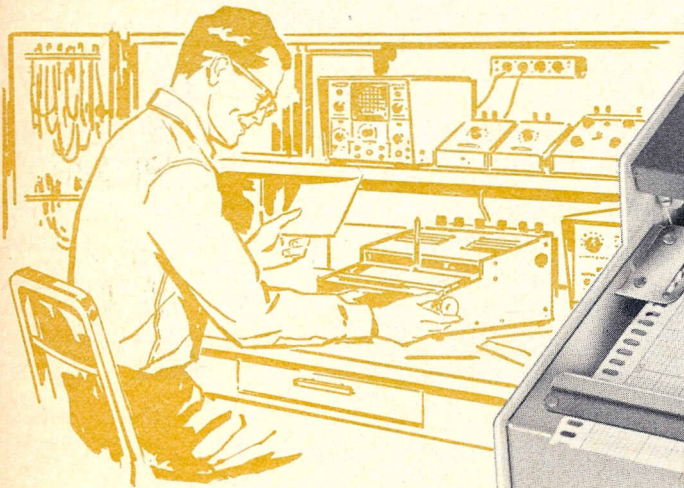


Send For Free Brochure! Describes instruments and components, plus a discussion on the "Berkeley Concept."





The Famous Heath Malmstadt-Enke Servo-



EUW-20M
\$289⁰⁰

All Operating Controls Are On One Panel, Providing A Simple And Yet Complete Control Center.

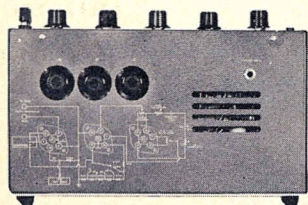
21 Speeds Instantly! See The Complete Dial Scale On The Opposite Page.



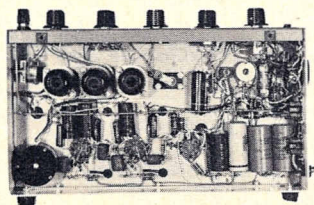
The Heath Malmstadt-Enke Servo-Chart Recorder . . . The Ultimate In Functional Design . . . Factory Assembled . . . Thousands In Use In A Myriad Of Unique Applications

- True potentiometric null-point balance on all ranges
- Full provisions for plug-in modular accessories
- 10" linear scale
- 0.1 sec./inch response
- 5 ranges of input sensitivity—10, 25, 50, 100, & 250 mV
- Repeatability 0.2%—accuracy better than 1%
- Time scale easily changed with the turn of a knob—21 chart speeds from 5 seconds/inch to 2 hours/inch (12 inches/min. to

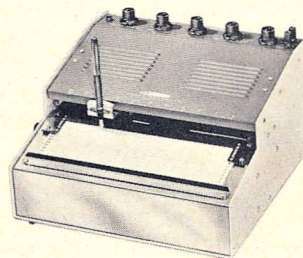
- 0.5 inches/hour)
- Auxiliary input to chart drive permits electronic synchronization of time base to external events or control parameters—enables continuous variation in chart speed from 0 to 12 inches per minute
- Uses inexpensive, practical cartridge pen
- Completely assembled & tested



Standard 5-pin connectors and circuit diagram screened on the back panel permit easy modification for versatile applications . . . permit use of plug-in modules for specific requirements, such as pH module EUA-20-11.



Back View with cover removed shows neat layout of circuit components. Every Heath recorder is supplied with a manual which describes this circuitry in detail. Since all components and small parts are readily accessible, this is an ideal instrument for use in teaching servo design.



Order Model EUW-20A for single-speed version of this famous strip-chart recorder. EUW-20A is supplied with 2 inches/min. motor only . . . see listing for extra motors available. All other specifications are identical to EUW-20M.

EUW-20 CHART PAPER PRICES (EUA-445-8)

Quan.	Price ea.
1-9 rolls	\$4.50
10-24 rolls	\$4.00
25-99 rolls	\$3.50
100-199 rolls	\$3.00
200-500 rolls	\$2.50

Write for prices on orders exceeding 500 rolls.

Chart Recorder . . . Now With 21-Speed Chart Drive

Heathkit Servo-Chart Recorders Offer Precision Recording Facilities At Low Cost

VERSATILITY FOR RESEARCH AND EDUCATION . . . the Heath models EUW-20M and EUW-20A Servo Chart Recorder are precision, laboratory-type, self-balancing, potentiometric instruments designed to provide direct readout of signals (representing experimental phenomena) in the range 10 to 250 millivolts (full scale readings). High quality is emphasized throughout the instruments. The characteristic Heath Malmstadt-Enke design includes many unique features . . . permits simple, straight-forward modification of the recorders for special requirements. The Heath EUW-20M and EUW-20A Recorders provide chemists, physicists, engineers, and other scientists with an accurate, dependable instrument that fulfills a multitude of research, education, and control applications. Typically these instruments are used for recording pressure, speed, temperature, strain, pH, metallic ion concentrations, percentage of oxygen, intensity of light radiation, and many other phenomena when used with suitable transducers and modular circuitry.

PLUG-IN ADAPTER CHASSIS AVAILABLE. A blank adapter chassis (EUA-20-1) is available as an accessory for the construction of plug-in modules to convert the recorder for specific laboratory functions. One such module (factory assembled) converts the EUW-20M to a versatile and highly sensitive direct-reading and/or multi-speed recording pH/MV electrometer (see page 72). Electronics of your own design can easily be added through the plug-in modules to provide facilities such as: a servo constant-current source, a self-balancing Wheatstone bridge, an integrating recorder, a recording microammeter, and other devices with servo-chart recorder readout.

FULL-FEATURED PERFORMANCE. Uses standard, easily-obtained cartridge-type pen or popular felt tip pen. Multi-colored chart plots can be obtained quickly and simply by merely changing the clip-on pen. Other features include a convenient pen lift, rapid chart advance, paper tear-off guide and a special standby circuit to prolong the operation of limited-life components, such as the mercury reference cell and chopper. The impedance reduction damping feature of the recorder makes it possible to introduce damping into the servo system without appreciably increasing the dead zone. Additional chart-speed motors are also available at low cost for Model EUW-20A recorders. Easy access to motor mounts permits fast, easy change to other speeds. Model EUW-20M provides a selection of 21 chart speeds from 12 inches per minute to 1/2 inch per hour for convenient matching of read-out time base to the time base of the experimental phenomena . . . plus, the capability of slaving the chart speed (Y coordinate) to experimental parameters or events. The Multi-Speed Chart Drive is described separately on this page. Send for the free brochure, which includes a block-diagram type of discussion on the operation of this unit.

ORDER THE HEATH EUW-20M MULTI-SPEED SERVO-CHART RECORDER . . . for outstanding versatility and accuracy, for the ultimate in functional design—all at the lowest cost.

EUW-20M, Multi-Speed Servo-Chart Recorder, 26 lbs., (RE A Express or Motor Frt. only) **\$289.00**
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

EUW-20A, Single-Speed Chart Recorder, 23 lbs., (RE A Express or Motor Frt. only) **\$199.00**

EUA-20-1, Blank plug-in adapter chassis, 5 lbs. **\$9.00**

Chart Drive Motors for EUW-20A Recorders.

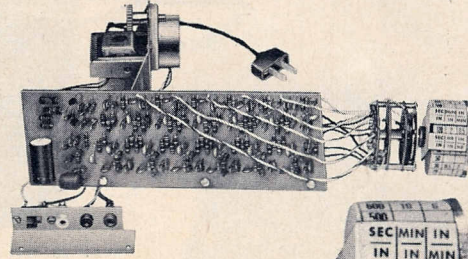
Wt. 1 lb. Price ea. **\$13.00**

EUA-20-2	.1 inch/min.	EUA-20-5	1.0 inch/min.
EUA-20-3	.2 inch/min.	EUA-20-9	12.0 inch/min.
EUA-20-4	.5 inch/min.	EUA-20-10	2.0 inch/hour

EUW-20M SPECIFICATIONS—Chart Paper: Grid width, 10". Length, 120 foot roll Markings, 0-100, right to left. **Chart Speed:** 5 seconds per inch to 2 hours per inch in 21 speeds, with internal signal. Any speed up to 5 seconds per inch with external signal. [See complete EUA-20-26 specifications.] Model EUW-20A features standard speed 2 inches per minute only with additional chart-drive motors available. **Chart Span:** Five fixed ranges: 10, 25, 50, 100, and 250 mv, plus a sensitivity control to permit adjustment for any value from 10 to 250 mv. Also external position available for special plug-in ranges. **Pen:** Standard fountain pen, cartridge-type. **Balancing Time:** 0.1 second per inch, 1 second full scale (10"). **Error** (includes dead zone): Less than 1% of full scale for all ranges. 10 to 250mv. **Repeatability:** 0.2%. **Maximum Source Resistance:** 50 K ohm. **Reference System:** Mercury cell. **Reference Cell Life:** 300 hours (approx.). **Power Requirements:** 105-125 volts 60 Hz AC; 80 watts. **Dimensions:**

Heath Multi-Speed Chart Drive Provides 21 Speeds At The Twist Of A Knob

DIAL SCALE SHOWS CHART SPEEDS ▶



EUA-20-26
\$89.00

Dial Scale On Knob

- All solid-state electronics • Instantaneous selection of 21 accurate speeds from 5 seconds to 2 hours per inch (12 inches/minute to 0.5 inches/hour)—when using internal line frequency signal • Unlimited variation in speeds up to 12 inches per minute when using an external chart drive signal • 21-position chart drive switch features five rate scales—seconds per inch, minutes per inch, hours per inch, inches per minute, and inches per hour. All chart speeds are as accurate as 60 Hz AC line signal, when using internal drive signal • Auxiliary input terminals enable the chart motor to be programmed by external chart-drive signals • Output signal for synchronizing experimental events or synchronizing other recorders • Can be installed in any Heath EUW-20A Servo-Chart Recorder or EUW-301 Recording pH Meter/Electrometer • Includes complete, detailed instruction manual, giving step-by-step procedure for installation in Heath recorders • Factory wired and tested

EUA-20-26, Multi-Speed Chart Drive for installation in Heath EUW-20A Recorders & EUW-301 pH Recorders, 4 lbs. **\$89.00**

EUA-20-26 SPECIFICATIONS—Chart Speeds: 5 seconds to 2 hours per inch in 21 speeds, with internal signal. Any speed up to 5 seconds per inch with external signal. **External input:** Input terminals for external chart drive signals. **External signal requirements:** Sine Wave; 22 volts P-P min., 15-100 Hz; 3 volts P-P min., 100 Hz—10 kHz. Square Wave: 3 volts P-P min., 0-10 kHz with 20 usec max rise & fall time. Pulses: 0-10,000 pulses per second—with minimum amplitude dependent on pulse duration. **Auxiliary output signal:** 4 v. P-P square wave; 20 usec rise time & 0.2 usec fall. **Auxiliary output impedance:** 68 ohms. **Controls:** 21-position Chart Speed Switch & External-Internal signal switch. **Chart-Speed Switch Scale Calibration:** Calibrated in sec/inch, inch/min., inch/hour, min./inch & hours/inch. Calibrated speeds are: 5, 10, 15, 20, 30, 50, 60, 100, 120, 200, 300, 500, 600, 900, 1000, 1200, 1800, 3000, 3600, 6000, & 7200 seconds/inch—with additional calibration: 12, 6, 4, 3; 2, 1, 0.5, 0.02 & 0.01 inch/min.; and 36, 18, 12, 6, 4, 3, 2, 1, & 0.5 inches/hour, plus intermediate rates expressed in min./inch and hours/inch. **Components:** 32 diodes & 29 silicon transistors. **Power requirements:** 105-125 VAC 60 Hz 30 watts.

SEC	HR	IN
IN	IN	HR
7200	2	0.5
6000	100	0.01
3600	1	1
3000	50	0.02
1800	0.5	2
1200	20	3
1000		
900	0.25	4
600	10	6
500		
300	5	12
200		18
120	2	0.5
100		36
60	1	1
50		
30	0.5	2
20		3
15	0.25	4
10		6
5		12

SEC	MIN	IN
IN	IN	MIN



Write For FREE BROCHURE

Fully describes the Multi-Speed Chart Drive for Heath EUW-20A Servo Chart Recorders and EUW-301 pH Recording Electrometers. Includes block diagram and discussion of the "multi-speed" circuitry.

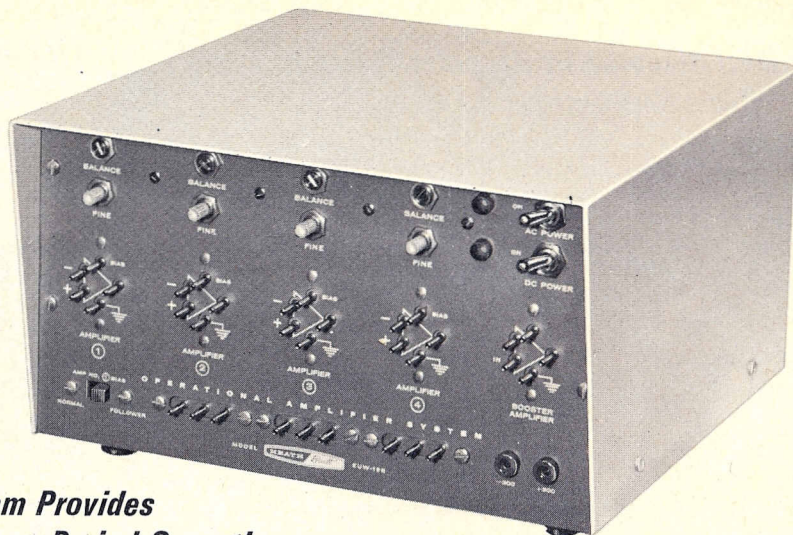


EDUCATIONAL

Heath-Built Malmstadt-Enke Lab



EUW-19B
\$135⁰⁰



New EUW-19B Operational Amplifier System Provides Improved Stability For Long-Period Operation

- Improved circuitry plus forced air ventilation for extra long-period stability
- Coarse & fine balancing controls 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 OA symbols to identify pin connections
- Optional modular chassis plug directly on front-panel connectors providing control, input, & feedback circuitry
- A complete self-contained unit with power supplies included
- Amplifier balance controls on front panel
- Fully assembled & tested

A COMPLETE INTEGRATED INSTRUMENT WITH 4 OPERATIONAL AMPLIFIERS, A BOOSTER AMPLIFIER, AND POWER SUPPLY . . . a single unit with plug-on control circuitry can perform several mathematical or control functions. (For example: The plug-on EUA-19-2 Polarography Module in combination with the Heath OA (Operational Amplifier System) provides the input, feedback, and control circuitry necessary for all the electronic facilities for controlled potential polarography . . . an analytical technique in electro-chemistry. These electronics include a highly linear sweep generator, a summing amplifier and voltage comparator circuit with initial potential control circuitry, and a current-summing amplifier.) In this example the mathematical functions performed by the OA's have a direct relationship to the control processes required for polarography. Many other experimental processes in physics and chemistry can be compared to mathematical functions, and these, too, can be performed electronically!

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. There are many valuable texts which discuss the use of operational amplifiers. See chapter eight of the Malmstadt/Enke text, "Electronics for Scientists;" (Heath Model No. EUP-11) for a detailed description of the capabilities of the OA.

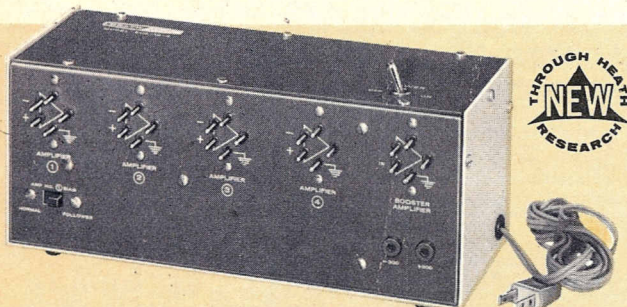
COMPLETE INSTRUMENT MANUAL INCLUDED . . . discusses the circuitry, theory, and operation of the EUW-19B.

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. **\$10.00**

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: Two ¼ ampere slow-blow fuses; one for the filament circuits, and one 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 6¾" H x 12⅞" D.



EUA-19-4
\$135⁰⁰

New Heath Operational Amplifier Stabilizer For Those Who Demand The Ultimate In OA Stability

- Connectors on both front and back panels enable simple, direct "plug-on" intermediate between Heath Operational Amplifier (OA) and its modular control circuitry
- Provides high stability—better than ± 0.1 mV/day
- Increases open-loop gain by a factor of 1000
- Factory assembled & tested—includes complete manual with operating procedure and circuitry discussed in detail

INCREASES THE ±5 mV/DAY STABILITY OF THE HEATH OPERATIONAL AMPLIFIER TO BETTER THAN ±0.1 mV/DAY. When experimental work requires long period or exceedingly high stability (such as a long series of runs in polarography at low concentrations), the Heath EUA-19-4 Stabilizer Module provides the ultimate in stability to OA systems. The "Stabilizer" is "plugged-in" as an intermediate stage between the EUW-19B Operational Amplifier and its modular control chassis (i.e. EUA-19-2). The open-loop gain is then increased to approximately 21,000,000 (by a factor of 1000), providing even greater precision to the OA circuit functions; the frequency response is maintained uniform, 0 to 100 kHz (with unity gain); and the average noise level is held to a minimum, 1 millivolt peak-to-peak average (at unity gain).

EUA-19-4, 6 lbs. **\$135.00**



Instruments . . . Individually Or As A Complete Lab

EUW-15 Universal Laboratory Power Supply

- Functions as a full-wave, half-wave, bridge or voltage doubler power supply
- Spring-clip connectors on jumper wires permit fast, simple circuit changes
- Partial schematic diagrams are screened inside the chassis for handy reference
- Separate power & high voltage on/off switches
- Fully assembled & tested

EUW-15, 14 lbs. \$75.00

The following specifications are for the EUW-15 Power Supply when it is wired for voltage-doubler operation.

EUW-15 SPECIFICATIONS: B+ voltage output: 200 to 350 volts DC regulated, at 0 to 100 milliamperes continuous. Filament voltage output: 6.3 volts AC at 3 amperes. B+ regulation: Output variation less than 1% from no load to full load at 300 volts. Output variation less than ± 1 volt for a ± 10 volt variation in the AC line input. B+ ripple: less than 10 millivolts rms ripple, jitter, and noise. B+ output impedance: Less than 10 ohms from 5-100,000 Hz. Divider voltage (unregulated): Approximately 500 v, 400 v, 300 v, 200 v, 100 v. Voltage divider: Internal, using five 1500 ohm 10 watt resistors . . . also can be used as a variable internal load. Power requirements: 105-125 volts, 50/60 Hz, 85 watts. Dimensions: 8 1/4" W x 6 1/2" H x 12 1/2" D.

EUW-16A Voltage Reference Source

- 0-100 volts DC output—Zener stabilized
- Accuracy 1% or 0.1 mv whichever is larger
- Direct reading—potentiometer type operation
- Polarity reversal & push-button zero switches
- Signal input position
- Fully assembled & tested

EUW-16A, 6 lbs. \$65.00

EUW-16A SPECIFICATIONS—Output voltage: 0-100 volts DC. Resolution: .1 mv on X1 range; 1 mv on X10 range; 10 mv on X100 range; 100 mv on X1000 range. Accuracy: $\pm 1\%$ for coarse switch setting and $\pm 2\%$ for fine control setting. Readout: Directly on three dials; Coarse Voltage, Fine Voltage, Range. Power requirements: 25 watts, 117 v. AC, 50/60 Hz. Dimensions: 5 3/4" H x 8 1/4" W x 8" D.

EUP-26 20,000 Ohm/Volt VOM

- Large 50-microampere meter, Diode Protected
- Weston model 980 Mark II Analyzer
- Battery powered for portable convenience
- Completely factory assembled & 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, Rx10000. Decibels (DB): -15 to +6, -1 to +20, +13 to +34, +25 to +46, +33 to +54. Accuracy: $\pm 2\%$ full scale on 1.6 to 800 V DC ranges. $\pm 3\%$ full scale on 4000 V DC range. $\pm 3\%$ on all AC ranges. ± 2 divisions, as read on the 0-16 scale, on all ohms ranges. Front Panel Controls: Function-Range switch. Ohms Adjust control. Meter Movement: 50 microamperes, 1125 Ω , diode-protected. Batteries: 1 type D cell, 1.5 volts. 1 "B-C" battery, 15 volts (Eveready #411). Dimensions: 6 1/8" wide x 7 7/8" high x 3 1/2" deep (overall). Net weight: 3 lbs. 1 oz. Shipping weight: 4 lbs.

EUW-27 Sine-Square Generator

- Less than .25% sine wave distortion
- Less than .15 microsecond square wave rise time
- Sine and square wave output available simultaneously
- 20 Hz to 1 MHz in 5 bands
- Factory assembled and tested

EUW-27 . . . 14 lbs. (REA Express or Motor Frt. only) \$94.00

EUW-27 SPECIFICATIONS—Sine wave: Frequency range: 20 Hz to 1 MHz. Output volts (RMS): 0 to 10 volts, 0 to 1 volt, 0 to .1 volt, or 0 to .01 volt when working into a high impedance load. Source impedance: ($\pm 10\%$); 10 volt range, 0 to 3.5 k ohm; 1V, .1V, and .01V range, 600 ohm. Distortion: Less than .25% to 20 to 20,000 Hz. Frequency response: ± 1.5 db 20 Hz to 1 MHz. Square wave frequency range: 20 Hz to 1 MHz. Output volts: (P. to P.) $\pm 5\%$, 0 to 10 volt, 0 to 1 volt, 0 to .1 volt, into a high impedance load. Source impedance: ($\pm 10\%$); 10 volt range, 0 to 220 ohm; 1V and .1V ranges, 52 ohm. Rise time: less than .15 microsecond. General: Frequency accuracy; $\pm 5\%$. Power requirements: 105-125 V AC, 50/60 Hz, 55 watts. Dimensions: 13" W x 8 1/2" H x 7" D.

EUW-24 Vacuum Tube Voltmeter

- Single AC/Ohms/DC probe
- 7 AC, 7 DC, & 7 Ohms ranges
- Easy to read 4 1/2" meter
- 1% precision resistors
- Factory assembled and tested
- Front panel Servo Recorder connections

EUW-24, 6 lbs. \$62.00

EUW-24 SPECIFICATIONS—Meter scales: DC & AC (RMS): 0-1.5, 5, 15, 50, 150, 500, 1500 volts full scale. AC peak-to-peak: 0-4, 14, 40, 140, 400, 1400, 4000. Resistance: 10 ohm center scale x1, x10, x100, x1000, x10K, x100K, x1 meg. Measures 0.1 ohm to 1000 megohms with internal battery. Meter: 4 1/2" 200 ua movement. Multipliers: 1% precision type. Input resistance DC: 11 megohms (1 megohm in probe) on all ranges. Circuit: Balanced bridge (push-pull) using twin triode. Accuracy: DC $\pm 3\%$, AC $\pm 5\%$ of full scale. Frequency response: ± 1 db, 25 Hz to 1 MHz (600 ohm source). Battery: 1.5 volt, size "C" flashlight cell. Power requirements: 105-125 volt 50/60 Hz 10 watts. Dimensions: 6 1/2" H x 11 1/2" W x 5" D.

EUW-25 3" DC Oscilloscope

- Identical vertical & horizontal AC or DC coupled amplifiers
- DC to 400 kHz bandwidth
- Rise time, less than 1.5 microsecond
- Recurrent sweep generator, 5 Hz to 50 kHz in four ranges
- External capacity binding posts for slower sweep rates
- Factory assembled and tested
- Terminals for Z-axis modulation and direct connection to deflection plates

EUW-25, 18 lbs. (REA Express or Motor Frt. only) \$168.00

EUW-25 SPECIFICATIONS—(Vertical and horizontal channels identical): Bandwidth: DC to 400 kHz (3 db point). Sensitivity: 0.1 V (peak-to-peak) per 1/4" (uncalibrated). Attenuator: 3-position, compensated type. Gain control: Continuously variable. Input impedance: 3.6 megohms shunted by 35 mmf. Coupling: Either AC or DC, switch-selected. Relative phase shift between channels: Less than 5°. Sweep generator (recurrent type): Linear saw-toothed produced by multivibrator type generator covering 5 Hz to 50 kHz in four overlapping ranges. "External capacity" binding post for lower sweep rates. Sync. Provision: Either internal or external, switch-selected. Power requirements: 105-125 V 50-60 Hz AC at 100 watts max. Dimensions: 9 3/4" H x 9 3/4" W x 11 1/16" D.

EUW-15
\$75⁰⁰



EUW-16A
\$65⁰⁰



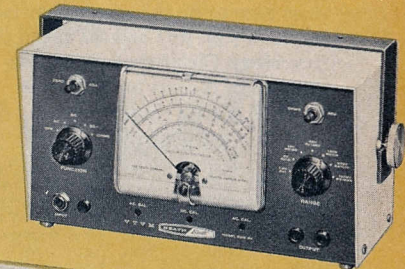
EUP-26
\$55⁰⁰



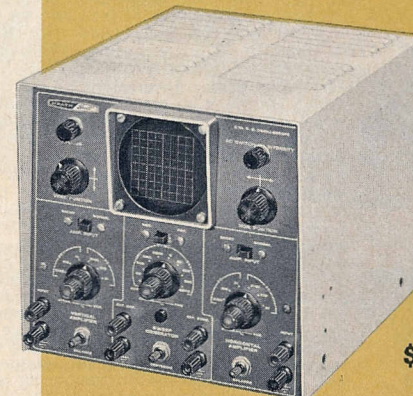
EUW-27
\$94⁰⁰



EUW-24
\$62⁰⁰



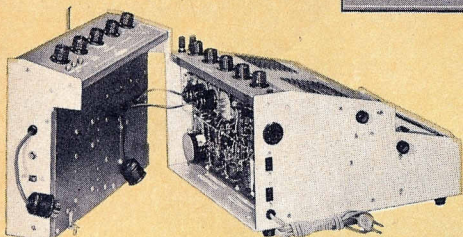
EUW-25
\$168⁰⁰



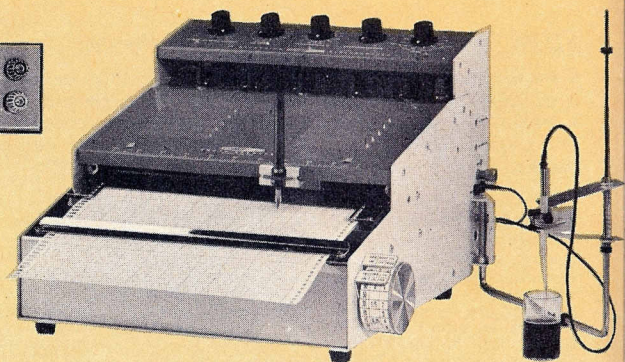


EDUCATIONAL

Factory Assembled Heath Malmstadt-Enke



pH Module Controls Complete, easy to operate. Regular controls on Chart Recorder are inactivated when pH module is connected.



EUW-301M EUW-301
\$369⁰⁰ **\$280⁰⁰**

EUW-301M Multi-Speed Recording pH Meter/Recording Electrometer

THE NEW HEATH EUW-301M MULTI-SPEED pH RECORDING ELECTROMETER HAS A SPLIT PERSONALITY! It can serve many useful and valuable roles in the chemistry laboratory. It can be used as a general purpose laboratory pH meter (in the "Measure" mode of operation), as a highly versatile multi-speed recording pH meter (in the "Record" mode of operation), and as a 50-1400 millivolt-full-scale electrometer (with the "Span" switch in the "Millivolt" position). On all scales and at all times the instrument operates as a null-point device with electrometer input. This feature enables pH and millivolt measurement from transducers with impedances as high as 10,000 megohms. Operated with suitable laboratory equipment, the Heath pH Recording Electrometer provides acid-base titration curves, reaction-rate curves, oxidation-reduction titration curves, stability curves, and data readout from a multitude of electro-chemical laboratory apparatus.

Compare The Features And Price With Any Other Instrument

- **MULTI pH RANGES!** Full scale pH spans of 1, 2, 5, 10 and 14. Any 1 pH unit, 2 pH units (etc.) over entire pH region of interest can be switched for full scale on 10" scale or recorder chart.
- **MULTI MV RANGES!** Full-scale millivolt spans of $\pm 50, 100, 200, 500, 1000$ and 1400. There are 14 calibrated 50 mv increments of zero suppression that can be switched in on all millivolt spans.
- **DIRECT READING!** pH is read directly from a 10" scale; expanded ranges are made direct reading by interchangeable scales (e.g. 6.000-8.000 pH, etc.).
- **21 RECORDING SPEEDS!** From 12"/min. to 1/2"/hr. The wide range of chart speeds allows Y axis rate of data readout to be matched to the rate of chemical reaction or process. Plus, chart rate may be continuously varied up to 12"/min. by auxiliary input. . . . This permits chart rate to be slaved to other laboratory apparatus. See pages 68 & 69 for details on this new 21 speed chart drive. EUW-301 Single-Speed pH Recording Electrometer features a standard chart rate of 2"/min. . . . extra chart motors are available.
- **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.
- **ACCEPTS GLASS AND CALOMEL ELECTRODES!** Beckman, Corning, Leeds & Northrup, Thomas, etc. without adapters.
- **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 OR MODULES!** Easily added because of the modular design and connector arrangement provided.

A Precision Instrument Through Modular Construction Techniques

DESIGNED BY DR. HOWARD V. MALMSTADT, PROFESSOR AT THE UNIVERSITY OF ILLINOIS, the EUW-301 is a truly unique instrument. It consists of a Heath Servo Chart Recorder coupled with a special pH module, EUA-20-11. It may be purchased as a complete unit, or those who already own an EUW-20A or EUW-20M Servo Chart Recorder may purchase the pH module separately for simple conversion (in a matter of minutes) to a pH Recording Electrometer. A special parts kit, EUA-301-1, is also available for converting the EUW-301 to a conventional Servo Chart Recorder.

PRECISION MODULAR ELECTRONICS PROVIDES EXPANDED pH RANGES AND FUNCTIONAL VERSATILITY. The expanded scales make it possible to measure the pH very precisely and accurately. Therefore, reliable measurements can be made for the determination of Kw, activity co-efficients, formation constants, and junction potentials. The unit can be used for Karl Fischer titrations, redox, precipitation and complexation titrations, nonaqueous titrations, the determination of sodium and potassium concentration with the new specific glass electrodes, and all potentiometric measurements. The pH Recording Electrometer can be easily adapted for control of automatic burettes and for pH Stat.

- EUW-301M, pH Recording Electrometer with Multi-Speed Chart Drive . . . 34 lbs. (REA Express or Motor Frt. Only) **\$369.00**
- EUW-301, pH Recording Electrometer with interchangeable chart drive motor (2"/min. provided) . . . 32 lbs. (REA Express or Motor Frt.) . . . **\$280.00**
- EUA-20-11, pH Module only, 12 lbs. (converts Heath EUW-20A or EUW-20M to pH Recording Electrometer) **\$125.00**
- EUA-301-1, Parts Kit, 2 lbs. (chopper kit converts EUW-301 or EUW-301M recorder portion to standard EUW-20A or EUW-20M Servo Chart Recorder) **\$20.00**

EUA-20-15 Reference Electrode \$20.00
 Beckman #39170 fiber junction calomel electrode. Lead length 30".

EUA-20-14 Glass Electrode \$25.50
 Beckman #41263 general purpose electrode covering a range of 0-11 pH and 5-80° C. Lead length 30".

EUA-20-16 Temperature Probe \$18.00
 Provides automatic temperature compensation of the EUW-301 Recording pH Electrometer. Simple plug-in connection.



EUA-20-17 Buffer Assortment \$8.00
 Buffer solutions by Mallinckrodt. Includes one pint each of pH 4.01, 7.00, and 10.00 buffers plus a 150 ML bottle of saturated KCl solution for refilling reference electrodes. In unbreakable plastic bottles.

EUA-20-23 Combination pH Electrode \$38.00
 Sargent S-30070-10 includes both pH electrode and reference electrode in single miniature glass envelope. 0-14 pH. 0-80° C.

EUA-20-12 pH Test Box \$25.00
 Provides quick pH meter check-out independent of cell or buffers through switch-selected output calibrated in pH units. 1% component accuracy. Checks linearity of pH meter from pH 0 to 14. Tests temperature compensation of pH meter. Checks for leakage currents in input circuitry of meter. Provides voltages for setting recording electrometers. Provides zero suppression voltages for use with potentiometric recording circuits. Test box simulates voltages from pH electrodes with 0 volts asymmetry potential.



Send for FREE Brochures!

A brochure describing the functions and applications of the EUW-301 pH Recording Electrometer in detail and a comprehensive data sheet on the Multi-Speed Chart Drive are yours FREE by simply dropping a note or card with your name and address to the Heath Company, Benton Harbor, Michigan 49022.

Complete Heath Malmstadt-Enke Polarography Laboratory EUW-402 . . . \$599.00

Includes EUA-19-2 Polarography Module, EUW-19B Operational Amplifier, EUW-20A Servo-Chart Recorder, & EUA-19-6 Dropping Mercury Electrode Apparatus

A COMPLETE LABORATORY FOR CONTROLLED POTENTIAL POLAROGRAPHY . . . developed by Dr. Chris Enke of Michigan State University. The Heath EUW-402 Polarography Laboratory provides exact qualitative and accurate quantitative electrochemical analysis for oxidizable or reducible ions in organic or inorganic solutions. It consists of a highly versatile Dropping Mercury Electrode Apparatus, a Polarography Module and Operational Amplifier for producing the required electronic functions, and a Servo-Chart Recorder for displaying the read-out data.

THESE ARE THE CAPABILITIES OF THE COMPLETE LABORATORY . . . EUW-402. • 3-electrode controlled potential polarography • 2-electrode polarography • Manual polarography • Controlled potential electrolysis • Controlled current electrolysis • Chronopotentiometry • Amperometric titrations • Other similar electro-chemical techniques requiring the Dropping Mercury Electrode, the highly versatile electronic instrumentation, and direct or strip-chart read-out.

THESE ARE THE CAPABILITIES OF THE LABORATORY WHEN ASSEMBLED WITH OTHER CONVENTIONAL EQUIPMENT (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, whatever amplifier is necessary, and oscilloscope) • Oxygen analysis for bio-medical purposes (with suitable oxygen electrodes) • Pulse-type polarography and other variations of the above techniques when the necessary accessory generators etc. are chosen.

ELECTRONIC INSTRUMENTATION (included in the combination of the Polarography Module (EUA-19-2) and the Operational Amplifier (EUW-19B)) . . . provides an electronic sweep potential in six 1%-calibrated rates from 0.05 to 2 volts/min. and the capability for measuring d.m.e. currents from 0.5 to 1000 microamperes full scale. Five degrees of damping can be applied to the readout waveform. The 0.5%-calibrated initial potential is continuously variable— ± 3 volts. And full capabilities are included for adjustable electrode current suppression and adjustable charging current-suppression. All equipment supplied factory assembled.

EUA-19-6 SPECIFICATIONS—Includes all electrodes for 3-electrode controlled potential polarography dropping mercury electrode (less Hg⁰), calomel reference electrode, platinum counter electrode • Easy to set up • Simple to operate • Teflon® stop cock on mercury supply • Adjustable mercury height • Mercury head scale adjusts to read height directly in mm. • Spring loaded cell holder for quick change of samples—usable with a wide variety of sample containers • Complete facilities for nitrogen purging—includes micrometer nitrogen flow valve • High mechanical stability • Built-in plumb for rapid leveling • Built from heavy gauge aluminum with enamel finish to resist corrosion • Upper section (less base) can be removed and attached to any standard laboratory rack • Includes all cables and connectors (preassembled) for operation with the Heath Malmstadt/Enke EUW-401 Polarography System.

EUA-19-2 SPECIFICATIONS* — Potential control: Max. output voltage: ± 50 v.; current: ± 1 ma. Stability: ± 10 mv after warm-up. Noise: 1 mv p-p or less at electrode potential output jack. Input resistance: approx. 100M ohms at reference electrode input. Electrode potential meter range: ± 3 v. Electrode potential output resistance: 22 ohms. **Initial potential source:** Range: ± 3 v. Accuracy: 0.5%. Repeatability of adjustments: ± 5 mv. **External control voltage inputs:** Input impedance: 100K. Frequency response: down 3 db at 10 KHz, 30 microsecond rise time. **Sweep generator:** Calibrated sweep rates: 0.05, 0.10, 0.20, 0.50, 1.0, 2.0 volts/min., plus or minus. Accuracy: $\pm 1\%$, individually calibratable to 0.1%. Linearity: better than 1% for 1 volt sweep. Range: ± 5 v. 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: $\pm 1\%$ at output jacks, $\pm 2\%$ on meter. Damping time constants: off, 0.1, 0.35, 0.7, 1.3, 2.5 sec. on 100 mv output only. Current suppression: up to ± 90 microamperes in 2 ranges. Charging current suppression: up to 1 microampere/ volt of sweep. *Plugged in front of Heath EUW-19A Operational Amplifier System and using 3-electrode cell and dropping mercury electrode.



Send For FREE BROCHURES

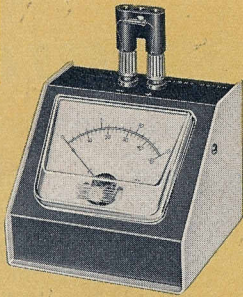
Discusses polarography, gives specifications on the electronics for the Heath Polarography System, and suggests additional techniques with which the system can be used. Also describes the Dropping Mercury Electrode Apparatus (D.M.E.) which completes the Heath Polarography Laboratory. Write to Heath Company, Benton Harbor, Michigan 49022

- EUA-19-2, Polarography Module . . . 8 lbs. \$185.00
 - EUW-19B, Operational Amplifier . . . 22 lbs. \$135.00
 - EUW-20A, Servo-Chart Recorder . . . 20 lbs. \$199.00
 - EUW-401, Electronic Polarography Instrumentation (EUA-19-2, EUW-19B, EUW-20A) . . . 53 lbs. \$480.00
 - EUA-19-6, Dropping Mercury Electrode Apparatus . . . 20 lbs. . . . \$149.00
 - EUW-402, Complete Polarography Laboratory (EUW-401 and EUA-19-6) . . . 73 lbs. \$599.00
- All Express or Motor Freight Only, Except EUA-19-2.



Heath Malmstadt-Enke Lab Instruments

EDUCATIONAL



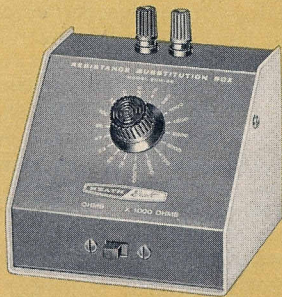
EUW-18
\$22⁰⁰

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 (milliampere) full scale. Accuracy: $\pm 2\%$ of full scale. Meter resistance: 50 ohm. Shunt resistors: 1.02 ohm $\pm 1\%$ for 50 ma range; 2 ft. resistance wire at 9.99 ohm/ft. for 15 ma and 5 ma ranges; 100 ohm $\pm 1\%$ for 1.5 ma range.



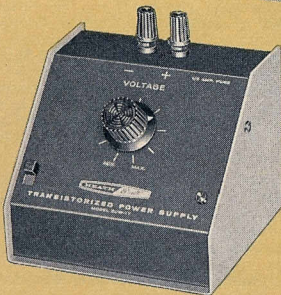
EUW-28
\$16⁰⁰

EUW-28 Resistance Substitution Box

• Selects each of 36 resistors—15 ohms to 10 megohms • Resistors E.I.A. standard 10%—1 watt • Two-position switch for high and low range • Terminals space for $\frac{3}{4}$ " dual banana plug

EUW-28, 2 lbs. \$16.00

EUW-28 SPECIFICATIONS—Resistance values: 15, 22, 33, 47, 68, & 100 ohms x1, x10, x100, x1K, x10K, & x100K with 15 to 10K ohms in low range and 15K to 10 megohms in high range.



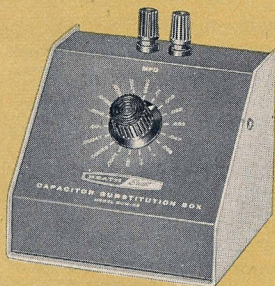
EUW-17
\$20⁰⁰

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
\$14⁰⁰

EUW-29 Capacitance Substitution Box

• Selects each of 18 capacitors 0.0001 mfd to 0.22 mfd • Matches dual banana plug with $\frac{3}{4}$ " spacing

SELECTS STANDARD CAPACITOR VALUES . . . with voltage ratings of 500 volts for the three smallest capacitors, 400 volts for the two largest, and 600 volts for all remaining capacitors.

EUW-29, 2 lbs. \$14.00

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

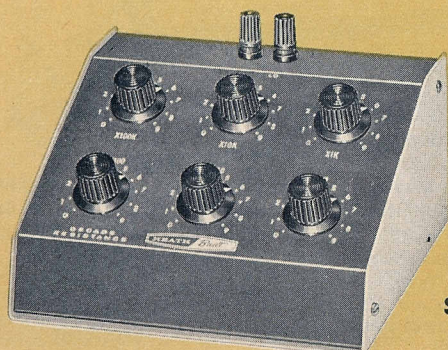
EUA-14-1, Additional Utility Amplifier Parts, 2 lbs. \$5.00

EUW-30 Six-Decade Resistance Box

• Selects values from 1 ohm to 999,999 ohms in 1 ohm increments • $\frac{1}{2}$ of 1% accuracy • Make before break switches

PROVIDES EXCELLENT RESISTANCE ARM FOR DC OR AC BRIDGES. Precision resistors assure accuracy to 0.5%. $\frac{3}{4}$ " terminal spacing for dual banana plugs. $7\frac{1}{8}$ " W x 5" H x 6 $\frac{5}{8}$ " D.

EUW-30, 4 lbs. \$34.00

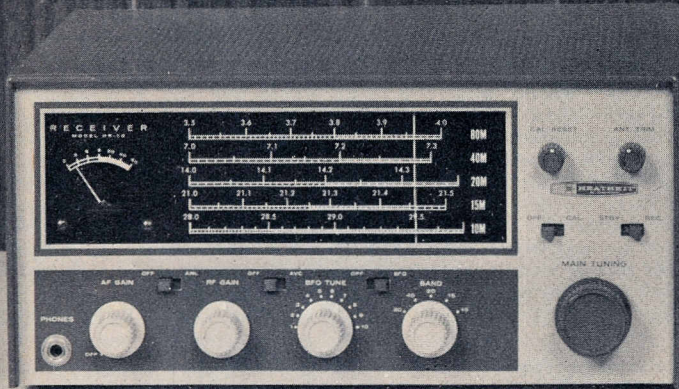


EUW-30
\$34⁰⁰

Over 400 components



EU-13A
\$177⁰⁰



Explore The Exciting World Of Amateur Radio With The Heathkit HR-10 . . . Only \$75

• An unequaled value for the beginning ham • High stability and excellent tuning accuracy is achieved through "amateur bands only" coverage • Tunes SSB, AM, & CW on 80-10 meter bands • High quality lattice-type crystal filter for optimum communications selectivity • Optional 100 kc crystal calibrator plugs-in inside of receiver enclosure • 7-tube superheterodyne circuit with RF stage for extra sensitivity • Prebuilt, pre-aligned tuning unit for fast, simple assembly

WHO SAID HAM RADIO HAS TO BE EXPENSIVE? . . . here's the way to start your amateur station on a budget beginners can afford. Build the HR-10! . . . You'll enjoy the easy step-by-step construction, the handsome completed receiver, and the pleasure of operating this excellent performer. Here's a stable, selective receiver. Each band is individually calibrated, and an illuminated slide-rule dial provides accurate frequency settings. A full complement of front-panel controls assures that you will not outgrow your HR-10 . . . tunes AM, CW, and single sideband.

GET THE FEATURES YOU FIND IN "EXPENSIVE" RECEIVERS! The HR-10 has a built-in "S" meter, provisions for a plug-in 100 kc crystal calibrator, separate RF and AF gain controls, and BFO tuning; plus the features you need for operating a complete amateur station . . . a crystal calibrator switch, standby-receive, AVC on/off, and an automatic noise limiter. Send for your HR-10 today!

- Kit HR-10, 20 lbs., no money dn., \$8 mo. \$75.00
- Kit HRA-10-1, Plug-in 100 kc crystal calibrator, 1 lb. \$8.95
- Kit HS-24, Speaker, 4 lbs. \$7.00

Export model available for 115/230 VAC, 50-60 Hz; write for prices.
HR-10 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: 117 volts AC, 50/60 Hz, 50 watts. Dimensions: 13 3/4" W x 11 1/2" D x 6 1/2" H.

Novice Or Old-Timer . . . You'll Enjoy The DX-60A Phone & CW Transmitter . . . Just \$79⁹⁵

• 90 watts phone or CW—80 through 10 meters • Neutralized 6146 final amplifier • Built-in low pass filter • Grid-block keying—keys beautifully with the HD-10 Electronic Keyer • Easy access to crystal sockets • Go VFO with the HG-10 • May be run at reduced power for novice operation • Mate to the HR-10
NO OTHER TRANSMITTER IN THIS PRICE RANGE WILL OFFER YOU MORE! If you're a novice, the DX-60A is right for you. Operate it at the required 75-watt maximum (crystal control) for novice class CW . . . and later when you get your general class phone license, go to VFO control and use the DX-60A's full 90 watts of power. (See the HG-10 VFO and HD-10 Electronic Keyer on page 76.)
GET ON THE AIR WITH A QUALITY PERFORMER. The DX-60A is the style and performance mate of the HR-10. Its quality, well-rated components, thoughtful circuit layout, clean rugged construction, and attractive styling make it the ideal low power transmitter. Building this versatile performer is fast and easy . . . step-by-step instructions and a precut cabled wiring harness make it a satisfying project.

COMPARE—SEE WHY YOU GET MORE FOR YOUR MONEY WITH THE DX-60A! Check these advanced features . . . a low-pass filter to suppress harmonic interference . . . a neutralized final amplifier for high stability . . . excellent grid block keying . . . switch selection of four crystal positions or external VFO for full coverage of amateur bands . . . meter that shows final grid or plate current . . . plus single-knob bandswitching and pi-network for complete operating convenience. Less crystals. Compare! . . . you'll choose the DX-60A.

Kit DX-60A, 24 lbs. . . (less crystals) . . . no money dn., \$8 mo. . . . \$79.95
 Export model available for 115/230 VAC, 50-60 Hz; write for prices.

DX-60A 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: 105-125 V., 50-60 Hz, 225 watts. Dimensions: 13 3/4" W x 11 1/2" D x 6 1/2" H

Low-Cost 6 & 2 Meter VHF Transceivers . . . Go VHF For Less Than \$50 With The "Benton Harbor Lunch Boxes"

• 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

A COMPLETE TRANSCIEVER . . . LUNCH BOX SIZE . . . features crystal controlled transmitter with straight-through final. Crystals (not supplied) are in the 8 MHz range. Receiver is super-regenerative with RF stage. 1 microvolt sensitivity! The built-in 120 VAC power supply, press-to-talk switch on front panel and ceramic microphone included make these units ready to go on the air with your antenna. Power cables for mobile and A.C. operation are included.

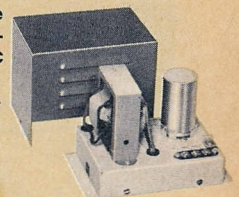
- Kit HW-29A (6 meter), 9 lbs., no money dn., \$5 mo. . . . \$44.95
- Kit HW-30 (2 meter), 9 lbs., no money dn., \$5 mo. . . . \$44.95
- Kit GP-11, Mobile Power Supply, 6 lbs. \$16.88

Mobile Power Supply For "Benton Harbor Lunch Boxes"

• Ideal for use with the "Sixer" and "Twoer" • Operates from 6 or 12 volt DC source • Silicon diode rectifiers • Small, compact—easy to install • Provides remote on /off switching • Heathkit green color

Kit GP-11, 6 lbs. . . . \$16.88

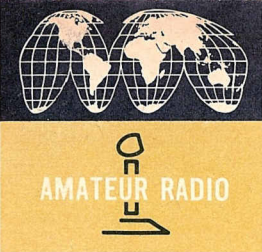
GP-11 SPECIFICATIONS—Power requirements: 6 volt version, 6.3 VDC @ 6.5 amperes or 12.6 VDC @ 3 amperes for rated output. Power output: 250 VDC @ 100 mg. ICAS. Power rectifier: Two silicon diodes in voltage doubler circuit. Vibrator: Mallory type 1610 or equivalent. Vibrator frequency: Approximately 115 Hz. Overall dimensions: 4 3/8" H x 6 1/2" W x 4 1/8" D.



GP-11
\$16⁸⁸



HW-29A
\$44⁹⁵



The World's Largest Selection

Heathkit Solid-State Electronic Keyer



HD-10
\$39⁹⁵

• All solid-state circuitry • Speed range—15 to 60 words per min. Slow-speed option—10 to 20 wpm (furnished) • Built-in sidetone for monitoring transmissions or off-the-air practice • Solid-state switching—no relays to stick or chatter • Built-in paddle—"feel" is adjustable to your fist during assembly • Adaptable to either right or left handed operators • Convertible to semi-automatic operation • External paddles or keys may be connected for multi-operator use • Variable dot-space ratio • Self-completing dashes • Sealed switches on paddle—no exposed contacts to require cleaning or adjustment • "Hold" switch for transmitter tuning • Built-in transformer-operated power supply isolates keyer from the power line • Fused for protection • For grid-block keying transmitters only; -105 v. @ 35 ma max.

SLOW SPEEDS FOR THE NOVICE OR RED-HOT FOR THE EXPERIENCED BRASS POUNDER . . . that's the Heathkit all solid-state electronic keyer. Solid-state electronic switching means no relays to clatter . . . no contact bounce to punch holes in characters. Novices! . . . use the "Keyer" with the low-cost DX-60A Transmitter. The slow-speed option and built-in sidetone of the "Keyer" let you build up a good fist. CW men! . . . the HD-10 has plenty of natural weight to remain well "planted" on your desk even during the hottest contest hours. For grid-block keying transmitters only . . . note max. current and voltage rating.

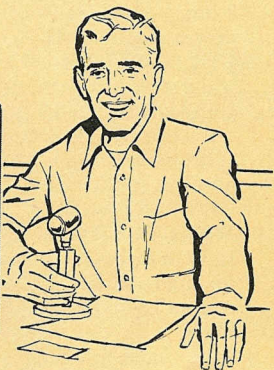
Kit HD-10, 6 lbs., no money dn., \$5 mo. \$39.95

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 2½ V. tap; 14 milliamperes. **Dimensions:** 3¼" W x 4¼" H x 10½" D.

Heathkit Amateur Band VFO



HG-10
\$34⁹⁵



WORK VFO ON 80 THROUGH 2 METERS! Calibrated for "80 through 2," the Heathkit HG-10 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-10 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-10, 12 lbs. . . No money down, \$5 mo. \$34.95

HG-10 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-60A.) **Dimensions:** 9½" W x 6½" H x 9½" D.

Radio Amateur's Handbook

LATEST EDITION OF THIS MOST POPULAR REFERENCE BOOK! Covers all phases of theory, construction, and operating principles. Includes "plain-talk" sections on basic electronics; receivers and transmitters for HF, VHF, UHF; gear for AM, CW, and SSB; antennas; and workshop practices; plus, comprehensive tube and transistor data.

HDP-293, 3 lbs. \$4.00

Here's The Way To Practice Radio-Telegraph Code

ASSEMBLE TWO CO-1's (THE HEATHKIT CODE PRACTICE OSCILLATOR) . . . then practice with a friend—conversation in code improves both sending and receiving ability, and helps develop clear, distinct, properly formed characters. The CO-1 features an authentic CW tone, a blinker light for practice in reading Navy-type blinker communications, and built-in battery power. Uses 2 "C" cell batteries (not included). Complete with standard telegraph key.

Kit CO-1, 2 lbs. \$7.95

Complete Amateur Radio License Course

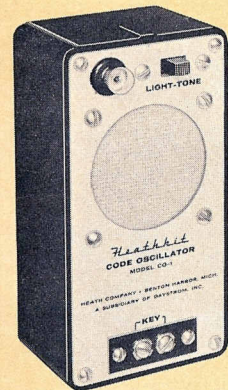
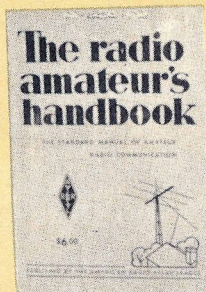
OBTAIN YOUR FCC HAM LICENSE FAST! . . . Course includes 4 American Radio Relay League handbooks: "How To Become A Radio Amateur"; "Radio Amateur's License Manual"; "Learning The Radio-Telegraph Code"; and "Operating An Amateur Radio Station"; plus a code oscillator kit with key and 3 records that teach code by the revolutionary "word-method." You'll enjoy learning about the space-age world of short-wave communications, electronics, and the fascination of amateur radio.

HDP-22, Complete Amateur Radio Starter Group, 6 lbs., Save \$3.00 \$15.95

HDP-32, Code Records Only, 2 lbs. \$9.50

HDP-42, ARRL Books Only (4), 2 lbs. \$2.00

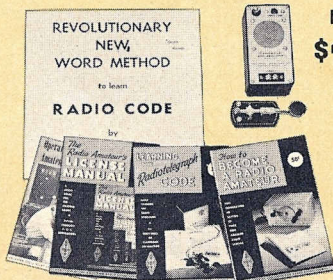
Kit CO-1, Oscillator plus Key only (See description above.) 2 lbs. \$7.95



CO-1
\$7⁹⁵

HDP-293
\$4⁰⁰

HDP-22
\$15⁹⁵



Of Amateur Radio Equipment



Heathkit SWR Meter . . . Checks Antenna Efficiency

- Shows antenna/transmission line match—indicating forward & reflected power & SWR • Covers 160-6 meters • Handles peak power well over 1, kw • Matches 50 or 75 ohm lines with wiring options • Styled to match SB-Series equipment • Easy to assemble

HEATHKIT REFLECTED POWER METER (SWR METER) ENABLES YOU TO ADJUST YOUR ANTENNAS FOR MAXIMUM EFFICIENCY. HM-15 provides direct reading of percentage of forward and reflected power, and voltage-standing-wave-ratio (VSWR). Ideal for matching impedances between exciters and final amplifiers, or for designing multi-element antennas. VSWR can be read from 1:1 to over 3:1. Sensitivity control adjusts readings to match power levels of various transmitters.

Kit HM-15, 2 lbs. \$14.95

HM-15 SPECIFICATIONS—Operation: Indicates percentage of forward and reflected power, and voltage standing wave ratio (SWR). **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:** 9 1/4" L x 3 3/8" W x 2 3/8" H.



HM-15
\$14⁹⁵

Heathkit Phone Patch . . . Matches SB-Series Styling

- Features individual gain controls for receiver-to-line & line-to-transmitter audio level • VU meter to monitor audio levels • Operates with VOX or PTT • Convenient one-switch operation

JUST A FLIP-OF-A-SWITCH TO "PATCH IN" THE TELEPHONE . . . ideal for heavy SSB phone patch traffic. The HD-15 transfers audio to 600 ohm telephone lines with negligible hum or crosstalk. Operates with virtually all transmitters and receivers. Styled to match the Heathkit SB series equipment. Use with 3 to 16 ohm speakers and Hi-Z or 600 ohm transmitter phone patch inputs. The HD-15 Hybrid Phone Patch is a fun kit to build! . . . assembles in just one evening. It's the perfect complement to the well outfitted amateur station.

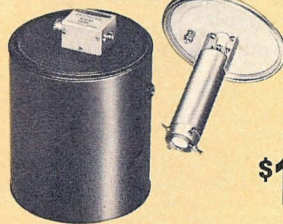
Kit HD-15, 3 lbs., no money dn., \$5 mo. \$24.95

HD-15 SPECIFICATIONS—Circuit: Telephone hybrid circuit. Allows voice control or manual operation. Single switch places unit in full operation. **Telephone Line Input Impedance:** Approximately 600 ohm. **Meter:** Standard VU meter for constant output monitoring and null depth indication. **Null Depth:** At least 30 db isolation between transmit and receive circuits. **Receiver Impedance:** Effective match from 3 to 16 ohm. **Transmitter Impedance:** 600 ohm or high impedance output. **Cabinet Size:** 9 1/4" L x 3 3/8" W x 2 3/8" H.



HD-15
\$24⁹⁵

A
HN-31
\$9⁹⁵



B
HD-20
\$14⁹⁵



C
PM-2
\$12⁹⁵



D
HDP-21A
\$29⁴⁰



E
GH-12
\$6⁹⁵



A "Cantenna" The Famous Heathkit Transmitter Dummy Load

MAKE TRANSMITTER CHECKS WITHOUT CREATING HARMFUL INTERFERENCE. The Heathkit "Cantenna" provides a 50 ohm non-inductive load for testing up to 1 kw transmitters. Standing Wave Ratio (SWR) is less than 1.5:1 for frequencies from 160 to 2 meters. Connects to the transmitter through a coax fitting . . . phono jack is provided for relative power checks with any standard VOM or VTVM. Oil coolant capacity 1 gallon (oil not included).

Kit HN-31, 3 lbs. \$9.95

B 100 kHz Crystal Calibrator

PRODUCES CALIBRATING SIGNALS EVERY 100 kHz . . . from 100 kHz to over 54 MHz. 9-volt battery (not included) provides built-in power to transistorized 100 kHz oscillator with

0.005% tolerance. Trimmer tunes output to exact frequency (against WWV or another standard).

Kit HD-20, 1 lb. \$14.95

C Heathkit PM-2 Handy RF Power Meter

SHOWS RELATIVE POWER OUTPUT OF TRANSMITTERS . . . 100 kHz to 250 MHz. Use it to make a quick check on ham, marine, commercial, or CB transmitters. 0.3 volts RMS at meter antenna gives full scale reading. A strong magnet in the base holds the PM-2 to any solid ferrous surface. No power connections or battery required.

Kit PM-2, 2 lbs. \$12.95

D Special SSB "Ham" Microphone With Desk-Stand

NEW, MODERN STYLING TO MATCH THE PACE SET BY THE SB-SERIES EQUIPMENT

. . . this high impedance dynamic mike features special response (300 to 3,000 Hz) to favor voice frequencies 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

E Push-To-Talk Mobile Microphone

HERE'S A LONGTIME FAVORITE MOBILE MIKE. Featuring a special "shaped" response for voice frequencies, the GH-12's ceramic element is well suited to the rugged work-out given to mobile equipment . . . it is virtually unaffected by the temperature extremes that sometimes occur in closed cars. Complete with cable, less connector.

Model GH-12, 2 lbs. \$6.95

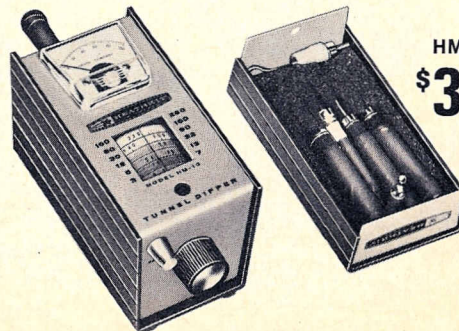
Heathkit Solid-State "Tunnel Dipper"

- Up-to-date, solid-state equivalent to the grid-dip meter • Tunnel diode oscillator—no tubes • Covers frequency range of 3 to 260 MHz • Gear-drive tuning • Durable epoxy-coated plug-in coils • Coils color-matched to dial scales • Built-in coil storage

A MODERN SOLID-STATE INSTRUMENT . . . MAKES TUBE-TYPE GRID-DIP METERS OBSOLETE. The tunnel diode oscillator provides a dependable signal throughout the entire tuning range . . . indicates resonance with the circuit under test by a "dip" in the meter reading. Doubles as a sensitive wavemeter. (Less battery.)

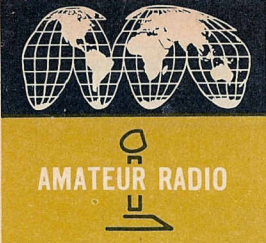
Kit HM-10A, 3 lbs. . No money down, \$5 mo. \$34.95

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:** 5 7/8" L x 2 1/8" W x 4 3/8" H (cover included).



HM-10A
\$34⁹⁵

Use Heath's Technical Consultant Service—Just Drop Them A Line On Any Kit Subject



Look To Heath For Unsurpassed

Heathkit Single-Bander Transceivers . . . Choose 80, 40, or 20 Meter Models

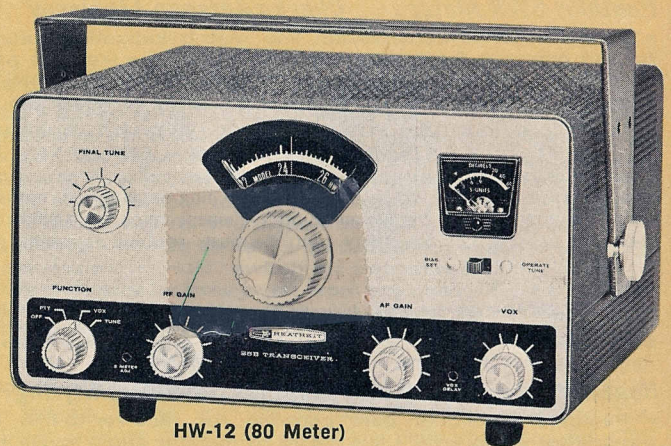
• "HW" units are complete one-band transceivers for 80, 40, or 20 meter SSB operation • HW-12 & HW-22 operate LSB on 80 & 40 meters, respectively, HW-32 operates USB on 20 meters • 200 watts P.E.P. input—two 6GE5 RF amplifiers • Excellent exciters for operation on the band of your choice with the KW Kompact as a high-power final • Crystal filter type SSB generation • ALC, AVC, and S-meter • Built-in VOX & push-to-talk circuitry • Stable low frequency VFO • 2 kHz dial divisions—6" bandspread—planetary tuning

THE SSB TRANSCEIVER THAT STARTED A NEW TREND! The number of Heathkit single-banders you hear on the air is dramatic proof that these rigs provide the most for your money on your favorite band. Outfit your fixed station with the HP-23 AC supply, or go mobile with the HP-13 DC supply.

COMPACT, LIGHTWEIGHT, UNCLUTTERED STYLING . . . make these units ideal for portable and mobile operation, or for that "corner of the living room" station. Gimbal mounting bracket permits easy installation and removal from auto for double duty in mobile or fixed-station modes of operation. The "Single-Bander" of your choice is a perfect driver for the KW Kompact linear amplifier, or provides effective "barefoot" operation.

FEATURES TO DELIGHT ANY AMATEUR! Features include a deluxe 14-tube heterodyne circuit . . . 200 watts peak-envelope-power input for long-range communications . . . a highly stable temperature-compensated 1.5-1.8 MHz VFO . . . crystal-lattice filter for SSB generation . . . automatic level control for preventing flat-topping . . . built-in PTT and VOX circuits . . . provision for use with a linear amplifier. And what's more! . . . 1 uv receiver sensitivity, 2.7 kHz selectivity and slow AVC action assure excellent SSB reception. Provision is made for simple plug-in connection of a 100 kHz crystal calibrator for accurate band-edge markings.

DESIGNED FOR FAST, EASY ASSEMBLY. Average assembly time is only 15 hours. Over 90% of the components mount on a heavy-duty circuit board and the remainder of the circuit is connected with a pre-cut, cabled wiring harness. Alignment is easy with all critical stages pre-tuned! The only other equipment you need for immediate on-the-air operation is a PTT microphone, antenna, speaker and a power supply (see below). Choose one of these fine-performing units now for versatile all-around "Ham" communications at tremendous savings!



HW-12 (80 Meter)

\$119⁹⁵

- Kit HW-12: 80-meter, 15 lbs. . . No money down, \$11 mo. . . . \$119.95
- Kit HW-22: 40-meter, 15 lbs. . . No money down, \$11 mo. . . . \$119.95
- Kit HW-32: 20-meter, 15 lbs. . . No money down, \$11 mo. . . . \$119.95
- GH-12, Push-to-talk and VOX microphone. . . 2 lbs. \$6.95
- Kit HRA-10-1, Plug-in 100 kHz crystal calibrator. . . 1 lb. \$8.95
- Kit HP-13, DC Power Supply (Mobile), 7 lbs. . . no money dn., \$6 mo. \$59.95
- Kit HP-23, AC Power Supply (Fixed station), 19 lbs. . . no money dn., \$5 mo. \$39.95
- Kit HS-24, Mobile Speaker, 4 lbs. \$7.00

SPECIFICATIONS—RF input: 200 watts PEP. **Sideband generation:** Crystal lattice band-pass filter method. **Stability:** 200 Hz per hour after warm-up. **Carrier & unwanted sideband suppression:** 45 db. **Frequency coverage:** HW-12, 3.8—4.0 MHz; HW-22, 7.2—7.3 MHz; HW-32, 14.2—14.35 MHz. **Receiver sensitivity:** 1 μ v for 15 db (S+N)/N ratio. **Receiver selectivity:** 2.7 kHz @ 6 db, 6.0 kHz @ 50 db. **Output:** 50 ohm fixed (unbalanced). **Operation:** HW-12 & HW-22, LSB; HW-32, USB. **Audio output:** 1 watt @ 8 ohms. **Mike input:** Hi-Z. **Panel controls:** Frequency, final tune, function [OFF-PTT-VOX-TUNE], RF gain, AF gain [pull for crystal calibrator], VOX gain, meter. **Front panel screw-driver adjust for S-meter and VOX delay.** **Rear panel controls:** Mike gain, tune level, final bias. **Tube complement:** Fourteen tube heterodyne circuit; (3) 6EAB's mic. amp., VOX relay amp., IF amp., RF amp., Recvr. mixer; (5) 6AU6's, VFO, VOX amp., IF amps., Xmtr. mixer; (1) 6BE6, VFO isolator (HW-12), Het. osc. and mixer (HW-22 & HW-32); (1) 12BY7 Driver; (1) 12AT7 Xtal. osc., product det.; (1) 6EB8 Audio amp. and output; (2) 6GE5 RF output. **Power requirements:** 800 VDC @ 250 MA peak, 250 VDC @ 100 MA, —130 VDC @ 5 MA, 12 VAC or VDC @ 3.75 amperes. **Cabinet dimensions:** 6 1/4" H x 12 1/2" W x 10" D.

Heathkit Solid-State Mobile Power Supply For SSB Rigs

ESPECIALLY DESIGNED FOR MOBILE OPERATION OF HEATHKIT SSB TRANSCEIVERS . . . "Single-Banders," the SB-100, and SB-110. Full provisions are included for "remote" mobile operation . . . so that the power supply can be installed in the engine compartment or elsewhere. Primary and filament lines are circuit breaker protected. Husky ratings.

Kit HP-13 DC Power Supply. . . 7 lbs. No money down, \$6 mo. \$59.95

HP-13 SPECIFICATIONS—Input voltage: 12 to 14.5 volts DC (for negative ground only). **Input current:** 25 amperes maximum with full load. **High voltage output:** 800 volts DC, no load; 750 volts DC @ 250 ma. AC ripple: Less than 1% @ 250 ma. Duty cycle: Continuous up to 150 ma; 50% up to 300 ma. **Low voltage output:** (high tap) 310 volts DC, no load; 300 volts DC @ 150 ma, (low tap) 265 volts DC, no load; 250 volts DC @ 150 ma. AC ripple: Less than .05% @ 150 ma. Continuous duty cycle to 175 ma. **Adjustable bias voltage:** —40 to —130 volts DC @ 20 ma max. Duty cycle: Continuous. **Switching frequency:** 1500 Hz (approx.). **Ambient temperature:** —10° to 122° F. **Dimensions:** 7 3/4" W x 7-5/16" L x 2 3/8" D. All voltages referenced at 13 VDC input.

Heathkit Fixed-Station Power Supply For SSB Transceivers

PROVIDES HIGH VOLTAGE, BIAS, AND FILAMENT POWER FOR FIXED-STATION INSTALLATIONS OF HEATHKIT SSB TRANSCEIVERS . . . "Single-Banders," the SB-100, and SSB-110. The HP-23 features excellent dynamic regulation for clean SSB signals. It can be installed inside the SB-600 speaker enclosure. The useful range of output voltages from the HP-23 also makes it a versatile general purpose power supply . . . compare its specifications.

Kit HP-23 AC Power Supply. . . 19 lbs. . . No money down, \$5 mo. \$39.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

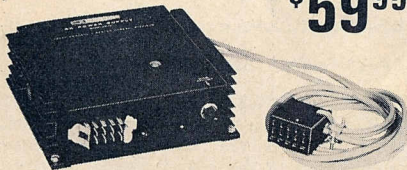
HP-23 SPECIFICATIONS—Power requirements: 120 volts AC, 50-60 Hz, 350 watts maximum. **High voltage output:** 820 volts DC no load; 700 volts DC @ 250 ma. \pm 10%. AC ripple: Less than 1% @ 250 ma. Duty cycle: 150 ma continuous, to 300 ma @ 50%. **Low voltage output:** (High tap) 350 volts DC, no load; 300 volts DC @ 150 ma \pm 10%, (Low tap) 275 volts DC, no load; 250 volts DC @ 100 ma \pm 10%. Less than .05% AC ripple @ 150 ma, continuous duty to 175 ma. **Fixed bias:** —130 volts DC, \pm 10%, no load; —100 volts DC @ 20 ma. **Adjustable bias:** —40 to —80 volts DC @ 1 ma maximum. Less than .5% AC ripple. **Filament voltage:** 6.3 V AC @ 11 amps; 12.6 V AC @ 5.5 amps. **Dimensions:** 9" L x 4 3/4" W x 6 3/4" H.

Heathkit Mobile Speaker

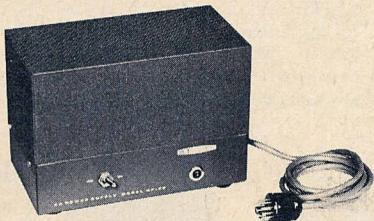
Features rugged steel cabinet with gimbal mounting • 8 ohm speaker • Dimensions—6 7/8" W x 4 3/4" H x 2 1/2" D.

Kit HS-24, 4 lbs. \$7.00

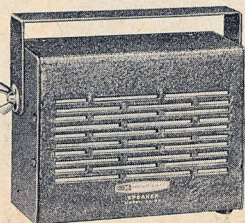
HP-13
\$59⁹⁵

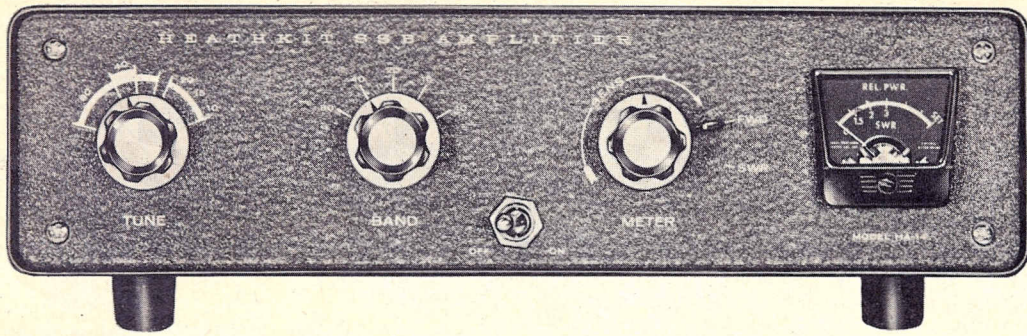


HP-23
\$39⁹⁵



HS-24
\$7⁰⁰





HA-14
\$99⁹⁵

Heathkit "KW Kompact" . . . World's Smallest Kilowatt SSB Linear Amplifier

- 1000 watts P.E.P. • Tunes 80 through 10 meters • ALC output to exciter • Built-in antenna change-over relay • Built-in SWR meter aids antenna adjustments on the road & monitors for maximum efficiency • Pretuned broad-band input circuit requires no tuning • Engineered with a pair of rugged tubes ideally suited to mobile operation (527-B's or T-160-L's) • Full provision for control of "remotely" located AC or DC power supply

A NEW DIMENSION IN AMATEUR RADIO . . . 1000 WATTS x 1 FOOT WIDE x \$99.95 . . . the Heathkit KW Kompact SSB linear amplifier sets new standards for size and price. It can be installed under the dash of nearly every model of car with plenty of room to spare—room enough in most cars to allow it to be stacked with your Transceiver, providing a complete under-dash mobile kilowatt station. Or picture the KW Kompact on your desk top . . . its ultramodern low profile and handsome styling merits your pride in owning the world's smallest kw SSB linear.

THE PERFECT FINAL FOR THAT SINGLE-BANDER OR SB-100. The KW Kompact gives the value you expect from Heathkit Amateur Radio Equipment . . . matches the high performance standards designed into the Single-Banders and SB-Series equipment. And the KW Kompact's full line of features makes it as versatile as linears many times its size. A panel mounted SWR meter enables on-the-spot antenna checks and adjustments, allowing continuous peak performance over the entire range of tuning. The antenna change-over relay is built-in, and provides "barefoot" operation when the linear is off. Input circuitry is pre-tuned.

EVER CONSIDERED A KILOWATT IN A CAR? . . . IT MEANS REAL SOCK FOR MOBILE AND EMERGENCY COMMUNICATIONS. And to

give you that sock, Heath chose a pair of husky 572-B's or T-160-L's (the two types are equivalent) operating in parallel to provide a clean signal with third order products 30 db down or better at the full 1000 watts PEP input. The matching power supplies (HP-14 & HP-24 below) are completely remote controlled and circuit breaker protected.

- Kit HA-14, 10 lbs. . . No money down, \$10 mo. \$99.95
- Kit HP-14, DC Power Supply, 10 lbs., no money dn., \$9 mo. \$89.95
- Kit HP-24, AC Power Supply, 22 lbs., no money dn., \$5 mo. \$49.95

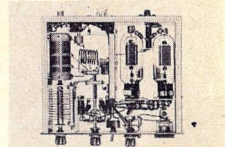
HA-14 SPECIFICATIONS—Band coverage: 80, 40, 20, 15, and 10 meters. Maximum power input: SSB, 1000 watts P.E.P. Driving power required: 100 watts P.E.P. Duty cycle: 50% (SSB voice modulation). Third order distortion: —30 db or better at 1000 watts P.E.P. Output impedance: Fixed 52 ohms unbalanced. SWR not to exceed 2:1. Input impedance: 52 ohms unbalanced; broad-band pretuned input circuit. Meter functions: 0-6 relative power & 1:1 to 3:1 SWR. Front panel controls: Tuning, band switch, relative power sensitivity control, meter switch (FWD & SWR), power switch (off, on). Tube complement: Two 572-B (or two T160-L) in parallel. Power requirements: 2000 VDC at 500 ma SSB peak, —110 VDC at 60 ma, and 12.6 V. AC or DC at 4 amperes. Recommended for 12 v. neg. ground, alternator equipped cars only. Cabinet Size: 12¹/₁₆" W x 3³/₁₆" H x 10" D.



Picture a "KW Kompact" on your operating desk. Handsome design, small size. Ideal for portable operation, too!

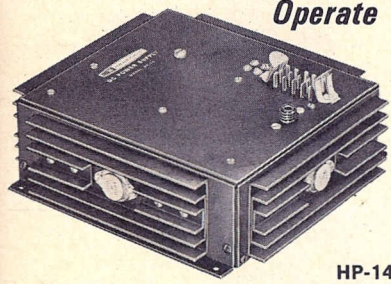


A kilowatt in a car? The "KW Kompact" leaves room to spare.



Inside, a neat layout that makes assembly easy . . . quality components for dependable operation.

Operate The KW Kompact In Your Car . . . With The HP-14 Power Supply



HP-14
\$89⁹⁵

- Excellent dynamic regulation • All solid-state circuitry • Efficient 1500 Hz switching frequency • Circuit breaker protection • Includes all interconnecting cables • Remote switching from KW Kompact front panel

PROVIDES HIGH VOLTAGE AND BIAS (ALL NECESSARY OPERATING VOLTAGES) FOR THE KW KOMPACT. The HP-14 Mobile Power Supply achieves exceptionally high efficiency and small size and weight through use of a toroidal core transformer and solid-state switching circuitry operating at a frequency of 1500 Hz. It is Heath-Engineered to be installed and forgotten . . . there are no fuses to replace, the circuit breakers reset automatically. HP-14 and the KW Kompact are recommended for operation with 12v. alternator equipped, negative ground cars only.

Kit HP-14, 10 lbs. . . No money down, \$9 mo. \$89.95

HP-14 SPECIFICATIONS—Input voltage: 12 to 14.5 v. DC (negative ground). Input current: 25 amperes average, 50 amperes peak (depends on input drive power to companion linear amplifier and voice characteristics). Allowable ambient temperature: —10° F. to 122° F. High voltage output: 2300 v. DC at no load, 2000 v. DC at 500 ma peak (approx. 170 ma average). Bias voltage: —130 v. DC no load, —110 v. DC @ 60 ma. Duty cycle: SSB, 50% (normal voice modulation). Switching frequency: 1500 Hz approx. Dimensions: 8¹/₁₆" W x 7³/₁₆" L x 2¹/₁₆" D.

Heathkit HP-24 Power Supply . . . For Fixed-Station Operation Of The KW Kompact



HP-24
\$49⁹⁵

- All solid-state circuitry • Remote switching from the KW Kompact front panel • All necessary operating voltages—HV, Bias, and Filament for the KW Kompact • Circuit breaker protection

PROVIDES ALL NECESSARY FIXED-STATION POWER FOR THE KW KOMPACT. The HP-24 features the high dynamic regulation required to produce clean SSB signals. And this well rated power supply produces less than 1% ripple voltage at its full peak power output (500 ma.). All connecting cables are included.

Kit HP-24, 22 lbs. . . No money down, \$5 mo. \$49.95

HP-24 SPECIFICATIONS—High voltage: 2500 v. max. with no load; 2000 v. DC at 300 ma; 1900 v. DC min. at 500 ma. Effective output capacitance: 21 ufd. Ripple: Less than 1% @ 500 ma. Duty cycle: SSB—50% @ 500 ma. peak; normal voice operation. CW—33% @ 500 ma; normal telegraphy operation. Bias voltage: —150 v. DC with no load; —100 v. DC @ 60 ma. Duty cycle: Continuous @ 20 v. ALC Threshold voltage: Approximately 6 v. DC. Filament voltage: 13 v. AC @ 4 amperes. Power requirements: 140 v., 50-60 Hz AC @ 16 amperes (max.); 240 v., 50-60 Hz AC @ 8 amperes (max.). Dimensions: 9" L x 4³/₁₆" W x 6³/₁₆" H.

Heathkit SB-100 . . . The Ultimate In 80-10 Meter SSB Transceivers

• 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 side-tone • Operates PTT or VOX • Transceiver tuning with Heath SB-Series LMO (Linear Master Oscillator, features 1 kHz dial calibration) or xtal-control transmit with VFO receive or crystal-control transceiver • Separate offset CW carrier crystal • Triple Action Level Control • Built-in kHz crystal calibrator • Quiet, enclosed relays • Fixed or mobile operation with the Heathkit HP-23 or HP-13 power supplies and SBA-100-1 mobile mount (below) • Fast assembly with circuit board and wiring harnesses • Simple, fast alignment—requires only a VTVM RF probe or VOM, a dummy load and a broadcast receiver

WE INVITE YOU TO COMPARE THE SPECIFICATIONS OF THE SB-100 WITH THOSE OF ANY OTHER MAKE OF SSB TRANSCEIVER . . . REGARDLESS OF PRICE! Write to Heath . . . we will provide you complete SB-100 specifications with schematic so that you may make your comparison in detail. Then talk to other hams who already own the Heathkit SB-100. You will discover it includes all of the high-performance innovations you've heard about.

HERE'S ENGINEERING THAT SETS THE PACE FOR THE INDUSTRY! The SB-100 features a 6 pole lattice filter (6 individual crystals) producing a superior 2 to 1 shape factor and symmetrical pass band. Result: Sharper receiver tuning. Greater sideband suppression. Identical characteristics on both upper and lower sideband signals. And SSB reception with steep skirts for adjacent signal rejection. What's more, the entire filter assembly is hermetically sealed to retain its published specifications.

HEATHKIT SWITCH-BOARD TECHNIQUE PRODUCES BETTER-THAN FACTORY-ASSEMBLED RESULTS! . . . virtually eliminates the point-to-point wiring common to tuning circuitry of other equipment . . . assures high mechanical stability, and minimum interaction between tuning circuits.

TALC (TRIPLE ACTION LEVEL CONTROL) SETS NEW STANDARDS FOR AUTOMATIC LEVEL CONTROL. Three separate circuits are combined in TALC to provide greater speech compression.

ORDER THE SB-100 FOR THE BEST VALUE IN SSB TRANSCEIVERS . . . REGARDLESS! Make your comparison. You will agree that the SB-100 is the best investment you can make in amateur radio equipment. (Recommended for hams with previous electronic or kit building experience.)

Kit SB-100, 23 lbs., \$36 dn., \$31 mo. \$360.00
SBA-100-1, Mobile Mounting Kit, 6 lbs. \$14.95
Kit HP-13, DC Power Supply, p. 78, 7 lbs., no money dn., \$6 mo. . . . \$59.95
Kit HP-23, AC Power Supply, p. 78, 19 lbs., no money dn., \$5 mo. . . . \$39.95

SB-100 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. **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:** 40 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 7.5; 14.0 to 14.5; 21.0 to 21.5; 28.0 to 28.5; 28.5 to 29.0; 29.0 to 29.5; 29.5 to 30.0 (megahertz). **Frequency stability:** Less than 100 Hz per hour after 20 minutes warm-up from normal ambient conditions. Less than 100 Hz for $\pm 10\%$ line voltage variations. **Modes of operation:** Selectable upper or lower sideband (suppressed carrier) and CW. **Dial accuracy—“resetability”:** Within 200 Hz on all bands. **Electrical dial accuracy:** Within 400 Hz after calibration at nearest 100 kHz point. **Dial mechanism backlash:** Less than 50 Hz. **Calibration:** 100 kHz crystal. **Audio frequency response:** 350 to 2450 Hz ± 3 db. **Phone patch impedance:** 8 ohm or 600 ohm receiver output to phone patch; high impedance phone patch input to transmitter. **Front panel controls:** Main (LMO) tuning dial; Driver tuning and Preselector; Final tuning; Final loading; Mic and CW Level Control; Mode switch; Band switch; Function switch; OSC Mode switch; Meter switch; RF gain control; Audio Gain control. **Internal controls:** VOX Sensitivity; VOX Delay; Anti-VOX; 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 connection:** CW Key jack; 8 ohm output; 600 ohm output; Phone patch input; ALC input; Power and accessory plug; RF output; Antenna switch; Receiver Antenna. **Power requirements:** 700 to 800 volts at 250 ma; 300 volts at 150 ma; —110 volts at 10 ma; 12 volts at 4.76 amps. **Cabinet dimensions:** 14 $\frac{1}{8}$ " W x 6 $\frac{1}{2}$ " H x 13 $\frac{3}{8}$ " D.

The World's Most Advanced

Heathkit SB-110 6-Meter SSB Transceiver . . . Puts Famous SB-Series Performance On VHF

• Full SSB-CW transceiver operation on six meters • 180 watts PEP SSB—150 watts CW • Switch select for Upper Sideband/Lower Sideband/CW operation • Operates PTT and VOX; VOX operated CW with built-in sidetone • Separate offset CW carrier crystal for clear, pure CW note • ALC and ANL • Built-in 100 kHz calibrator and antenna switching • Heath SB Series LMO (Linear Master Oscillator)—provides truly linear tuning • Covers 50-52 MHz with crystals supplied—total coverage 49.5-54 MHz • One kHz dial calibrations—bandsread equal to 10 feet per megahertz • Crystal filter SSB generator • Fixed station or mobile operation with the Heathkit HP-23 or HP-13 power supplies and SBA-100-1 mobile mount (below)

GET UNEQUALLED PERFORMANCE ON 6 METERS WITH THE HEATHKIT SB-110. Now you can work “six” with a truly high-performance rig! . . . get “Low Band” stability, plus PTT & VOX control, single knob tuning, switch selected modes for either crystal controlled transceiver or crystal controlled transmit with variable-tuning receiver, and operate CW or cross-mode.

A TRULY GREAT HERITAGE! The SB-110 provides full 6 meter transceiver operation with the same selectivity, stability, calibration, performance, and value already made famous by the Heathkit SB Series equipment for operation on 80-10 meters. Enjoy operating features that cannot be found in any other comparable transceiver on the market today! Discover the satisfaction of having a 6 meter signal with the real punch of SSB.

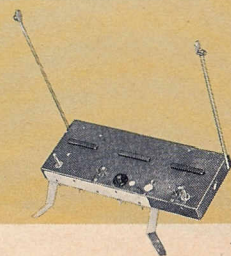
Kit SB-110, 23 lbs. . . \$32 dn., \$27 mo. \$320.00
Kit HP-13, DC Power Supply, 7 lbs. . . no money dn., \$6 mo. . . . \$59.95
Kit HP-23, AC Power Supply, 19 lbs. . . no money dn., \$5 mo. . . . \$39.95
Kit SBA-100-1, Mobile Mounting Kit, 6 lbs. \$14.95

SB-110 SPECIFICATIONS—RECEIVER SECTION: Noise Figure: 3 db or less. Sensitivity: 0.1 uv for 15 db signal-plus-noise to noise ratio. Selectivity: 2.1 kHz @ 6 db down, 5 kHz max. @ 60 db down. Image Rejection: 50 db or better. IF Rejection: 50 db or better. **Antenna Input Impedance:** 50 ohm nominal (unbalanced). **Audio Output Impedance:** Speaker, 8 ohms. Headphones, 600 ohms or higher. **Audio Output Power:** 1 watt. **AGC Characteristics:** Audio output level varies less than 10 db for 50 db change of input signal level (0.5 uv to 150 uv). **TRANSMITTER SECTION:** **DC Power Input:** SSB, 180 watts PEP. CW, 150 watts PEP. **RF Power Output:** SSB, 100 watts PEP. CW, 90 watts (50 ohm non-reactive load). **Output Impedance:** 50 ohm nominal with not more than 2:1 SWR. **Carrier Suppression:** 55 db down from rated output. **Unwanted Sideband Suppression:** 55 db down from rated output @ 1000 Hz and 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 $\pm 10\%$ supply voltage variations. **Modes of Operation:** SSB, single sideband (suppressed carrier, with selectable upper or lower sideband). Tune, continuous wave. CW, keyed continuous wave (800 Hz offset crystal for cross-mode operation between USB and CW). **Dial Accuracy:** Electrical, within 400 Hz on all band segments, after calibration at nearest 100 kHz point. Visual, within 200 Hz. **Dial Backlash:** No more than 50 Hz. **Calibration:** Every 100 kHz. **Intermediate Frequencies:** Receiver First IF & Transmitter Second IF, 8.395 to 8.895 MHz passband. Receiver Second IF & Transmitter First IF, 3.395 MHz center frequency. **Power Requirements:** High voltage, +700 v. DC @ 250 ma with 1% max. ripple. Low voltage, +250 v. DC @ 100 ma with .05% max. ripple. Bias voltage, —115 v. DC @ 10 ma with .5% max. ripple. Filament voltage, 12.6 v. AC/DC @ 4.355 amps. **Dimensions:** 14 $\frac{1}{8}$ " W x 6 $\frac{1}{2}$ " H x 13 $\frac{3}{8}$ " D.

Universal Mounting Bracket For SB-100 & SB-110

GO MOBILE WITH THE SB-110 OR SB-100! 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





SB-100
\$360⁰⁰

Amateur Band SSB Transceivers



SB-110
\$320⁰⁰



AMATEUR RADIO

Heathkit® Deluxe SB-Series . . . Unsurpassed



SB-301
\$260⁰⁰



SB-600
\$17⁹⁵

280.95
150.
130.95

New! . . . Heathkit SB-301 Amateur Band Receiver Now With These Extra-Performance Features . . .

- Increased sensitivity • RTTY position on mode switch—SB-301 is now a fully capable RTTY Receiver! • 15 to 15.5 MHz coverage for WWV reception • Built-in switch-selected ANL (Automatic Noise Limiter) • Front-panel switching for control of 6 and 2 meter plug-in converters—enables convenient amateur band tuning from 80 through 2 meters • Simplified assembly procedure through "sub-pack" packaging & assembly techniques • Improved product detector and audio circuitry for better reception

Plus These Pace-Setting Features That Have Already Made The SB-300 Famous In Amateur Radio . . .

- 80 through 10 meter amateur bands with crystals furnished, plus provision for VHF converters • 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 dial to knob ratio approx. 4-to-1 • Provision for transceive operation with matching SB-401 Transmitter • Pre-built Linear Master Oscillator (LMO), wiring harness and two heavy-duty circuit boards for fast, easy assembly

THE NEW SB-301 RAISES THE STANDARDS FOR AMATEUR BAND RECEIVERS . . . brings full RTTY reception capability to the SB-Series, plus amateur band coverage from 80 through 2 meters to your finger tips when the plug-in converters are installed. The new 15 to 15.5 MHz tuning range enables the most accurate attainable frequency check on the built-in 100 kHz crystal calibrator (by WWV), and the ANL feature now provides impulse noise rejection for the receiver. Signals received in high noise locations are now easily readable! Order the new SB-301 for unmatched value in a deluxe single-sideband amateur radio communications receiver.

NEW "SUB-PACK" PACKAGING & ASSEMBLY SPEEDS CONSTRUCTION TIME. Components are packaged separately for each phase of construction . . . saves you time in selecting components . . . lets you see your progress more clearly as each phase is completed.

WHEN COMPARING THE SB-301 WITH OTHER RECEIVERS . . . notice the Heath pre-built LMO (Linear Master Oscillator), the heart of SB-301 tuning, surpasses the tuning characteristics of every other receiver on the market. The SB-301 provides receiver tuning with bandspread equivalent to 10 feet per megahertz . . . truly linear tuning over the entire receiver coverage . . . the good solid feeling of tuning

a non-backlash vernier dial mechanism . . . plus the ultimate in tuning repeatability that means real satisfaction in on-the-air performance. Check and compare the specifications and features with those of any other SSB receiver on the market and see what an outstanding dollar-value the SB-301 represents!

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

SB-301 SPECIFICATIONS—Frequency range (megahertz): 3.5 to 4.0, 7.0 to 7.5, 14.0 to 14.5, 15.0 to 15.5, 21.0 to 21.5, 28.0 to 28.5, 28.5 to 29.0, 29.0 to 29.5, 29.5 to 30. Intermediate frequency: 3.395 megahertz. Frequency stability: Less than 100 Hz per hour after 20 min. warmup under normal ambient conditions. Less than 100 Hz for $\pm 10\%$ line voltage variation. Visual dial accuracy: Within 200 Hz on all bands. Electric dial accuracy: Within 400 Hz on all bands after calibration at nearest 100 kHz point. Backlash: No more than 50 Hz. Sensitivity: Less than 0.3 microvolt for 10 db signal-plus-noise to noise ratio for SSB operation. Modes of operation: Switch selected; LSB, USB, CW, AM, RTTY. Selectivity: RTTY; 2.1 kHz at 6 db down, 5.0 kHz at 60 db down (crystal filter supplied). SSB; 2.1 kHz at 6 db down, 5.0 kHz at 60 db down (crystal filter supplied). AM; 3.75 kHz at 6 db down, 10 kHz at 60 db down (crystal filter available as accessory). CW; 400 Hz at 6 db down, 2.0 kHz at 60 db down (crystal filter available as accessory). Spurious response: Image and IF rejection better than 50 db. Internal spurious signals below equivalent antenna input of 1 microvolt. Audio response: SSB; 350 to 2450 Hz nominal at 6 db. AM; 200 to 3500 Hz nominal at 6 db. CW; 800 to 1200 Hz nominal at 6 db. Audio output impedance: Unbalanced nominal 8 ohm speaker and high impedance headphone. Audio output power: 1 watt with less than 8% distortion. Antenna input impedance: 50 ohms nominal. Muting: Open external ground at Mute socket. Crystal calibrator: 100 kHz crystal. Front panel controls: Main tuning dial; function switch; mode switch; AGC switch; band switch; AF gain control; RF gain control; preselector; connector & ANL switch; phone jack. Rear apron connections: Accessory power plug; HF antenna; VHF #1 antenna; VHF #2 antenna; mute; spare; anti-trip; 500 ohm; 8 ohm speaker; line cord socket; heterodyne oscillator output; LMO output; BFO output; VHF converter switch. Tube complement: (1) 6BZ6 RF amplifier (1) 6AU6 Heterodyne mixer; (1) 6AB4 Heterodyne oscillator; (1) 6AU6 LMO osc.; (1) 6AU6 LMO mixer; (2) 6BA6 IF amplifier; (1) 6AU6 Crystal calibrator; (1) 6HF8 1st audio, audio output; (1) 6AS11 Product Detector, BFO, BFO Amplifier. Power supply: Transformer operated with silicon diode rectifiers. Power requirements: 120 volts AC, 50/60 Hz, 50 watts. Dimensions: 14 $\frac{1}{2}$ " W x 6 $\frac{1}{2}$ " H x 13 $\frac{3}{8}$ " D. Net weight: 17 lbs.

New Heathkit Communications Speaker—Matches SB-Series Gear

HERE'S THE FINAL TOUCH TO A COMPLETE AND PROFESSIONAL SB-SERIES STATION . . . the SB-600 provides space to mount the HP-23 AC power supply out of sight in a cabinet that boasts neat, clean styling to match the SB-Series of Heathkit Amateur Gear. The 8 ohm 6" x 9" speaker features communications response—300 to 3000 Hz. Cabinet dimensions: 10" W x 6 $\frac{1}{2}$ " H x 10 $\frac{1}{2}$ " D.

SB-600, 5 lbs. \$17.95

6 & 2 Meter Plug-In Converters For The SB-301

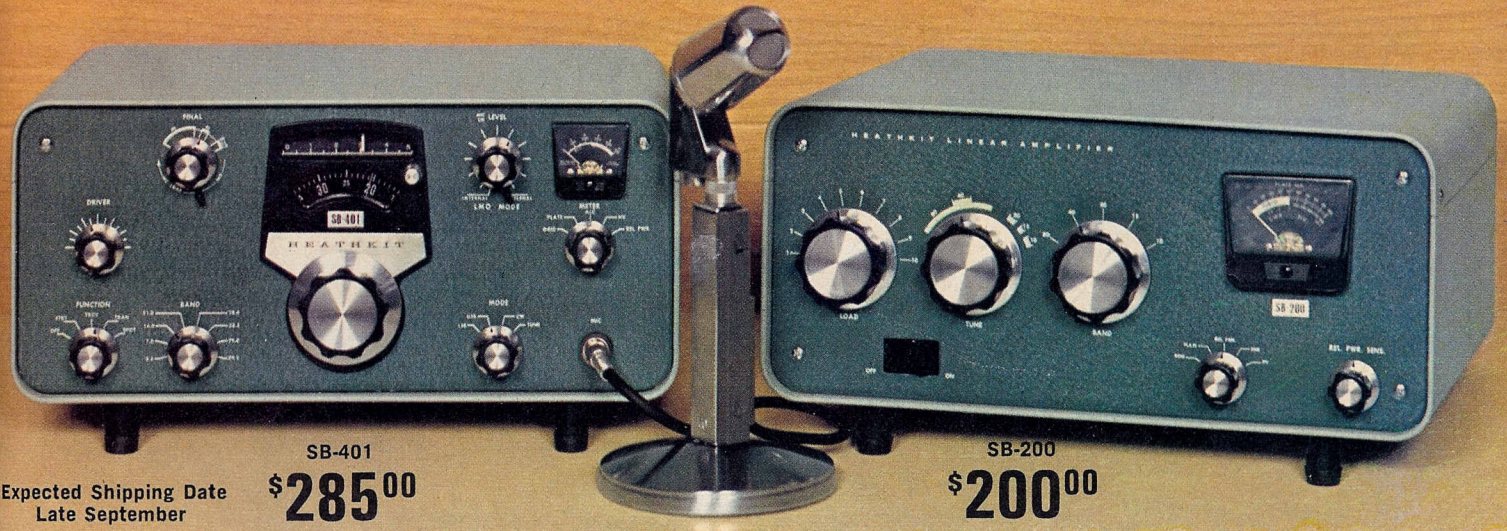
NOW YOU CAN HAVE 80 THROUGH 2 METER BAND COVERAGE AT THE TWIST OF A KNOB! Either the 6 or 2 meter converter may be switch selected from the front panel of the new SB-301 receiver. The 6-meter model covers 48 to 54 MHz (50 to 52 MHz with crystal supplied) and the 2-meter model extends receiver coverage 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 $\pm 0.005\%$, 3rd overtone. Tube complement: 6DJ8 cascade RF amplifier, 6EA8 oscillator-mixer. Power requirements: 120 v. @ 12.5 milliamperes, 6.3 v. AC @ 815 milliamperes. Dimensions: Overall, 2 $\frac{1}{2}$ " W x 5 $\frac{3}{4}$ " L x 3 $\frac{3}{4}$ " H.

SBA-300-4 SPECIFICATIONS—Sensitivity (signal plus noise-to-noise in db) AM, less than 0.2 uv for 6 db @ 3750 Hz bandwidth; SSB, less than 0.2 uv for 12 db @ 2100 Hz bandwidth; CW, less than 0.2 uv for 20 db @ 400 Hz bandwidth. Noise figure: 7 db or less. Frequency: Input, 142 to 150 MHz (144 to 146 MHz with crystal supplied); output, 28 to 30 MHz. Bandpass: Essentially flat over any 2 MHz segment from 142 to 150 MHz. Image rejection: 80 db or better at 88 MHz. IF rejection: 50 db or better at 29 MHz. Crystal: 38.67 MHz $\pm 0.003\%$, 3rd overtone. Tube complement: 6DJ8 cascade RF amplifier, 6EA8 oscillator-triplexer-mixer. Power requirements: 130 V. DC @ 12.5 milliamperes, 6.3 V. AC @ 815 milliamperes. Dimensions: Overall, 2 $\frac{1}{2}$ " W x 5 $\frac{3}{4}$ " L x 3 $\frac{3}{4}$ " H.

Value And Performance For The Radio Amateur



Expected Shipping Date
Late September

SB-401
\$285⁰⁰

SB-200
\$200⁰⁰

260.00 7658
 200
 78
1250 1200

New! . . . Heathkit SB-401 SSB Amateur Band Transmitter—Greater Convenience and Value

- Single panel switch selects transceiver or independent operation of SB-401 and SB-301 (or SB-300) combination—no cable changing required • Can be operated as an independent transmitter with any receiver when SBA-401-1 crystal group is installed • New simplified assembly procedure through modular "sub-pack" packaging & assembly techniques • Built-in power supply • Built-in antenna change-over relay • LMO (Linear Master Oscillator) frequency control • ALC (Automatic Level Control) for higher talk power • 180 watts PEP SSB, 170 watts CW • Crystal filter SSB generation • Operates upper or lower sideband • VOX and PTT control • 1 kHz dial calibration—100 kHz per dial revolution • 500 kHz coverage per band-switch position

VALUE COMPANION TO THE SB-301 OR SB-300. The Heathkit SB-401 provides full transceiver 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 transceiver operation to independent transmitter-receiver operation with a flip of a single switch on the SB-401 front panel . . . perfect for DXing! The SB-401 derives all the necessary crystal oscillator voltages from the SB-301 or SB-300 . . . eliminates redundant circuitry! Include the SBA-401-1 crystal pack for complete, independent transmitter operation with receivers other than the SB-301 or SB-300.

UNIQUE DESIGN FEATURES. The SB-401 employs compactron tubes for space-saving component layout, and heavy-duty circuit board construction plus precut wiring harness enables fast assembly, assures stable operating characteristics. Complete shielding and isolation of circuits provides a maximum of TVI protection.

NEW EASY ASSEMBLY TECHNIQUE! Use of "modular sub-pack" packaging and assembly procedure adds even greater pleasure and satisfaction to building this deluxe rig . . . like building small kits within a kit! The prebuilt LMO and crystal SSB filter eliminate critical alignment. Make the SB-401 your next ham radio project.

Kit SB-401, 34 lbs. . . No money down, \$27 mo. Expected Shipping Date Late September . . . **\$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. 77 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). Backlash: Less than 50 Hz. Oscillator feedthrough or mixer products: 55 db below rated output (except 3910 kHz crossover which is 45 db). Harmonic radiation: 35 db below rated output. Audio input: High impedance microphone or phone patch. Audio frequency response: 350-2450 Hz ±3 db. Power requirements: 80 watts STBY, 260 watts key down @ 120 V AC line. Dimensions: 14 1/4" W x 6 1/2" H x 13 3/4" D.

Heathkit SB-200 Desk-Top Linear Amplifier 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

IMAGINE BUYING A COMPLETE KW SSB LINEAR AMPLIFIER FOR ONLY \$200! Yet here it is . . . a single, compact unit with its own built-in power supply and SWR meter. The SB-200 provides up to 1200 watts P.E.P. input SSB and 1000 watts CW. It requires only 100 watts P.E.P. driving power.

LATEST DESIGN FEATURES. You'll find many advance-design features throughout this superb Linear . . . such as the pre-tuned cathode input circuit for maximum efficiency and low distortion . . . ALC output for automatic exciter control . . . two heavy-duty 572B/T-160-L final amplifier tubes, fan-cooled for maximum life . . . complete shielding for TVI protection and stability . . . a rugged, conservatively-rated solid-state power supply, circuit-breaker protected (no fuses to replace or worry about) . . . plus a built-in SWR meter and antenna relay for extra operating convenience (Antenna is automatically switched to the exciter when the linear is switched "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. Well-rated components will provide years of dependable service.

IT'S EASY TO GO HIGH POWER . . . when you choose the SB-200. If you've been yearning for a full gallon, put the SB-200 on your desk top. Here is high quality, high power single sideband & cw at the price you've been waiting for. Order your SB-200 today.

Kit SB-200 . . . 41 lbs. . . No money down, \$19 mo. **\$200.00**

SB-200 SPECIFICATIONS—Band coverage: 80, 40, 20, 15 & 10 meters. Maximum power input: 1200 watts P.E.P. SSB, 1000 watts CW. Driving power required: 100 watts. Duty cycle: SSB, continuous voice modulation; CW, 50% (key down time not to exceed 5 min.). Third order distortion: 30 db or better at 1000 watts P.E.P. Output impedance: 50 to 75 ohm unbalanced; variable pi-output circuit. SWR not to exceed 2:1. Input impedance: 52 ohm unbalanced; broad-band pretuned input circuit requires no tuning. Meter functions: 0-100 ma grid current, 0-1000 ma plate current, 0-1000 relative power, 1:1 to 3:1 SWR, 1500 to 3000 volts high voltage. Front panel controls: Load; Tune; Band; Relative Power Sensitivity; Meter Switch, Grid-Plate-Rel. Power-SWR-HV; and Power Switch, on/off. Tube complement: Two 572B/T-160-L (in parallel). Power requirements: 120 volts AC @ 16 amperes (max.), 240 volts AC @ 8 amperes (max.). Cabinet size: 14 1/4" W x 6 1/2" H x 13 3/4" D. Net weight: 35 lbs.

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.

Heathkit® Monitor Scope For Amateur Radio



New! SB-610 Signal Monitor Shows Transmitted Or Received Signals

- Features new versatility—operates with transmitters 160 through 6 meters, 15 watts through 1 KW—operates with receiver IF's through 6 MHz—includes full capability for displaying RTTY signals
- Designed & styled to operate with Heath SB-Series equipment
- Provisions to operate with virtually any other equipment on the market
- Displays signal envelope, AF & RF trapezoid patterns
- Fully mu-metal shielded CR tube
- Improved two-tone audio test oscillator with separate balance and output level controls
- Easier & faster assembly
- Simple to connect and operate
- Shows the quality of signals you transmit & receive
- Manual includes instructions for interpreting waveforms

ONLY HEATH COULD IMPROVE ON THE WORLD'S MOST WIDELY CHOSEN AMATEUR SCOPE! Now you can get a Signal Monitor Scope matching the famous Heath SB-Series in both appearance and performance. The new SB-610 Signal Monitor is designed to operate with your SB-Series equipment, plus it features all necessary circuit provisions for operation with virtually any other gear on the market today. Use it for checking AM, CW, SSB signals, and the new SB-610 is also fully capable of displaying RTTY signals.

DISPLAYS ACTUAL SIGNAL WAVEFORMS . . . use of the SB-610 enables you to make an accurate analysis of your transmitted or received signals. It positively identifies waveform distortion, such as over modulation, etc. . . . enables exact tuning to RTTY signals. The comprehensive assembly and operating manual shows you how to connect your Signal Monitor, and then how to interpret the signal waveforms. Various wiring options permit assembly for use with any one of the receiver IF's listed in the specifications below. You can be assured that your amateur radio gear is performing properly when Monitor Scope waveforms are "clean" . . . add this valuable instrument to your amateur station today.

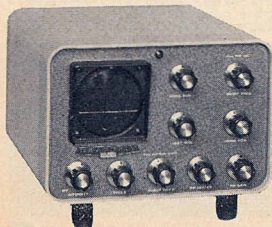
Kit SB-610, 14 lbs. . . no money dn., \$7 mo. \$69.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

SB-610 SPECIFICATIONS—Receiver IF's: Up to 455, 1600 to 1680, 2075, 2215, 2475, 3000, 3055, 3395, and 5000 to 6000 kHz. **VERTICAL AMPLIFIER: Vertical response (for 1 inch deflection):** Untuned: RTTY, 1 volt nominal; 20 kHz-455 kHz, less than 500 mv. Tuned: 455 kHz, 70 mv nominal; 1600-2500 kHz, less than 200 mv; 3000-3400 kHz, less than 500 mv; 5000-6000 kHz, less than 700 mv. **Input resistance:** 100 k ohm. **HORIZONTAL AMPLIFIER: Horizontal response:** ±3 db from 3 Hz to 15 kHz. **Sensitivity:** 800 mv per inch deflection. **Input resistance:** 1 megohm. **Sweep generator:** Recurrent type, sawtooth 15 to 200 Hz (variable). **Tone oscillators:** Approximately 1500 & 1950 Hz with 100 mv (nominal) output. **GENERAL: Frequency coverage:** 160—6 meters (50-75 ohm coaxial input). **Power limits:** 15 watts to 1 kilowatt (with special instructions for CB power levels). **Front panel controls:** Function Selector, Sweep Frequency, Tone Generator, Horizontal Gain, Horizontal Position, Vertical Position, Vertical Gain, Focus, Intensity/Off. **Rear control:** Xmtr. Atten. Attenuates 0 to 24 db at approximately 8 db per step. **Power supply:** Transformer operated, fused ½ amp. **Power requirements:** 120 VAC 50/60 Hz, 35 watts. **Dimensions:** 6" H x 10" W x 11 1/8" D (including knobs).

Available Soon! New Model SB-620 "Hamscan" Spectrum Monitor

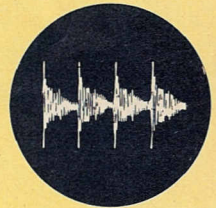
- New narrow sweep function with crystal lattice filter for single signal analysis
- Increased wide sweep capability for monitoring larger band segments
- Matches SB-Series in style and performance
- Operates with common receiver IF's up to 6 MHz
- Retains all other high-performance features of its HO-13 predecessor

WATCH FOR FULL DETAILS IN THE CHRISTMAS FLYER! The new SB-620 "Hamscan's" features include a new voltage doubler power supply . . . fully mu-metal shielded CRT . . . easier assembly techniques . . . simple connection to receiver and more.



These And Other Transmitter Envelope Patterns Are Shown In The SB-610 Manual . . . Aid Immeasurably In Trouble Shooting

SSB signal, voice input, correctly adjusted.



Normal SSB signal, two tone, input, tones properly adjusted for equal amplitude.

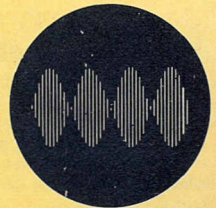
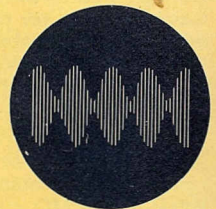
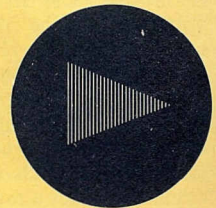


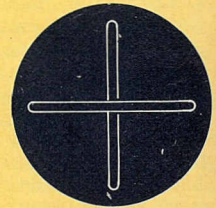
Plate modulated AM, nearly 100% modulated.



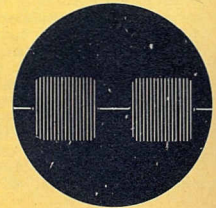
RF trapezoid. Good linearity. Desirable pattern.

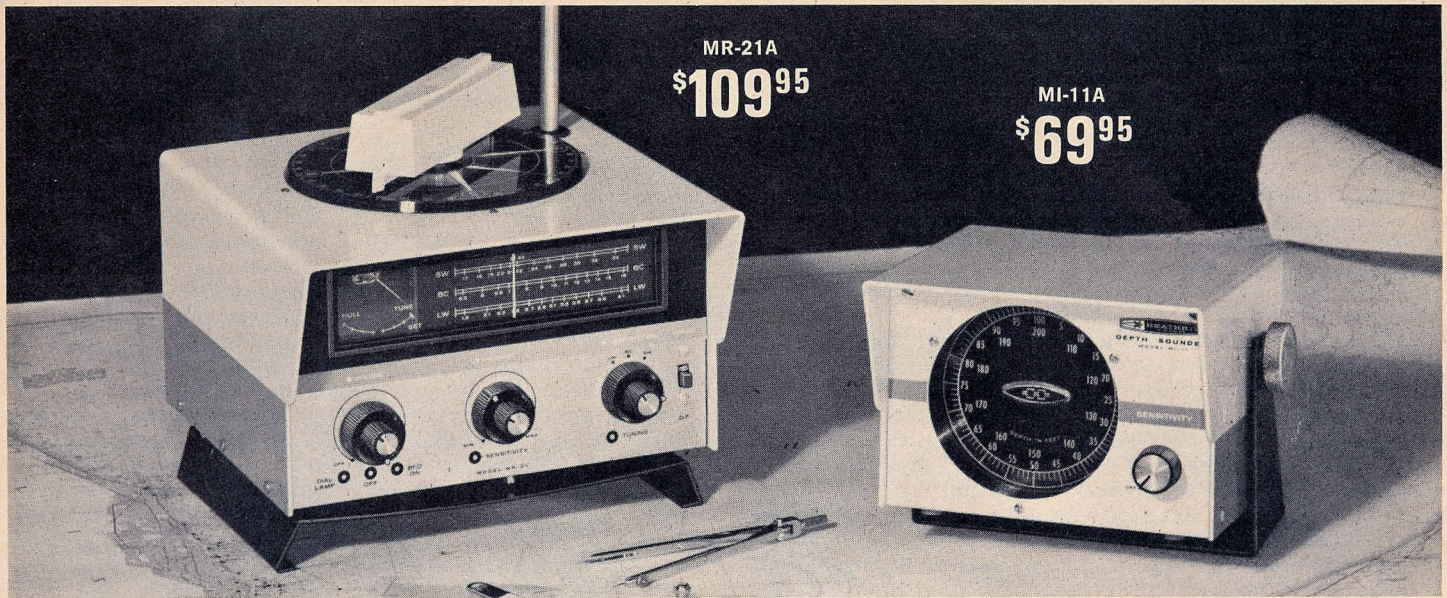


RTTY signal, proper shift, correctly tuned in.



Good CW pattern, string of dots indicating properly shaped keying.





MR-21A
\$109⁹⁵

MI-11A
\$69⁹⁵

Heathkit "Mariner" 3-Band RDF 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

CRUISE WITH SAFETY . . . Your "Mariner" is always ready to show you exactly where you are through accurate triangulation—as easy as reading a map. "Mariner" provides you with weather bulletins . . . doubles as a communications receiver in emergencies . . . even entertains you and your crew with music, news, and sports.

CRUISE RELAXED . . . SURE. "Mariner" resolves the problem of the double null. All three extra-sensitive bands of the MR-21A provide long range, accurate bearings. Strong or weak signals, the front panel "Sensitivity" control sharpens the accuracy of the tuning null. Automatic gain control circuitry makes it a deeper, more distinct null. And the signal phasing sense circuit assures that it is the correct null . . . the true bearing. Read it directly from the 6½" compass rose located beneath the rotary loop antenna, then begin plotting your position on your chart . . . sure and accurate. Your "Mariner" and your compass are your two most valuable navigation instruments.

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

Order this performance proved and value leader for your boat now.

Kit MR-21A, 13 lbs. . . No money down, \$11 mo. \$109.95

MR-21A SPECIFICATIONS—Beacon band: 188 to 410 kHz. **Broadcast band:** 535 to 1620 kHz. **Marine band:** 1650 to 3450 kHz. **Sensitivity for 6 DB signal-to-noise ratio:** BC band, 40 uv/meter; Beacon band, 70 uv/meter; Marine band, 20 uv/meter. **Normal bearing accuracy:** ±3°. **BFO:** 455 kHz, switch-selected. **Speaker:** 4" x 6" weather-proofed. **Power requirements:** 9 volts from 6 standard size "D" flashlight batteries. **Battery drain:** 90 ma @ 350 mw max. output level. **Battery life:** 500-1000 hours. **Dial light:** Spring-return switch operated. **Null & Tuning indicator:** 0-1 ma meter. **Transistors:** (1) 2N409 Sense amplifier; (1) T1363 RF amp.; (1) 4JX-1D925 Oscillator; (1) 2N1526 mixer; (5) 2N1274 AGC amp., audio amp., audio output, & BFO oscillator; (2) T1364 1st & 2nd I.F.; (1) crystal diode detector. **Dimensions:** 10" H x 10" W x 8½" D, including base and loop.

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.

Heathkit MI-11A Depth Sounder . . . Safety For The Yachtsman . . . An Aid To The Fisherman

- 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

AVOID THE EMBARRASSMENT OF RUNNING AGROUND . . . OR WORSE YET, THE COST OF REPAIRS. There's no need to wonder about the depth of your sailing water when your boat is equipped with the all-transistor Heathkit Depth Sounder. It "senses" shoal depths with 5% accuracy on all readings . . . probes down to 200' on hard sandy bottoms, 100' on soft muddy 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. And the MI-11A is an invaluable aid for cruising rivers and inland waterways.

COMPARE WITH MORE COSTLY UNITS. The sensitive all-transistor circuits 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.

STYLED TO COMPLIMENT YOUR BOAT . . . the large black shaded dial with big white numerals reads easily. Attractive rustproof metal cabinet is finished in nautical gray, white, black, and blue color styling. And a gimbal mounting bracket permits installation virtually anywhere. Includes transducer.

ASSEMBLES IN JUST 4 TO 6 HOURS with stable, durable, fiberglass circuit board construction . . . takes no special skills or knowledge. Your assembly manual is complete in every detail. Order your MI-11A for more pleasurable boating.

Kit MI-11A, 8 lbs. . . No money down, \$7 mo. \$69.95

Accessory transducer mount; Model MIA-11, 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 a 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.



Choose Marine Electronics With

A Heathkit Marine Power Converter Provides Shore-Side Power For Small Appliances

• Converts 6 or 12 volt battery power to square wave 117 V. AC • Delivers up to 175 watts for small electric devices • All transistor circuit • Two AC receptacles

A COMPACT POWER CONVERTER FOR BOAT, TRAILER, OR CAR . . . measures only 7 $\frac{3}{8}$ " x 5 $\frac{1}{8}$ " x 4 $\frac{3}{4}$ ". Provides household power for incandescent lamps, electric shavers, etc., from 6 or 12 v. batteries. Not recommended for TV, tape recorders, record players, compressor-type refrigerators, etc., which require high starting current and/or standard sine wave, rather than square wave AC power for normal operation. 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.

B Heathkit Fuel Vapor Detector An Absolute "Must" For Power Boats And Auxiliaries

• 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

FIRE AT SEA! . . . YOUR MOST FEARSOME PERIL! You can't afford to overlook any precaution or safety feature . . . and a sensitive Fuel Vapor Detector is your best assurance against explosion due to accumulated gasoline fumes. When you "check-out" your completed MI-25, the sensitivity of this instrument will amaze you . . . the smallest traces of combustible gasses are detectable. The new MI-25 Fuel Vapor Detector features a performance proven detector "head," plus new advanced circuitry to provide even greater security. In addition to the "SAFE—DANGEROUS—EXPLOSIVE" meter reading, a built-in 2500 Hz audible alarm sounds whenever fumes are present. Power & detector cables unplug from the unit for fast, easy removal from your boat. The Heathkit MI-25 is your best assurance to a safe voyage.

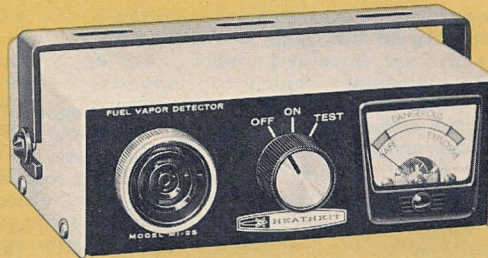
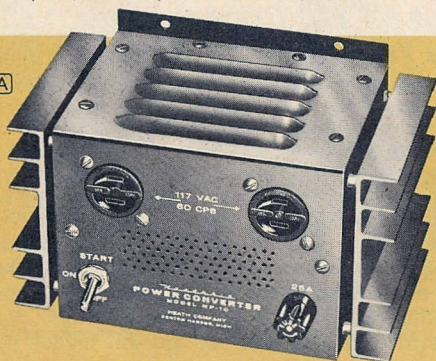
Kit MI-25, 3 lbs. . . no money down, \$5 mo. \$39.95

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

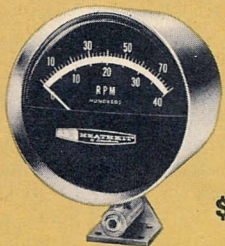
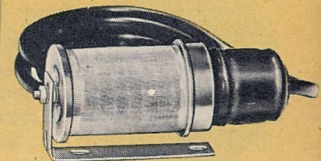
MP-10 Kit

\$29⁹⁵

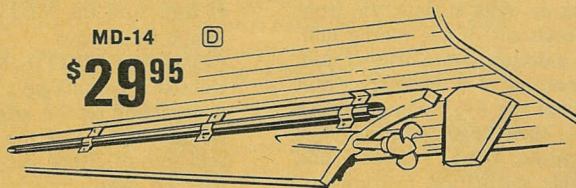
Wired \$39⁹⁵



MI-25 \$39⁹⁵



MI-13A \$24⁹⁵



MD-14 \$29⁹⁵



MDP-104 \$20²⁹

C All-Transistor Tachometer For Boat Or Car

• All-Transistor circuit for maximum versatility & accuracy (2%) • Operates on 6, 12, 24, or 32 V. DC systems • 2 switch-selected ranges • Lighted dial for easy night reading • Simple to build & install PERFECT FOR THE OUTBOARD CRUISER. Helps you achieve optimum fuel economy on cruises . . . works on all inboard or outboard marine and auto engines (1-6 cylinder, 2 cycle or 1-16 cylinder, 4 cycle) that use standard (not transistorized) coil and distributor ignition systems. Features switch selection of 0-4000 and 0-8000 rpm ranges, plus wiring option for 0-2000 and 0-4000 rpm. 2 transistors, Zener diode. Unaffected by normal voltage or temp. variation. Ball and socket mount. Positive or negative ground. Kit MI-31A, 3 lbs. . . no money dn., \$4 mo. \$24.95

D Heathkit Marine Electrical Ground System

• Provides recommended grounding surface • Simple, foolproof keel installation • Simple thru-hull connection to ground system • Ideal for single or dual engine equipped boats HUNDREDS IN USE. Extends radio range . . . the MD-14 is more than adequate for most boat electrical systems. Two 8' heavy-gauge copper tubes, tapered at ends, minimize water resistance, require only bolting through keel (min. length 9', max. thick. 5") and 1 through-hull fitting. Does not affect balance, steering, or maneuverability of craft. Corrosion-proof. Won't catch on rocks, logs, etc. The answer to most radiotelephone problems is an adequate ground . . . the Heathkit MD-14 is the answer. Kit MD-14, 20 lbs. (Motor Freight or Express only), no money dn., \$5 mo. \$29.95

E University Deck Speaker

HEATH RECOMMENDED HORN PROJECTOR . . . the MDP-104 is excellent for use as a deck monitor or deck hailer speaker with the MWW-14A & MWW-15 Radiotelephones. The driver unit and horn are weather-proof and feature a marine-gray finish which may be painted, if desired. The mounting bracket permits "any-angle" installation and has a neat, "ship-shape" appearance on the deck of your craft. The well-rated specifications are: power rating, 25 watts; impedance, 8 ohms; frequency response, 200 to 13,000 Hz. Model MDP-104, 7 lbs. . . mfrs. list \$34.50 . . . Net \$20.29



the Famous Heath Heritage



Heathkit Fog Horn/Hailer/Boat Horn All Transistor For Instant Operation

- Instant operation—no waiting for warm-up • Just flip a switch to use as a fog horn, deck hailer, or boat horn • All-transistor 30-watts peak circuit . . . powerful, dependable • 10" Weatherproof horn speaker for deck mounting • Fused for protection • Gimbal mounting bracket for versatile installation • Marine styled in black, gray & white • Fast, stable circuit board construction

USE IT AS A FOGHORN . . . The new MD-24 provides a powerful warning tone that penetrates the foggy atmosphere for more than a mile. Just set the function switch to "foghorn" and the electrically-timed tone sounds for six seconds, rests for twenty seconds, then recycles.

USE IT AS A DECK HAILER The MD-24 projects your voice up to several hundred yards. No garbling at higher talk powers as with other



MD-24
\$79⁹⁵

MWW-13AS
Complete Pre-Tuned System
\$189⁹⁵

Heath-Built 25-Watt Radiotelephone For The Small Sailing Auxiliary Or Medium Cruising Range Power Craft

- Choose complete system for owner installation on outboards or separate unit for installation on any boat with technician check-out • 4 crystal-controlled transmit & receive channels • Covers 2-3 MHz marine & standard AM bands • 10-transistor, 5-diode, 3-tube circuit • Built-in heavy-duty transistor power supply • FCC type accepted • Compact, factory assembled & ready to install

PRACTICAL COMMUNICATIONS FOR MARINERS ON THE GO. Go ahead, set that course to "cruise." You can take off on those longer jaunts with a new sense of confidence when you have the knowledge that your reliable MWW-13A is ready to put you in instant touch with the Coast Guard, other ships, or the phone company. Also tunes AM broadcast band to keep you in touch with weather and news.

ORDER THE COMPLETE DO-IT-YOURSELF PACKAGE MWW-13AS FOR OWNER INSTALLATION ON OUTBOARD CRUISERS. Includes 25-watt Radiophone with gimbal mounting bracket; 13' antenna (MDP-93); ground, antenna, and power cables; crystals for two channels (2182 & 2638 kHz); push-to-talk microphone; FCC license pack; and complete installation and operating instructions. No technician tune-up required when outboard motor is used as ground per instructions.

ORDER THE MWW-13A RADIOTELEPHONE FOR ANY SMALL BOAT, SAIL OR POWER. Install it yourself. Electrical connection to the internal ballast on fiberglass boats makes a near-perfect ground. Microphone, gimbal mounting bracket, and crystals for 2182 & 2638 kHz (calling-distress & ship-to-shore frequencies) are all included. Just have an FCC licensed technician tune up and check out your installation.



MWW-13A
Radiophone
\$164⁹⁵

**13' Fiberglass Radio-
phone Antenna for MWW-
13A** . . . covers 2-3 MHz.
Includes side mount and
built-in loading coil.
MDP-93 . . . \$34.95
Swivel lay-down base,
MDP-103 . . . \$9.95

models. "Hail Gain" control lets you adjust the power to suit conditions. Excellent for docking, fueling, and hailing other boats . . . just turn the switch to "Hail" and use the "push-to-talk" microphone.

USE IT AS A BOAT HORN Push the panel-mounted horn button for a 30-watts peak-power blast to warn other craft, signal for bridge openings, etc.

DESIGNED FOR YEARS OF RELIABLE PERFORMANCE . . . the efficient, powerful, all-transistor circuitry assures dependable performance at all times. Runs cool, thanks to conservative design. No component deterioration as with tube-type units.

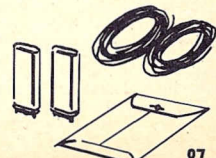
Kit MD-24, Includes basic unit, plus PTT mike, & 10" deck speaker, 12 lbs. . . . No money down, \$8 mo. . . . **\$79.95**

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

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) 2N1525 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 RF watts. **Transmitter tube complement:** (1) 6AK6 Oscillator; (2) 6AQ5 amp. **Power requirements:** 12 V DC, receiver only, .350 amps.; standby, 1.2 amps.; transmit, 5 amps. **Dimensions:** 4 1/2" H x 8 1/4" W x 10 1/2" D.

Complete Package MWW-13AS For Do-It-Yourself Outboard Installation! Includes: 25-watt Radiotelephone, "gimbal" mounting bracket, 13' antenna (MDP-93), antenna cable, ground cable, power cable, crystals, push-to-talk microphone, FCC License pack and complete instructions!



A Now . . . New Low Price!

Heath-Built 150 Watt Marine Radiotelephone

With Optional Channel-Switching Remote Control

- 150 watt power input • 8 crystal-controlled transmit & receive channels • Covers 2-3 and 4-5 MHz marine bands • Receives standard AM broadcast • 15-watt amplifier for deck hailing • Provisions for full remote control operation, including channel switching
- All-transistor receiver with R.F. stage for long range—ceramic Transfilters® for extra selectivity • Local-Distance switch • Heavy-duty solid-state power supply for added margin of dependability • Solid-state modulator for full audio power • FCC type accepted for commercial (party boat) use and DOT approved • Completely assembled & tested
- Owner's manual includes all information for installation & operation

THE HEATH MWW-15 RADIOTELEPHONE SETS NEW STANDARDS FOR MARINE ELECTRONICS . . . dollar per watt, dollar per feature, there's no better value! The MWW-15 with its 150 watts of power reaches out all the way when you need it, contacting other ships, the Coast Guard, and the telephone company—up to 150 miles away! MWW-15 provides complete communications facilities plus AM broadcast reception. Features variable squelch control & automatic noise limiting; a "Local-Distance" switch to prevent receiver overload from strong signals; Transfilters® to minimize interference; provisions for remote monitoring (deck speaker not included—see MDP-104, page 86) and complete remote control for communications from the bridge; a panel meter indicates relative signal strength and transmitted power output, showing at a glance that your phone is working properly, that you're getting full power; and panel lighting helps night time operation. There aren't even fuses to go out . . . the MWW-15 is circuit breaker protected. Convenient telephone-type handset is included.

BEFORE YOU BUY, CHECK THESE FEATURES . . . compare them with other radiophones on the market. The Heath-Built MWW-15 features individual antenna tuning for 2-5 MHz channels . . . providing more power output across the entire tuning range. It features rust-proof exterior hardware, relays that are sealed against corrosion, and electronic circuitry which has been sprayed against corrosion and tropical fungus. And the compact MWW-15 can be mounted at any angle.

NEVER BEFORE HAVE BOAT OWNERS BEEN OFFERED SUCH A DEPENDABLE, HANDSOME RADIOPHONE. Picture the MWW-15 on the bridge of your boat, or next to the chart table. And you can install this radiophone yourself! The owner's manual is complete in every respect. All FCC regulations, license information, and forms are included. Crystals for 2182 & 2638 kHz are included. All you must do is 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**
- Assembled MWA-15-2 Optional Push-to-talk microphone, 2 lbs. **\$9.95**
- Extra transmit & receive crystals (specify), 1 lb. **\$2.95**

MWW-15 SPECIFICATIONS—RECEIVER: Frequency range: Marine, 2-5 MHz; Broadcast, 540-1620 kHz. Sensitivity: (providing 10 db S/N ratio or better) Marine channels, 2 microvolts; Broadcast, 10 microvolts. Audio output: 3 watts to internal speaker/provision for external speaker; 15 watts to PA "deckcall." 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.

B Heath-Built 75-Watt Marine Radiotelephone

With Unequaled Features And Value Plus Optional Remote Control

- 75 watt power input • 6 Crystal-controlled transmit & receive channels • Covers 2-5 MHz marine band and standard AM broadcast • Remote Control capability with MWA-15-1
- Local-Distance switch • 15-watt amplifier for deck hailing • All-transistor receiver with R.F. stage for extra sensitivity, and ceramic Transfilters® for extra selectivity • Heavy-duty transistor power supply & modulator • FCC type accepted for "party boat" use and DOT approved • Completely assembled & tested

WHAT TO LOOK FOR IN MODERN MARINE ELECTRONICS. Heath innovation has brought new compact size, more dependable solid-state circuitry, higher efficiency and lower current demands to marine electronic equipment. Heath "human engineering" has resulted in a design and layout of controls so that the MWW-14A is easy to operate . . . controls and the panel meter give you a true "feeling" of how the equipment is operating . . . control knobs are "where-they-should-be" for maximum convenience and ease of operating. Plus stainless steel cabinet hardware is employed, the relays are covered for protection, and the circuitry is sprayed against moisture and corrosion. Add these technical benefits to the smart styling, and no doubt you'll agree . . . the MWW-14A is your best buy.

OWNER'S MANUAL IS COMPLETE . . . gives all the information you need, including installation and hints on good operating practices. Includes instructions for tune-up by FCC licensed technician. Compare—you'll choose the MWW-14A.

- Assembled MWW-14A, 31 lbs., no money dn., \$26 mo. **\$279.95**
- Assembled MWW-14AR, 41 lbs. . . 75-watt Radiophone plus Remote Control. . . \$38 dn., as low as \$23 mo. **\$378.95**
- MWA-14-1, Optional Telephone hand set. . . 2 lbs. . . no money dn., \$5 mo. **\$24.95**
- 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. Audio Output: 3 watts to internal speaker/provision for external speaker; 15 watts to PA "deckcall." Transistor Complement: (1) 2N1526 RF amplifier; (4) 2N1525 Marine Crystal Oscillator Mixer, 2nd IF & 3rd IF; (1) T1364 1st IF; (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: 75 watts. RF Output: 40 watts. Transmitter Tube Complement: (1) 12BY7 Colpitts oscillator; (1) 6HF5 power amplifier. Power requirements: 12 volts D. C. Receiver only, 0.6 amp. Standby, 2.9 amp. Transmit 14 amps. Dimensions: 6½" H x 11¼" W x 17" D.



C Complete Remote Control For Heath-Built Radiophones MWW-15 & MWW-14A

- 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

HEATH-BUILT MWA-15-1 REMOTE UNIT . . . COMPACT . . . COMPLETE FACILITIES . . . PERFECT FOR FLYING BRIDGE INSTALLATIONS. Enjoy the convenience and added safety of Fly-Bridge Remote Control. This compact unit provides "on-off" control, volume, & squelch, and full selection of marine channels. Order MWW-15R or MWW-14AR for the Radiotelephone and Remote with all channel switching provisions factory installed . . . both units ready to place in your boat. If you already own a Heath MWW-14A or MWW-15 Radiophone order MWA-15-1 . . . this includes the Remote, all necessary hardware (25' of cable with connectors assembled), plus drive motor for channel switching and instructions for installation in your Heath-Built radiotelephone. Dimensions 5" H x 9" W x 4¾" D.

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

18' Radiophone Antenna

Husky, 2-section, fiberglass antenna. Bottom section 10' long, 1½" diameter; contains loading coil. Top section is 8' whip. Chrome-plated brass studs. Complete with lay-down swivel base & high-impact plastic side-mount, ready to install.

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

24' Marine Antenna

Ideal for use with MWW-15. Husky, 2-section fiberglass. Bottom section 13' long, 1½" dia., contains loading coil. Top, an 11' whip. Complete with lay-down swivel base & side mount. Ready to install.

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



Get Proven Solid-State Reliability With Heath-Built Deluxe Marine Radiotelephones



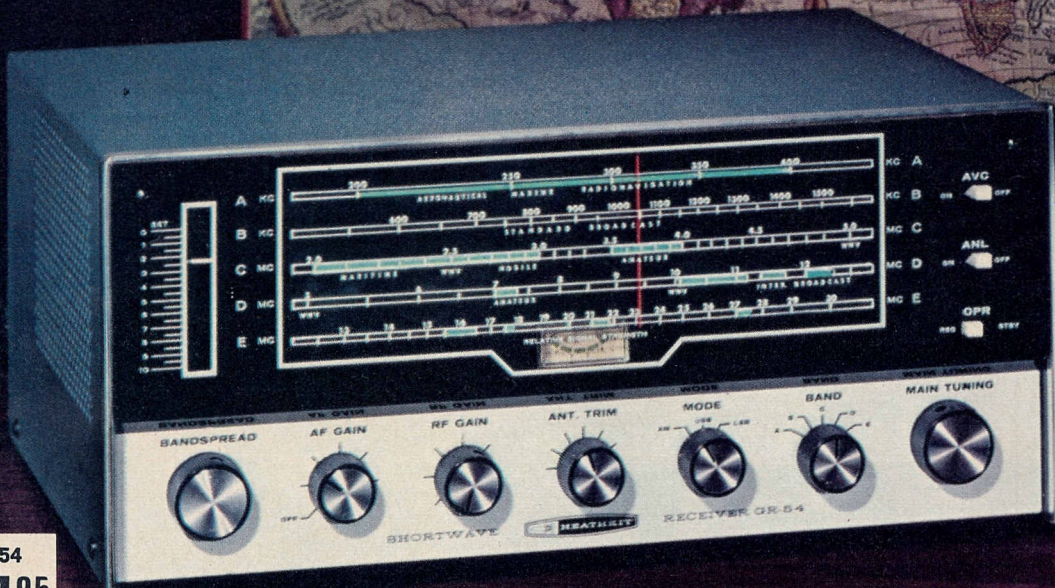
A MWW-15
\$375⁰⁰



C MWA-15-1
\$99⁰⁰



B MWW-14A
\$279⁹⁵



GR-54
\$84⁹⁵

Enjoy A Low Cost World Cruise...

Deluxe 5-Band Shortwave Receiver . . . Compares To Sets Costing \$150 . . . Includes FREE SWL Antenna

SHORTWAVE RECEPTION GUIDE

BAND	FREQUENCY	TIME	ZONE
80 M	3.5 MHz	All day	U.S. Amateur & Marine
49 M	6 MHz	Evening	Latin America and Europe
40 M	7 MHz	Late afternoon, Evening	Europe
40 M	7 MHz	Morning	U. S. Amateur
31 M	9 MHz	Morning	Asia and Australia
31 M	9 MHz	Afternoon	Europe and Africa
31 M	9 MHz	Evening	Europe and Latin America
25 M	11 MHz	Morning	Asia and Australia
25 M	11 MHz	Evening	Latin America
20 M	14 MHz	Late morning, Afternoon	U.S. & Foreign, Amateur
19 M	15 MHz	Late morning, Afternoon	Europe and North America
19 M	15 MHz	Evening	North and Latin America
16 M	17 MHz	Afternoon	Europe
16 M	17 MHz	All day	U.S.
16 M	17 MHz	Evening	South America
13 M	20 MHz	Afternoon	Europe
13 M	20 MHz	All day	U.S.
13 M	20 MHz	Evening	South America
11 M	27 MHz	All day	Local Citizen's Band
10 M	28 MHz	Morning	Europe
10 M	28 MHz	All day	Central America & U.S. Amateur
		Evening	Asia

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

• 5 bands . . . 3 shortwave bands 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 • Half lattice 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

A Host Of Deluxe Features! Like those usually found only on more expensive receivers . . . and that will be especially appreciated by the seasoned SWL. Features like the tuned RF stage for added amplification and image rejection . . . a crystal filter for razor-sharp selectivity (you won't find this feature on any assembly unit selling for less than \$150) . . . a diode detector for AM, plus a separate product detector for efficient SSB and CW listening. You'll also like the convenience of the switchable BFO control. Simply switch to upper sideband (USB) or lower sideband (LSB) positions, and adjust the bandspread tuning control . . . eliminates "trial and error" SSB tuning. And for a new adventure in listening, try the aeronautical weather broadcasts on the extra 180 kHz to 420 kHz band.

Have Ambitions Toward Amateur Radio? Then develop your keying proficiency 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 hear your keying through the built-in 4" x 6" speaker.

Controls For All Functions. There are separate level controls for audio volume and RF amplifier gain, an antenna trimmer for peak reception, band selector switch, bandspread tuning, mode selector, main tuning, automatic noise limiter, and an automatic volume control to nullify blasting or fading while tuning.

How Can We Offer This Unit At Such a Low Price? Typical Heath "do-it-yourself" savings plus low factory-to-you costs, of course. But we've gone a step further. With the GR-54 you build and align the "front-end" tuner . . . with or *without* instruments . . . and get factory-built results! Thanks to a unique band-switch assembly, you simply align the coils with the alignment tool provided, and use the signal strength meter for adjustment readings. Entire assembly time takes around 12 to 15 hours.

As for looks, judge for yourself. It would make a handsome addition to your den or living room.

Kit GR-54, 25 lbs. . . no money dn., \$9 mo. \$84.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

GR-54 SPECIFICATIONS—Frequency Coverage: Band A 180 kHz to 420 kHz; Band B 550 kHz to 1550 kHz; Band C 2 MHz to 5 MHz; Band D 5 MHz to 12.5 MHz; Band E 12.5 MHz to 30 MHz. **Sensitivity:** AM: Band A 1.6 uv; Band B 8 uv; Band C 1 uv; Band D 1.2 uv; Band E 6 uv. SSB/CW: Band A 0.7 uv; Band C 0.4 uv; Band D 0.5 uv; Band E 4 uv. Signal Level for 10 db, signal plus noise to noise ratio. **Selectivity:** Crystal filter; 3 kHz minimum at -6 db; 7.5 kHz maximum at -20 db. **Intermediate frequency:** 1682 kHz. **Antenna Input impedance:** 50 ohms nominal—phone connector. **Power requirements:** 120 volts 50/60 Hz AC, 45 watts. **Controls:** Bandspread, AF Gain/off-on switch; RF Gain; Ant. trim; Mode switch; Band switch; Main tuning; AVC switch; ANL switch; OPR switch; Meter adjust. **Audio output impedance:** 8 ohms nominal. **Meter:** Indicates relative signal strength. **Speaker:** Built-in 4" x 6" permanent magnet. **Standard jack:** Accepts 8 ohm ext. speaker, or headphones (50 ohm to 10 K ohm). **Dimensions:** 14 1/8" W x 6-5/16" H x 10-15/16" D.

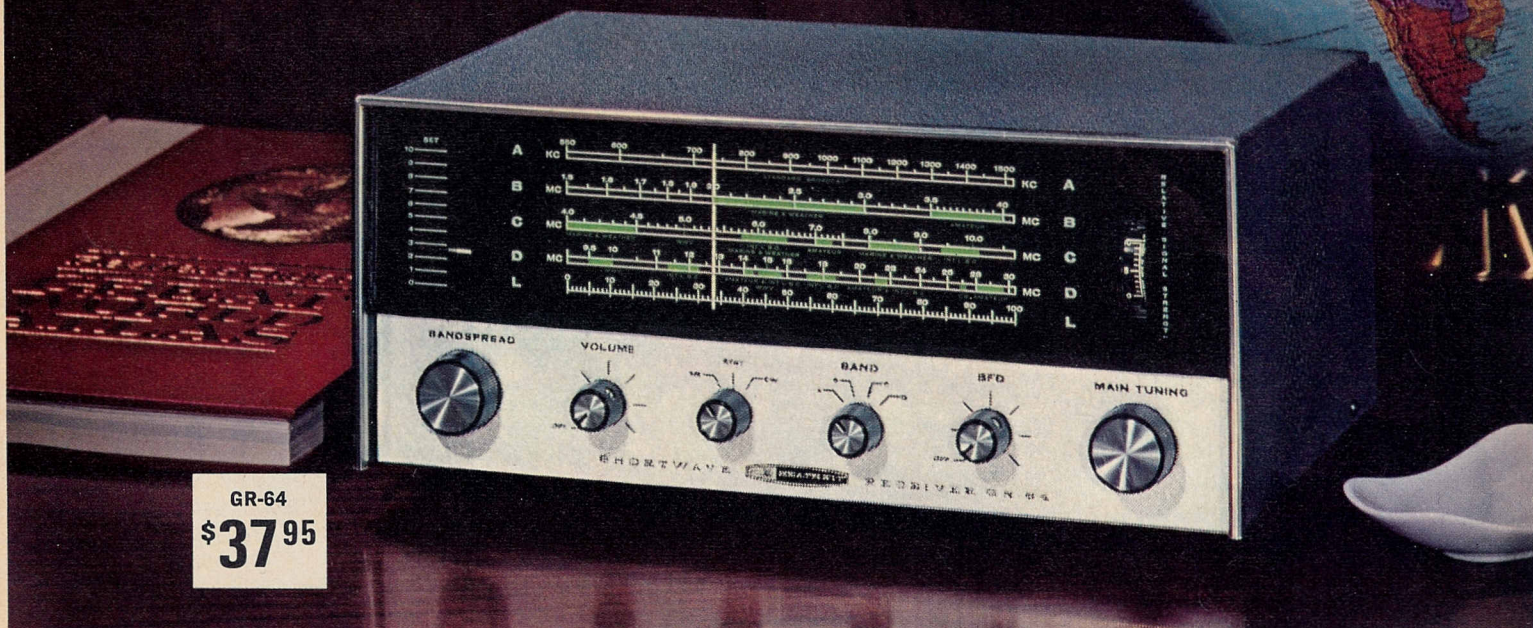
Superex Shortwave Headphones

For DX-ing, Private Listening! Use with all Heathkit shortwave (except GR-43) and amateur radio receivers. Features single lead convenience, vinyl-clad headband (1 1/8" wide), dual coils, Alnico V magnets, 2000 ohm impedance. Not a kit.

GD-396, 1 lb. \$3.50



GD-396
\$3.50



GR-64
\$37.95

On A Heathkit® Shortwave Radio



Explore The Intrigue And Drama Of Shortwave With This 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 & SSB 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

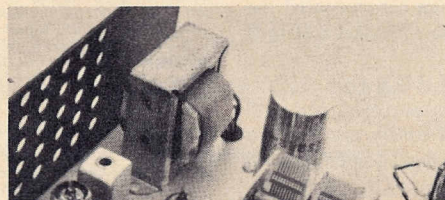
Widen Your Listening Horizons. Let your imagination roam with the intrigue of shortwave radio. Thrill to the somber tones of Big Ben in London . . . or wonder at the machine-gun pace of a CW operator sending an urgent code message . . . or enjoy live broadcasts from Japan, Australia, Peru, Holland, Brazil—hundreds of foreign countries. Pick up the Voice of America, Radio Moscow . . . tune in ham operators, the buzzing drone of Coast Guard LORAN stations, ship-to-shore broadcasts and weather reports. Even get the exact time from government station WWV in Washington D.C. Then come home again, and enjoy local news, weather and sports on popular AM band. Hear it all . . . and much more . . . on this one, low cost receiver.

Advanced Features. A high voltage, transformer-operated power supply insures peak receiver efficiency. A BFO control "unscrambles" code and SSB 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.

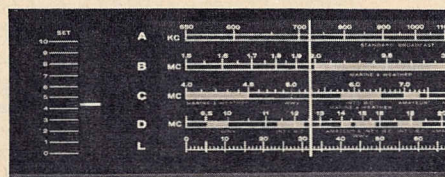
Modern "Low-Boy" Styling. Includes a charcoal gray metal cabinet with black front panel and green and white band markings . . . makes a handsome addition to any room. And with easy circuit board assembly, construction takes about 8 to 10 hours.

Kit GR-64, 15 lbs.
No money down, \$5 mo. \$37.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

GR-64 SPECIFICATIONS—Frequency range: 550 kHz to 30 MHz in four bands. **Controls:** General coverage tuning, Bandspread tuning, Bandswitch, Noise Limiter—ON/OFF, Phone-Standby-CW switch, BFO control, Audio Gain, AC-ON/OFF, Headphone jack, Q-multiplier input. **Power requirements:** 105-125 V 50/60 Hz AC, 30 watts. **Dimensions:** 13½" W x 6" H x 9" D.

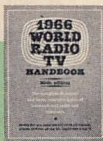


High Voltage, Transformer-Operated Power Supply. Provides peak receiver efficiency, safe "shock-free" operation.



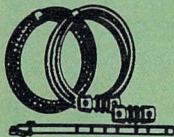
Lighted Bandspread And Dial Calibration . . . 7" slide-rule dial covers 550 kHz to 30 MHz in four bands. Bandspread tuning helps pinpoint frequencies.

SWL Station Guide



Latest World Radio TV Handbook! Lists AM, FM, TV and Shortwave stations . . . includes call signs, frequencies, transmitter power, address for QSL cards, program details, broadcast times, etc. 300 pages. GDP-315, 2 lbs. \$4.95

Long-Wire Shortwave Antenna



Includes 75' Long-Wire Antenna, 30' lead-in wire, porcelain insulators and grounding hardware with complete instructions. Use with any shortwave receiver. Included FREE with GR-54. GRA-72, 2 lbs. \$1.45

GD-125
\$14.95



Improve Shortwave Reception with a "Q" Multiplier!

Compact "Low-Boy" Styling! Attractive charcoal cabinet with gray front panel . . . matches GR-64 SWL receiver (above). Ideal for use with GR-64 or similar receivers with IF circuits from 450 to 460 kHz. Creates extra-sharp selectivity through an effective "Q" of 4000, and provides a notch for adjacent signal attenuation. Includes built-in power supply.

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



HOME ENTERTAINMENT

Tour The Voice Capitals Of The World



GR-43
\$159⁹⁵

Deluxe 10-Band AM/FM/Shortwave Transistor Portable . . . 44 Factory-Built & Aligned RF Circuits Plus Separate AM & FM IF Sections To Assure You The Finest In Portable Listening

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

Your Passport To Unsurpassed Global Listening is always ready when you take along this deluxe 10-band portable. "Visit" ships at sea, amateur radio operators and hundreds of foreign stations via the 7 shortwave bands. Or drop in on aircraft beacon and marine weather transmissions with 150-400 kHz longwave. And to keep posted on the latest local happenings, there's the 550-1600 kHz AM band . . . has a tuning sharpness that receives stations you've never heard before! For a unique and delightful experience in portable FM listening, we've incorporated the same FM tuner and IF strip that are used in Deluxe Heathkit FM hi-fi components.

16 Transistors, 6 Diodes, 44 Factory-Built & Aligned RF Circuits . . . your assurance of instant, heat-free operation; top performance; and easy 10-hour assembly. Two separate AM and FM tuners are factory-built, ready to mount into place . . . eliminates the need for alignment, insures best performance, and speeds assembly.

Two Built-In Antennas . . . a large ferrite rod neatly housed in the easy-carry handle for AM and Longwave, and a 5' telescoping whip that tilts for best FM and shortwave reception. Also has connectors for external antennas.

Versatile Controls Offer Convenience. A Battery-Saver switch reduces battery drain up to 35% for normal indoor listening, or provides a healthy 500 milliwatts for easy listening outdoors. A 10-position selector drives the rotating turret dial . . . permits easy viewing of any band. There's even a logging scale to help relocate unknown frequencies. In addition, there's Dial Light for nighttime use; AFC with on-off switch for drift-free FM; an 8½ revolution tuning knob easily separates stations; and a combination on-off switch and tone control for listening as you like it.

Large 4" x 6" PM Speaker . . . designed to match cabinet acoustics . . . provides "big-set" sound. Also includes an earphone that plugs into a built-in jack for private listening.

Inexpensive Flashlight Battery Power. 6 "D" batteries available anywhere power the radio, and 1 "C" battery operates the dial light (batteries not included). Also works on 117 v. AC as it "float" charges its batteries with an optional converter/charger (see below).

Deluxe Styling Matches Deluxe Performance. Jet black extruded aluminum front and back panels contrast beautifully with the chrome-plated, die-cast end pieces. Both panels are hinged . . . open and close easily thanks to special magnetic latches. The front panel can be removed to take less space when used at home. Includes "Listener's Guide" with frequencies of worldwide shortwave and U. S. FM stations . . . plus a special map for easy conversion of world time zones.

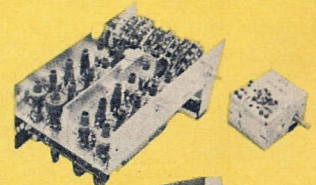
Kit GR-43, 19 lbs. . . no money dn., \$15 mo. **\$159.95**
Model GRA-43-1, Converter/Charger for 117 v. AC, 1 lb. **\$6.95**

GR-43 SPECIFICATIONS—AM SECTION: Tuning range: Long wave—150-400 kHz; Broadcast—550-1600 kHz; 2-4 MHz—2.4 MHz; 4-9 MHz—4.9 MHz; 31 M—9.2-10.2 MHz; 25 M—11.2-12.4 MHz; 19 M—14.5-16.1 MHz; 16 M—16.8-18.8 MHz; 13 M—20.2-22.5 MHz. **Sensitivity:** at External Antenna Input for a 10 db signal-plus-noise to noise ratio. Long Wave—12 uv; Broadcast—10 uv; 2-4 MHz—5 uv; 4-9 MHz—3 uv; 31 M—3 uv; 25 M—2 uv; 19 M—2 uv; 16 M—2 uv; 13 M—2 uv. **Intermediate frequency (IF):** 455 kHz. **FM SECTION: Tuning range:** 88-108 MHz. **Sensitivity:** 1½ uv for 20 db of quieting; 2 uv for 30 db of quieting; 3 uv for 40 db of quieting. **Intermediate frequency (IF):** 10.7 MHz. **GENERAL: Audio output:** Normal: 500 mw; Battery Saver: 160 mw. **Speaker:** 4" x 6" oval; permanent magnet; 3.2 ohm voice coil impedance. **Batteries:** 6—size D cells; 1—size C cell. **Dimensions:** 13½" W x 5½" D x 10¾" H, including handle.

Optional Charger/Converter . . . to operate on 117 v. AC. Plugs into built-in jack to "float-charge" batteries while you enjoy good listening without battery drain. Priced at only \$6.95.



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



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



With A Heathkit® Shortwave Portable



Rugged And Ready To Go Anywhere . . . Deluxe Heathkit "Mohican" 5-Band Shortwave Portable

• Powerful 10 transistor, 6-diode circuit • Tunes 550 kHz to 32 MHz in five bands • Fixed-aligned ceramic IF "transfilters®" for best selectivity • Completely self-contained for portability, yet can operate on 117 V. AC with XP-2 accessory below

Wherever You Go, The "Mohican" Is A Welcome Traveler! With its all-transistor circuit, self-contained flashlight battery power supply, handy carrying handle, and compact styling, the "Mohican" offers "fuss-free" portability at the beach, ball game, picnic, on a boat or camping expedition. Simply pull out its built-in 50-inch telescopic whip antenna, switch it on, and tune any of its five bands to find out the latest world happenings . . . keep abreast of traffic and weather conditions . . . pick up amateur radio operators . . . or be entertained with popular music.

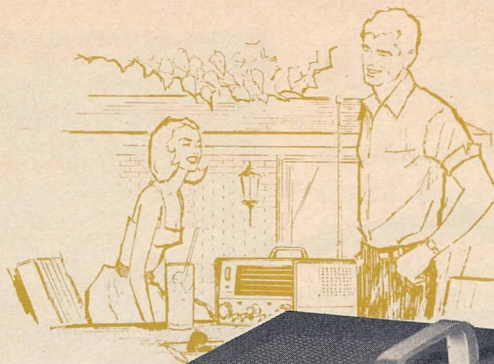
Many Deluxe Operating Conveniences have been "Heath-Engineered" into this superb unit. For example, the fixed-aligned ceramic IF "Trans-filters®", primarily designed for military use, shape the IF bandpass for excellent stability and selectivity . . . the reliable 10-transistor, 6-diode circuit for instant operation and long trouble-free performance . . . Zener diode voltage regulation . . . smooth, flywheel tuning . . . panel meter for pin-point tuning . . . built-in 4" x 6" speaker for crisp, bold sound . . . a headphone jack for private listening and "DX-ing" . . . and a large, slide-rule dial for easy station selection.

Complete Front Panel Controls . . . on /off volume control, BFO pitch with on/off switch, RF gain, antenna tuning, electrical bandspread, ANL on/off, AVC on/off and band switch . . . offer finger-tip convenience. Operates on 8 "C" flashlight batteries (not included), or on household 117 v. AC with optional XP-2 power supply (see opposite).

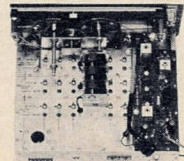
Designer Styling. Attractive 2-tone green metal cabinet makes a handsome companion . . . withstands rough handling. Takes around 30 hours to build . . . requires RF generator for final alignment. Also serves as a backup receiver for amateur radio operators. For all-around reception in a deluxe unit at an economy price, choose the "Mohican".

Kit GC-1A, 18 lbs. . . no money dn., \$9 mo. \$89.50
Kit XP-2, 117 v. AC plug-in power supply, 2 lbs. \$9.95

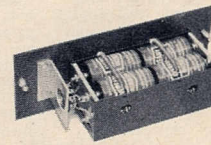
GC-1A SPECIFICATIONS—IF Frequency: 455 kHz. Frequency coverage: 550 kHz to 32 MHz in 5 bands with calibrated bandspread scales (oscillator tuning) for 80, 40, 20, 15 and 10 meter amateur bands and 11 meter citizens band. Selectivity: 3 kHz wide at 6 db down. Sensitivity: 10 uv broadcast band, 2 uv shortwave bands for 10 db signal-to-noise ratio. Output: 400 milliwatts max. Battery life: Up to 400 hours normal intermittent service using 8 standard size "C" cells. Dimensions: 6 7/8" H x 12" W x 10" D.



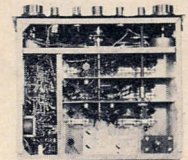
GC-1A
\$89⁵⁰



10 TRANSISTORS, 6 DIODES . . . no hybrid circuits here, this world-circling receiver has an all semi-conductor circuit.

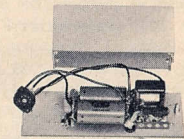


BATTERY POWERED FOR PORTABILITY Uses 8 standard flashlight batteries to make it independent of power lines; use in anywhere . . . it works everywhere.



CERAMIC IF "TRANS-FILTERS®" developed for military use, shape bandpass, offer superior selectivity, never need alignment.

Kit XP-2, handy 117 v. AC power supply, plugs into back of set whenever you are near a power line to save batteries. 2 lbs. \$9.95



Our Lowest Cost Shortwave Radio . . . Ideal For "Beginner" Kit-Builders Or "Young" SWL's

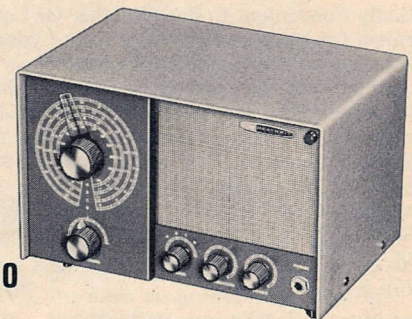
• Covers 140 kHz to 18 MHz in 4 bands • Transformer operated for safety • Built-in speaker & headphone jack • Easy to assemble . . . takes around 6 hours

What A Thrill You Get When You Tune The Vast Array of global broadcasts on this compact economy performer! Covers 140 kHz to 18 MHz to bring you international shortwave stations . . . 160, 80, 40 and 20 meter amateur bands . . . low frequency marine and aircraft stations . . . weather and distress messages . . . government stations . . . popular AM stations! Its simple 3-tube sensitive regenerative circuit goes together in just 6 fun-filled hours, yet offers years of "around-the-globe" listening! And its low price makes it ideal for youngsters and novices with a yen to try shortwave listening!

Included In This Attractive Entertainer are provisions for long and short antennas, "shock-free" transformer operated power supply, built-in weatherproof speaker, "private" headphone jack, "fine-tune" front panel-mounted controls, and a sturdy green and beige metal cabinet.

Open New Horizons Of Listening Pleasure, by exploring the wide world of Shortwave Radio—without over-extending that hard-earned budget!

Kit GR-81, 12 lbs. \$23.50



GR-81
\$23⁵⁰

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 AC 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.



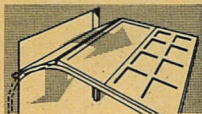
AUTOMOTIVE

Add Greater Convenience And Economy To

GD-20A
\$124⁹⁰



**Open And Close Your Garage Door
From The Comfort And Safety Of Your Car . . .
With This "Radio-Controlled" Semi-Kit**



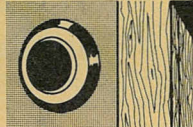
Universal Mechanism
Motor and mechanism will operate overhead and most jamb or pivot type residential garage doors . . . sizes up to 8' high! Requires just 2 1/2" clearance above highest point of door travel.



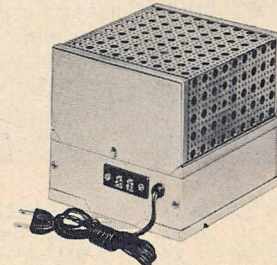
"Pocket-Size" Portable VHF Transmitter
No wires, battery powered . . . fits into purse or pocket, clips to sun visor. No permanent installation required . . . easy to move from car to car. Provides greater operating range . . . no CB interference.



Sensitive, Superregenerative VHF Receiver!
Takes just a few minutes to install in your garage! . . . operates on 230 to 290 megacycles . . . requires no license. Selectable tone coding prevents interference with similar neighborhood units.



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.



Assembled Transmitter & Receiver

Kit Form Mechanism



• New VHF portable "wireless" transmitter—so compact it fits in pocket & purse, or attach to car's sun visor • No car battery drain • No permanent under-hood installation • New VHF receiver—installs in your garage in mere minutes • Operates at greater ranges—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 • Automatically turns on garage light when door is opened • Just assemble mechanism—transmitter & receiver are completely assembled, ready to use • No FCC license required—complies with FCC regulations • 2-year warranty on receiver & transmitter • Operates well within new FCC radiation limits . . . won't interfere with aircraft radio frequencies

Especially Convenient In Bad Weather Or Late At Night . . . especially convenient for Mom or elder members of your household! Just a touch of the button on the "wireless" transmitter as you pull into your driveway, and 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 straining and struggling with that heavy awkward door . . . no more groping around in the dark at night trying to find the garage light . . . no more dashing from your car to the garage and back when it's cold, raining or snowing.

A time delay on the mechanism-operated light allows you plenty of time to enter your house, or switch on the main lights . . . what could be more safe or simple.

Transmitter And Receiver Prebuilt . . . You Assemble Only The Mechanism! The "pocket-size" transmitter offers portable convenience . . . simply clip to car's sun visor, or store in the glove compartment, your pocket or purse. And since it's "wireless", there's no complicated or cumbersome permanent mounting under the hood or dash . . . makes it easy to use from car to car! Operates on self-contained battery power to eliminate any drain on car's battery.

And the sensitive superregenerative receiver with RF stage takes just a few minutes to install in your garage. No license is required . . . system is designed for use on 230 to 290 megacycles. And selectable tone coding prevents interference with similar neighborhood units.

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 independently adjustable in both "up" and "down" directions. The mechanism is quick and easy to assemble . . . also 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. The automatic light feature may be extended to control driveway, patio, breezeway lights, etc.

Start enjoying the convenience and labor-saving ease of a Heathkit Garage Door Opener . . . order yours now!

- GD-20A**, 69 lbs. (REA Express or Motor Frt. only), mechanism, (1) transmitter, (1) receiver . . . no money down, \$12 mo. . . . **\$124.90**
- GD-20B**, 69 lbs. (REA Express or Motor Frt. only), mechanism, (2) transmitters, (1) receiver . . . no money down, \$14 mo. . . . **\$144.90**
- Kit GDA-20-3**, Heathkit mechanism, 61 lbs. (REA Express or Motor Frt. only) . . . no money down, \$7 mo. . . . **\$69.95**
- GDA-20-4**, (1) Transmitter, (1) Receiver . . . 8 lbs. . . . no money dn., \$6 mo. . . . **\$54.95**
- GDA-20-5**, (2) Transmitters, (1) Receiver . . . 8 lbs. . . . no money dn., \$8 mo. . . . **\$74.95**

KIT MECHANISM SPECIFICATIONS—125" long x 8 3/4" high x 13" wide. 100# max. operating force. Operates overhead track and most jamb & pivot doors up to 8' high. 117 V. AC. 1/4 H.P. motor. Fused.

VHF TRANSMITTER SPECIFICATIONS—Powered by two Eveready #E-91 alkaline batteries. Uses one of six modulation frequencies approx. 16 kHz, 18 kHz, 20 kHz, 22 kHz, 24 kHz, 26 kHz, CK 5676 RF osc. tube, 2N270 audio osc. transistor. 5 1/2" H x 3" W x 1 3/4" D.

VHF RECEIVER SPECIFICATIONS—117 VAC, 10 watts. 6AB4 RF amplifier, 12AT7 detector-amplifier, 12AT7 amplifier-rectifier, 5696 relay control. RF frequencies approx. 225 MHz, 230 MHz, 235 MHz, 250 MHz, 255 MHz, 290 MHz, 295 MHz. 5 3/4" H x 6" W x 6 1/2" D.

Your Driving With A Heathkit® Auto Accessory



Heathkit Auto Ignition Analyzer . . . Quick And Easy Way To Diagnose Ignition Troubles

- 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

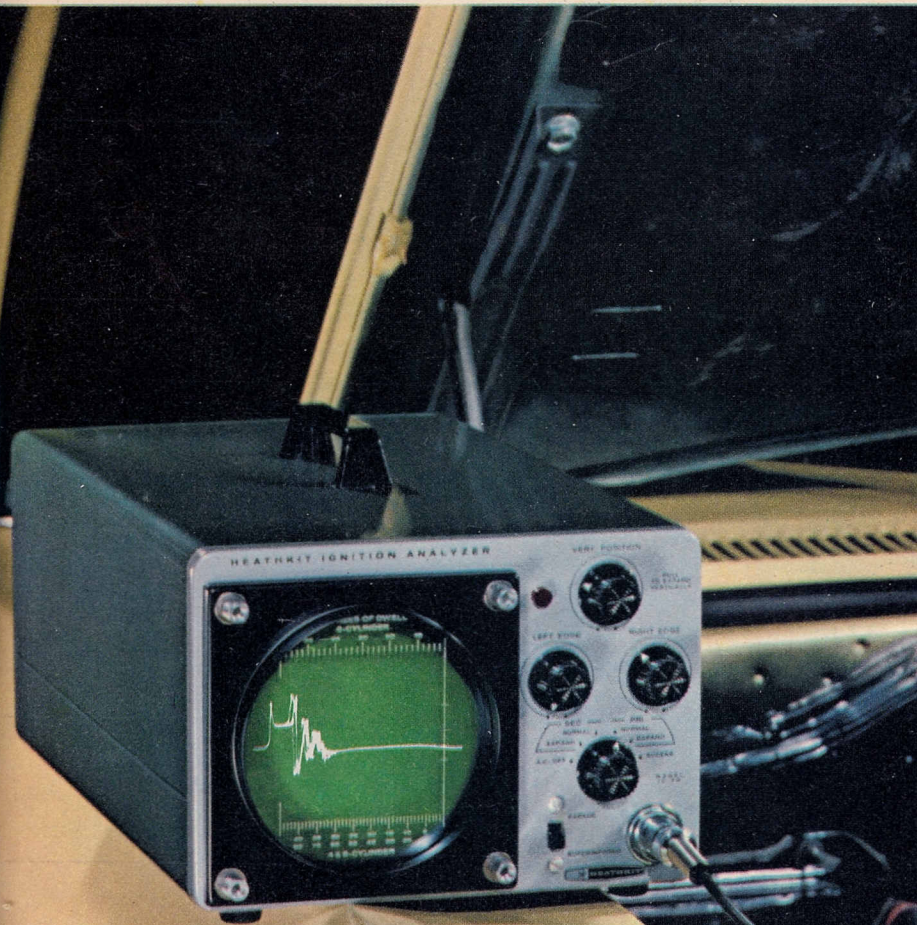
Ideal For Car Enthusiasts, Service Stations. Helps keep your car running smoothly . . . identifies common faults like shorted spark plugs, bad points, defective wiring, worn distributor parts, incorrect dwell time, coil and condenser problems, plus many more engine defects. Use it in the shop with its own built-in power supply, or "on-the-road" with an external DC to AC inverter.

Select 4 Different Patterns Without Switching Leads. A special switching system provides instant selection of primary and secondary patterns in either parade or super-imposed displays without the bother of lead switching. Expand the views for detailed analysis . . . 10 to 1 horizontally or 2 to 1 vertically. The trigger circuit provides the steady "locked-in" pattern display you need for convenience.

Easy To Build . . . Rugged Metal Housing. Goes together quickly, simply . . . no special skills or knowledge needed. And you enjoy the extra "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.

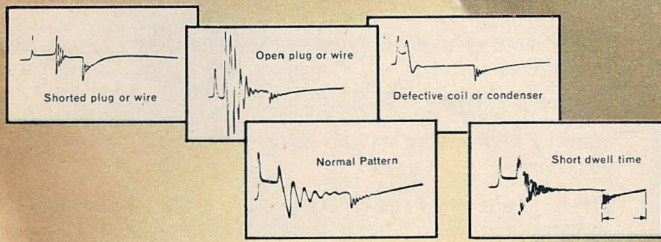
Kit IO-20, 17 lbs. . . No money down, \$9 mo. . . \$89.95
Export model available for 115/230 VAC, 50-60 Hz; write for prices.

IO-20 SPECIFICATIONS—Rpm Range: 400-5000 rpm. Displays: Secondary, Primary, Parade, Super-imposed. Screen size: 4½" diameter. Dwell measurement: 4, 6 & 8 cylinder calibration on face plate. Pattern height: Secondary circuit, approx. 1" Primary circuit, 6 volt system ¾", 12 volt system 1". Vertical expand ratio: 2 to 1. Horizontal expand ratio: 10 to 1. Cable length: 12' pick-up clamp, 2' ground, primary and secondary clips. Power requirements: 105-125 V, 50/60 Hz AC, 30 watts.



IO-20
\$89.95

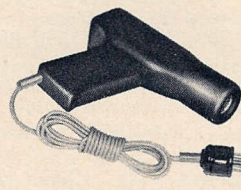
Tell-tale Patterns Show Ignition System Condition



It's Easy To Tune-Up And Repair Your Car's Engine With This GILBERT-DAVIS 4-Unit Basic Tester Set

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
\$14.95

Timing Light Kit . . . Accessory To Heathkit IO-20 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-lit 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.

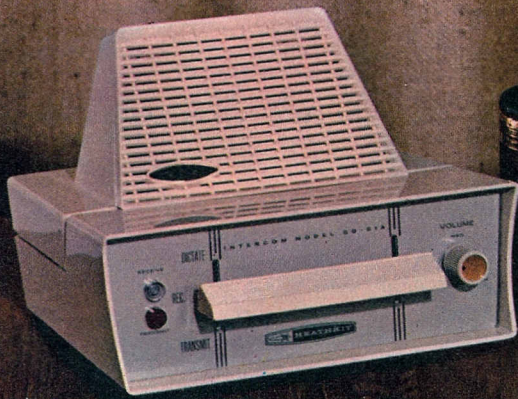
Kit ID-11, 3 lbs. \$14.95

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



HOME
ENTERTAINMENT

Lighten Daily Chores With



GD-51A
\$22⁹⁵



GD-121
Master
Station
\$29⁹⁵

GD-131
Indoor
Remote
\$8⁹⁵

Save Time, Steps And Your Voice . . . With A Heathkit Transistor "Wireless" Intercom

- No connecting wires between units . . . just plug into nearest AC or DC outlet, and you're ready for instant communications
- All-transistor circuit—built-in AC power supply • Switch-selected choice of 2 operating frequencies • Compact—fits almost anywhere
- Add as many units as you wish anytime • Economical—costs less than 3c a month to operate • Attractive 2-tone beige plastic cabinets . . . match any decor • Variable squelch to hush background noise

Use Any Number Of Units Anywhere . . . kitchen, bedroom, den, garage, basement . . . as long as they operate on the *same* power line. No need for batteries . . . operates from any 117 v. AC receptacle. Easy to use . . . just plug it in, push the large press-to-talk bar release to listen . . . that's all there is to it. Provides instant two-way communications between you and other family members. Eliminates annoying shouting . . . saves valuable time and steps.

A Competent Baby-Sitter . . . Ideal For Dictation. The press-to-talk bar has a spring-return to listen, and a "dictate" hold position for keeping tabs on the baby, or for predominately one-way transmissions. Think of the precious steps and minutes you can save with a pair of these work-savers at the office.

A Host Of Operating Conveniences. Like the all-transistor circuit for instant operation and long, trouble-free life . . . a variable squelch to screen out background noises during standby periods . . . and two indicator lights, red for transmit, amber for receive. Easy to build with point-to-point wiring and simple step-by-step instructions. Modern plastic cabinets are styled in 2-tone beige to blend with any decor.

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.

Provides An Extra Measure Of Household Security . . . Transistor 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

Now Identify Callers Before Opening The Door . . . with this versatile Indoor-Outdoor intercom system in your house. Simply converse with any visitor through the outdoor remote unit. Adds to your personal safety . . . especially late at night, or when you're alone! And you can place up to 5 remote stations anywhere around the house to save time and steps.

Private Calls Or Paging. Master unit features selective and all-call switches for private inter-unit communications, or paging entire remote group. Also has all-transistor circuitry for instant operation without warm-up . . . built-in power supply . . . separate listen and talk volume controls . . . and attractive beige plastic cabinets.

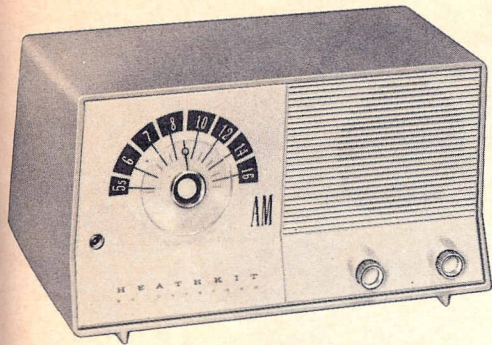
Any Two Remotes Can Communicate . . . thanks to the inter-remote feature. In the "monitor" position, the remote can be switched by the master unit, so it can be heard by other remotes anywhere in the house. Ideal for babysitting! Each remote unit has a 3-position listen-talk-monitor switch, 50' of 3-conductor wire, and matching beige plastic cabinet.

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 bs. \$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), 5¼" x 4½" panel size (outdoor remote).

These Heathkit® Work-Savers!



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

• Vernier tuning for smooth easy station selection • Safe transformer isolated power supply • Handsomely styled in beige and ivory plastic • Assembles in just 4 to 6 hours

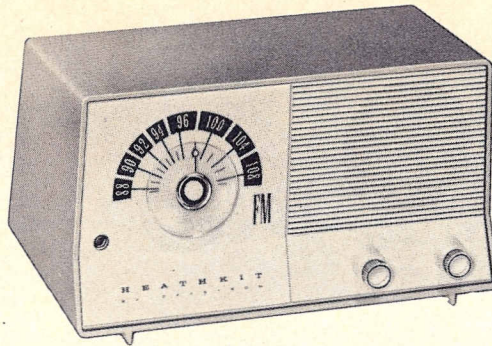
NEED A RADIO FOR THE KITCHEN? Or the bedroom? Or possibly that extra room you just remodeled? With the GR-10, you can enjoy popular AM listening in any room at low cost. Its sleek beige and muted ivory plastic cabinet enhances any surroundings. And its modern superhet circuit has the sensitivity and selectivity to provide beautifully clear reception.

Features vernier tuning for easy, accurate station selection . . . high quality ferrite rod antenna for strong local reception . . . terminals for an external antenna to pull in far distant stations . . . a neon on-off indicator light . . . and safe transformer power operation.

Easy to build, too. You'll have it plugged in and playing after 4 to 6 enjoyable kit-building hours.

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.



Enjoy The Quiet Beauty Of FM Low Cost Table Radio

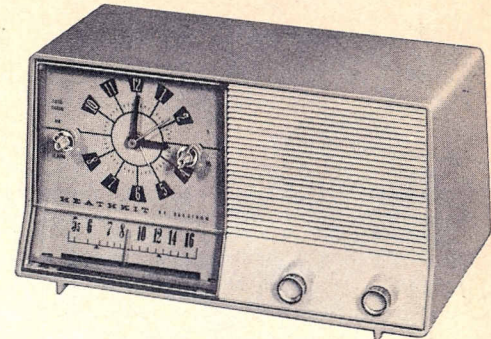
• Preassembled, prealigned FM tuning unit for easy assembly • Vernier tuning for easy, accurate station selection • Transformer isolated power supply for safety • Decorator-design plastic cabinet in beige & ivory

TIRED OF THE USUAL RADIO FARE? Then enjoy the crystal-clear fidelity and good listening of FM with the GR-11. Its low price puts it easily within any budget, yet its quality compares to models costing far more. You'll like its compact styling and attractive looks, too.

Boasts a five tube circuit that performs like seven . . . smooth precise vernier tuning . . . built-in line cord antenna for local station pickup . . . separate terminals for an external FM antenna . . . neon on-off indicator light . . . safe transformer-isolated power supply . . . and decorator-designed beige & ivory plastic cabinet. Takes only around 5 hours to build with simple step-by-step instructions and factory assembled and aligned tuning coils.

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 3/4" H x 10" W x 5 1/2" D.



Wake Up In A Happy Mood . . . Versatile AM Clock Radio

• Timer outlet for household appliances • Sleep switch—radio alarm—pillow speaker jack • Transformer isolated power supply for safety • Attractive modern cabinet styling

STARTS YOUR DAY ON THE BRIGHT SIDE. Gently wakes you with music . . . no more rude buzzes or clangs. If you're a "heavy" sleeper, an alarm sounds 10 minutes later to insure "wake-up." Meanwhile the clock/timer automatically starts your morning coffee. Entertains you throughout the day, then lulls you to sleep again at night. Even has a pillow speaker jack for private listening.

Automatically turns itself off at any preset interval up to an hour. Features a built-in ferrite rod antenna for strong local reception; sweep-second hand on the clock/timer unit; handsome ivory and beige plastic cabinet. Assembles in 4 to 6 hours . . . no special skills, knowledge or tools needed.

Kit GR-121, 8 lbs. . . no money dn., \$5 mo. . \$28.25

GR-121 SPECIFICATIONS—Circuit: 5-tube superheterodyne. Frequency coverage: 535-1620 kHz. IF frequency: 455 kHz. Power supply: 115 v., 60 Hz, AC only. Speaker: 3" PM. Controls: On/off volume, tuning, "Sleep Switch," "Radio Alarm." Dimensions: 5-13/16" H x 10-1/16" W x 5 3/8" D.

Tools For Kit Building



A Add Longer Life To Drills, Bits And Blades With A Heathkit Motor Speed Control
 • 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

B "Little Dandy" Soldering Iron . . . Ideal for Kit-Building
 • Perfectly balanced, lightweight, easy to handle • Reaches working temperature 2 minutes after plug-in, stays hot • 30-watt heating element • Iron-clad tip won't corrode, doesn't require frequent "tinning"
 Model GDP-105, 1 lb. \$5.40

C SPEEDEX Wire & Cable Stripper Model 766-1 . . . Save \$4.06!
 • Simple to use—insert wire into jaws, squeeze handle and insulation comes off instantly • Graduated jaws accept No. 10, 12, 14, 16, and 22 wire
 Model GDP-663, 2 lbs. . . Mfrs. list \$9.95 . . . Only \$5.89

D New Deluxe Tool Set . . . Use For Kit-Building Or Any Fix-It Job!
 • Combination wire stripper & diagonal sidecutter • Midget longnose pliers; 3 screwdrivers (3/32", 1/8", 3/16") • "Little Dandy" soldering iron (above) • 5 nut drivers (3/16", 1/4", 5/16", 3/8", 1/2") • Nut starter, soldering aid, radio solder, and "Kit-Builder's Guide" with soldering instructions
 Model GH-25, 4 lbs. \$16.95

E Heathkit Soldering Iron Kit . . . Ideal For Kit-Building
 • Lightweight, easy-to-handle . . . ideal for kit-building or any "tight" soldering job • 6 volt, 25-watt GE midget iron with non-corroding tip that doesn't require frequent "tinning" • Transformer-operated power supply offers selection of 8 heat ranges • Excellent heat recovery time • Protective metal cage
 Kit GH-52, 5 lbs. \$14.95

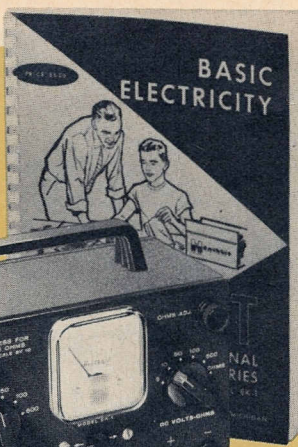
F Vaco Hollow Shaft Nut Driver Set . . . Time Saver!
 • 7 drivers—sizes: 3/16", 1/4", 5/16", 11/32", 3/8", 7/16", 1/2" • Hollow shafts for nut installation on switches, controls • Store in self supporting metal rack
 • Tough, color-coded plastic handles
 Model GDP-204, 3 lbs. \$6.42



EDUCATIONAL

Explore The Exciting World Of Electronics

A EK-1
\$19⁹⁵

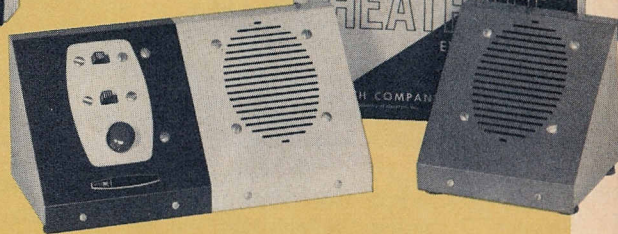


C EK-3
\$16⁹⁵

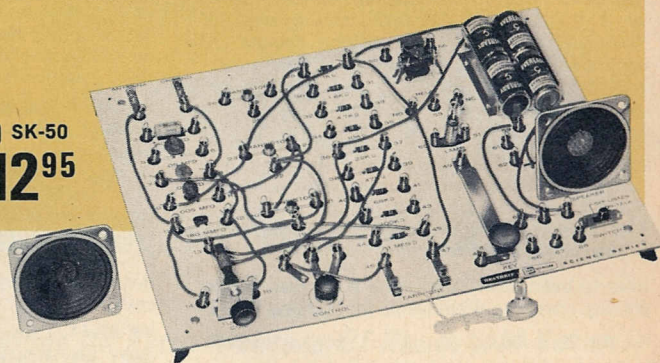


B EK-2A
\$18⁷⁵

(less cabinet)



D SK-50
\$12⁹⁵



A Basic Electricity Kit

AN IDEAL INTRODUCTION TO ELECTRONICS . . . teaches basic theory of voltage, current, resistance, series & parallel DC circuits, meter circuits, and Ohm's Law in an interesting fun-to-do manner. **KIT/TEXTBOOK COURSE** . . . begins with basic experiments with dry-cell batteries, then starts the assembly of a volt-ohm-milliammeter which is then used for further experiments. The profusely illustrated manual is written in a non-technical language to guide the reader through the experiments . . . theory is fully grasped without a technical background. The final product is a handy volt-ohm-milliammeter which can be used for countless measurements . . . plus a thorough basic knowledge of electronics for you.

Kit EK-1, 4 lbs. **\$19.95**

B Basic Radio . . . A 2-Part Course

• Simplified radio theory • Textbook/kit combination • Teaches as you build • Requires V-O-M from EK-1 kit above or equivalent to complete all experiments

AN ABSORBING TWO-PART COURSE. Basic Radio Part I (EK-2A) teaches the basic components of a receiver and elementary radio-theory while simultaneously starting the assembly of a simple crystal receiver. As you progress from chapter to chapter, improvements are made on this basic receiver circuit by adding additional tuned circuits and tubes until a regenerative receiver is built that will receive stations hundreds of miles away.

Basic Radio Part II continues with additional components and text to extend knowledge to more complex circuits and terminology. Final result is a refined 2-band Superheterodyne receiver that will receive broadcast, amateur radio, marine and international stations (550-1600 kHz & 3-10 MHz).

Kit EK-2A, Basic Radio Part I, 7 lbs. **\$18.75**
Kit EK-2B, Basic Radio Part II, 5 lbs. **\$18.75**
AK-8, Accessory Cabinet for completed receiver, 3 lbs. **\$3.95**

C Basic Transistors

AN EXCELLENT INTRODUCTION TO THE "HOW" AND "WHY" OF TRANSISTORS. Here in simple, easy-to-understand language is explained the wonder of the age . . . the tiny transistor and its associated circuitry. Some of the circuits assembled include a two-transistor radio, wireless broadcaster, audio amplifier, and an audio test oscillator. All parts are included for the final experiment . . . the complete assembly of a highly useful two-station intercommunications system. The basic transistor theory gained in this course will simplify servicing and trouble-shooting transistorized circuitry and equipment. EK-3 is an ideal course for the beginner, and an excellent refresher course for the service technician.

Kit EK-3, 4 lbs. **\$16.95**

D Heathkit Electronic Workshop "19"

• Contains all materials & instructions for building 19 different electronic items • Includes code flasher, public address system, 5 different transistor radios, electronic timer, burglar alarm, electric eye, TV silencer, metronome, voice and capacity operated relays, and more • Fast, solderless, spring-type connectors • Operates on safe, economical flashlight batteries (not included)

MOST POPULAR BASIC ELECTRICITY KIT. The Heathkit Electronic Workshop is the basic educational kit you've asked for most. It is absolutely safe from electrical shock hazards, since power is provided by four flashlight cells (not included) . . . perfect for the junior scientist of your family. He can explore the exciting world of electronics through kits that are truly practical, that "really work," and that can be re-built over and over again.

Kit SK-50, 4 lbs. **\$12.95**

For Uniform Prints Every Time... Heathkit® Photo Aids!



PM-14
\$89⁰⁰

PT-15
\$24⁹⁵

Why Waste Paper To Get A Perfect Print? Get The RIGHT Exposure The FIRST Time With The Fotoval® Computer

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

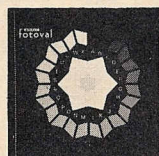
Eliminates Costly Makeovers . . . Saves You Time, Paper And Money. The Heath/Mitchell Fotoval Darkroom Computer analyzes any black and white negative, and automatically provides correct exposure times . . . computes negative contrast . . . tells you what paper grade to use. Guesswork is eliminated through accurate measurement . . . you produce uniformly 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.

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

Even Lets You Print Now, Develop Later! Since all darkroom variables are held constant, you can store your prints for developing later. Or you can keep on making prints, while someone else, regardless of experience, does the developing.

Ideal For The Novice As Well As The Professional. The easy operation of the Fotoval makes it simple for the beginner to experience remarkable results even if he's never attempted enlarging before. As easy to build as it is to use. FREE descriptive brochure available.

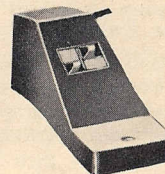
Kit PM-14, 8 lbs. . . No money dn., \$9 mo. \$89.00
PMA-14-1, 4"x5" Test Negative. . . Shipped postpaid. . . . \$15.00



Calibration Negative

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

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



Light-Sensitive Probe

Incorporates all important switching. Measures extremely small light areas when scanning negatives for desired shadows & highlights. Fits easily in your hand & easel corners.

Magnetized base assures adhesion when placed on working surface.

Control Exposures To A 10th Of A Second With The Heathkit Photo Timer

- 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. \$24.95

PT-15 SPECIFICATIONS—Timed cycle: x1.0 Range: 1 to 99 seconds in 1-second steps. x0.1 Range: 0.1 to 9.9 seconds in 0.1-second steps. AC outlets: Enlarger and safelight; each outlet provides 105-125 v. AC @ 350 watts maximum (3 amperes). Accuracy: Actual timed cycle will be within 5% of time selected. Repeatability: All timed cycles at one selected setting within 2% of each other. Switches: 0-90 seconds, in 10-second steps; 0-9 seconds, in 1 second steps; start pushbutton; Time-Focus; Stop; Range; x1.0 & x0.1; On-Off. Controls: x1.0 calibration; x0.1 calibration; sensitivity. Regulation: Internal circuits regulated at 150 volts DC by an OA2 regulator tube. Power requirements: 105-125 v. AC, 50/60 Hz, 6 watts. Dimensions: 6 1/2" W x 6 1/2" D x 3 1/4" H overall.



HOME ENTERTAINMENT

NEW! Transistor Portable Phonograph



GD-16
\$39⁹⁵



4-Speed Changer Plays Anything From The Beatles To Beethoven . . . Suitcase Portability . . . Assembles In Just 2 Hours . . . And Costs Only \$39.95!

- Automatic monophonic play of 16, 33 $\frac{1}{3}$, 45 & 78 rpm records
- 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 117 v. AC household source • Includes 4" x 6" speaker, 45 rpm adaptor spindle, and preassembled pressed wood cabinet covered with attractive, durable olive and ivory polyethylene • Easily assembles in just 1 to 2 hours

ESPECIALLY IDEAL FOR THE TEEN-AGER IN YOUR FAMILY . . . its low cost, portability and playing versatility make the new GD-16 Transistor Portable Phonograph a perfect graduation, birthday or Christmas gift for any youngster. They will appreciate having their very own phonograph to play their favorite records. Its modern designer styling makes an attractive addition to any room. And its compact shape, light 18 lb. weight and easy-grip handle carries like a small suitcase whenever and wherever the gang gets together for parties, dancing, etc.

And since the GD-16 takes only an hour or two to assemble, it's a wonderful way to introduce youngsters to the fun of kit-building. (And it will save wear and tear on your expensive stereo system).

You'll probably want one yourself to add recorded music to a bedroom, family room, on a porch or patio.

DEPENDABLE SOLID-STATE CIRCUITRY . . . a total of 4 transistors and 1 diode. Provides cool, instant operation . . . no warm-up, or tubes to deteriorate. Provides years of dependable, trouble-free service.

VERSATILE AUTOMATIC RECORD CHANGER. Plays all four speeds . . . 16, 33, 45, and 78. Handles stacks of 6 records of the same size. Has separate record size and speed selectors, plus an on/off/reject switch. The long life ceramic cartridge has a dual turnover Sapphire stylus . . . one for LP's, the other for 78's. And there's an adaptor spindle for 45 rpm's. Operation is simple . . . just flip the on/off/rej. switch to play . . . automatically shuts itself off after the last record. And for listening as you like it, there are separate volume and tone controls.

A BREEZE TO ASSEMBLE. Just one small circuit board to wire, mount the 4" x 6" speaker, and plug in two connectors to the pre-assembled changer . . . takes only about 2 hours.

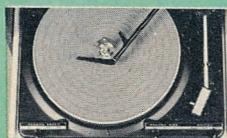
ATTRACTIVE OLIVE AND IVORY CABINET . . . made of pressed wood with a polyethylene covering to stand up under rugged wear. The changer folds up into a neat, compact case that's easy to carry from room to room, or house to house. You can even store around twenty 45 rpm records in a special compartment under the changer. Completely self-contained . . . all you add are records . . . no extras to buy.

Kit GD-16, 23 lbs. . . no money dn., \$5 mo. \$39.95

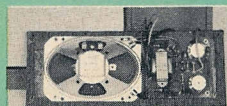
GD-16 SPECIFICATIONS—Changer speeds: 16, 33 $\frac{1}{3}$, 45 and 78. Cartridge type: Ceramic Stylus; Dual turnover; 0.7 mil Sapphire and 3 mil Sapphire. Frequency response: ± 5 db from 100 Hz to 10 kHz with RIAA Equalization. Power output: 2 watt music power. Cabinet dimensions: 14" H x 7 $\frac{1}{4}$ " D x 20 $\frac{1}{2}$ " W. Speaker: 4" x 6", 25 ohm voice coil. Transistors & diode complement: 4 transistors, 1 diode. Controls: Volume and Tone. Power requirements: 120 v. AC, 60 Hz, 15 watts.



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 117 v. AC household source.



4-Speed Automatic Changer . . . plays mono 16, 33, 45 & 78 rpm records. Handles stacks up to 6 records of same size. Separate record size and speed selectors. Automatic shut-off after last record.



Just One Small Circuit Board to wire . . . mount the speaker and plug in the pre-assembled changer. Entire construction time 1 to 2 hours.

"Big-Set" Sound . . .
Longer Battery Life . . .
Super Sensitive Reception . . .
Modern Styling . . .
Deluxe 6-Transistor AM Portable

• 6 silicon transistor, 2 diode circuit gives 8 transistor performance • Uses standard "D" size flashlight batteries . . . only 1/10 the operating cost of typical pocket-size portables • Large 4" x 6" permanent magnet oval speaker for "big-set" sound • Easy-to-read slide-rule dial • "Thumb-touch" controls • Vernier tuning • Tuned RF stage & double-tuned I.F. stage for greater sensitivity & selectivity • Big 1/2" diameter built-in rod antenna for distant station reception • Handsome black simulated leather case • Fast, simple circuit board construction

IDEAL FOR OUTDOOR LISTENING . . . take the GR-24 camping, boating, picnicking—anywhere you go. Its husky audio output stage puts out a healthy 250 milliwatts for a crisp, bold sound . . . even when battery voltage finally runs low. Easily keeps you in earshot of the latest news, weather, ball scores and pop music. Its big 1/2" diameter ferrite rod antenna picks up stations miniatures can't get . . . with pulling power that rivals hi-fi receivers. Has a tuned RF stage and double-tuned IF stage for extra sensitivity and selectivity. Carries easily too . . . with its compact shape, light weight and easy-grip handle.

COST 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.

MODERN DESIGNER STYLING. Makes a handsome companion with its black simulated leather case, chrome-finish frame and anodized aluminum grille. You'll find station tuning quick and easy too . . . with the two "thumb-touch" controls and slide-rule dial. Takes only around 4 to 6 hours to build with fast circuit board construction . . . a perfect way to discover the fun of kit-building!

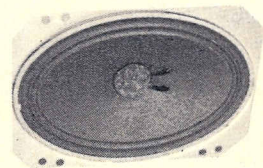
Kit GR-24, 5 lbs. . . no money dn., \$5 mo. \$28.25

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. **Battery:** 9 v; 6 "D" flashlight cells. **Current drain:** No signal: 11 ma; 50 mw audio output: 41 ma. **Dimensions:** 3 3/4" D x 8 3/4" W x 7" H (overall).

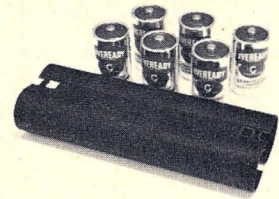
Take Along A Heathkit® Portable!



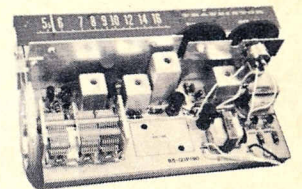
GR-24
\$28.25



Large 4"x6" PM Oval Speaker . . . provides a "big-set" sound that can't be matched by miniatures.



Runs On 6 Inexpensive Size "D" Flashlight Batteries . . . only 1/10 the operating cost of pocket-size portables. Plastic battery holder protects against corrosion.



Wide, Open Chassis Layout . . . and simple circuit board construction assure fast, easy assembly. Takes around 4 to 6 hours.

A Concerto At The Beach? It's Easy When You Bring Along This Deluxe 10-Transistor FM Portable

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

TIRED OF THE USUAL RADIO FARE? Then take along the quiet relaxing beauty of FM with this compact "go anywhere" Heathkit portable. Enjoy classical or standard favorites at the beach, on a camping trip, at the ballpark . . . anywhere your travels take you.

DELUXE FEATURES FOR HI-FI PERFORMANCE! A 10-transistor, 2 diode circuit with 3 I.F. stages deliver full fidelity and com-

plete quieting . . . a push-pull output stage drives the 4" x 6" oval PM speaker for low distortion and "console" sound . . . automatic frequency control for ease of tuning. There are even connectors for an external antenna, and a headphone jack for private listening or connection to your hi-fi system.

BUILD IT IN A COUPLE OF EVENINGS! A preassembled "front-end," prealigned I.F. transformers and simple circuit board construction assure fast, easy assembly. Runs on 6 inexpensive size "C" flashlight batteries (not included).

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

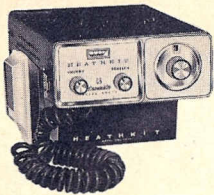
GR-61 SPECIFICATIONS—Tuning Range: 88 MHz to 108 MHz. **IF frequency:** 10.7 MHz. **Audio Output:** 250 milliwatts. **Loudspeaker:** 4" x 6" permanent magnet. **Tone Control:** Treble-cut. **Battery:** 9 volt, 6 "C" flashlight cells. **Battery Life:** 300 to 500 hours. **Dimensions:** 7 3/4" H x 10" L x 4" D (overall). **Styling:** Sun-tan simulated leather case, curved beige plastic grille.



GR-61
\$44.95

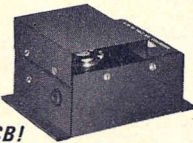


CITIZEN'S BAND



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

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

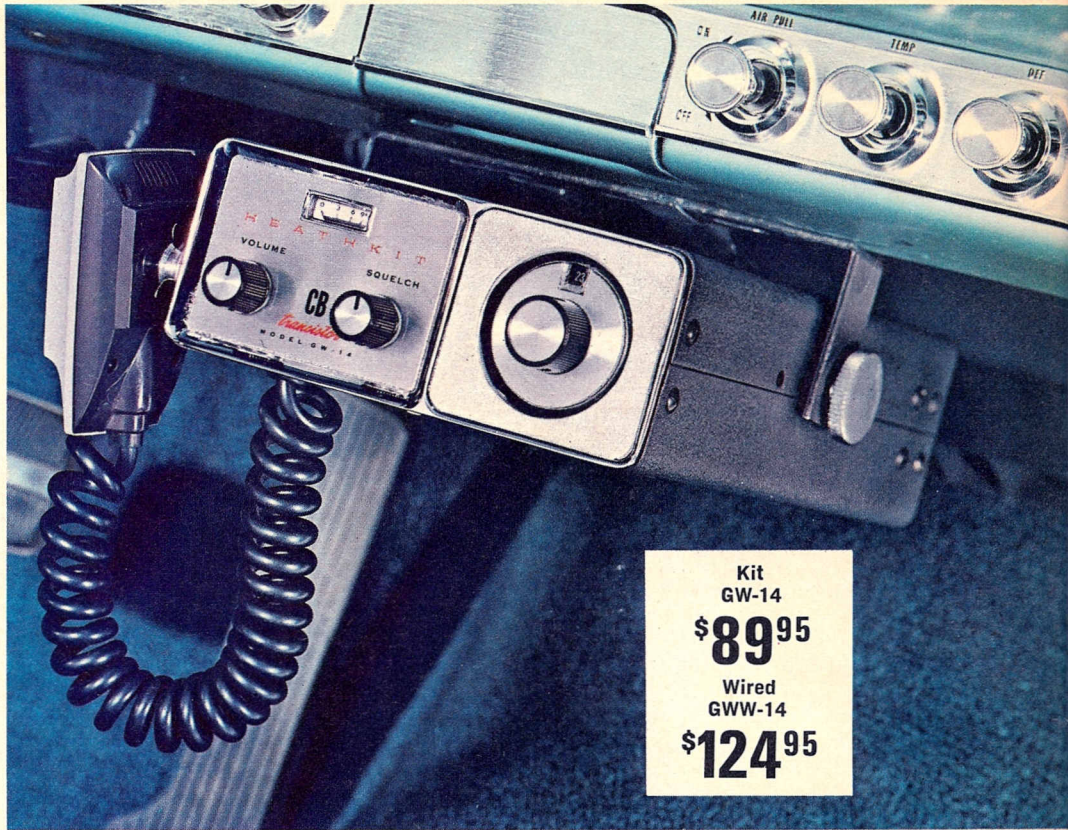


6 To 12 Volt Converter For Mobile Transistor CB!

Converts 6 volts to 12 for "mobile" operation of GW-14... or any other transistor device whose power requirement does not exceed 750 ma regulated (1 amp unregulated) @ 13 v. DC. Measures only 2 7/8" H. x 5 1/4" W. x 3 3/4" D. ... fits neatly on the firewall of a VW, Porsche, any car with 6 v. DC neg. gnd. system. Includes power cables.

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

Save 5% On Orders Of Two Or More



Kit GW-14 \$89.95
Wired GWW-14 \$124.95

23-Channel Solid-State 5-Watt CB Transceiver . . .

Clean, Crystal-Controlled Signals, Compact Size, Low Battery Drain

• 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 set available • Full 5 watt performance . . . a minimum of 3 watts RF output, plus 3 watts audio modulating power • Only 2 7/8" H x 7" W x 10 1/2" D . . . ideal for car, boat, any mobile installation • Front panel "S" meter indicates signal strength & relative power output . . . also aids in alignment • Adjustable squelch control . . . eliminates all speaker hiss during standby • Automatic noise limiter . . . minimizes noise from ignition systems, etc. • Built-in PM speaker mounts on the left side to disperse sound to driver • 1/2 uv sensitivity for 10 db signal plus noise to noise ratio • Easy to build circuit board construction • Gimbal mounting bracket for versatility of installation • Attractive Turner Ceramic PTT Mike • Handsome die-cast, chrome-plated front panel with rust-resistant aluminum charcoal gray cabinet

FULL CB PERFORMANCE WITH MODERN SOLID-STATE DEPENDABILITY! Transmit and receive on all 23 CB channels . . . with crystal-controlled reliability . . . on this versatile transistorized transceiver. Just flip to any desired channel on the lighted channel selector, and you're set for instant 2-way communications. Its 14 transistor, 6 diode circuit keeps the GW-14 running cool and collected . . . no component deterioration as with tube types. Draws only 0.75 amps when transmitting, 0.12 amps on receive.

IDEAL FOR CRAMPED QUARTERS . . . measures only 2 7/8" H. x 7" W. x 10 1/2" D. . . fits snugly under the dash of your car, boat, jeep, truck, etc. Mounts in any position, too . . . thanks to gimbal mounting bracket.

FULL POWER FOR MAXIMUM DISTANCE! A minimum of 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 . . . eliminates interaction problems.

ONLY 3 SIMPLE CONTROLS TO OPERATE. Off/On/Volume control, Adjustable Squelch and lighted Channel Selector. An automatic noise limiter minimizes ignition system and motor noise.

GOES TOGETHER QUICKLY AND EASILY! Takes only around 9 hours. All parts mount on a single circuit board . . . reduces chance for wiring errors. And to aid servicing and trouble-shooting, the foil circuit pattern is screened on the board top . . . allows quick circuit tracing. Includes a smartly styled TURNER ceramic microphone, DC power cables and crystals for one channel (specify no.). For 12 v. neg. ground only . . . operates on AC with accessory power supply, GWA-14-1 @ \$14.95, or on 6 v. sources with optional 6 to 12 v. converter, GWA-14-4 @ \$14.95. Use must comply with Part 95 FCC regulations.

Kit GW-14, 8 lbs., no money dn., \$9 mo. \$89.95

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

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

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

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

GW-14 SPECIFICATIONS—RECEIVER SECTION: General description: 6-transistor super-heterodyne circuit with RF amplifier, squelch, noise limiter, 23-channel crystal controlled tuning with tuning and relative signal strength indicator. Intermediate frequency: 455 kHz. Sensitivity: 1/2 uv or less for a 10 db signal plus noise to noise ratio. Selectivity: Adjacent channel attenuation is down 30 db. Audio Power output: 3 watts minimum. **TRANSMITTER SECTION:** Nominal power input to final RF amplifier: 5 watts. Frequency control: 3rd overtone quartz crystal as selected by the 23-position channel selector switch. Frequency control effectiveness: Operating frequency will be within .005% of nominal crystal frequency over an ambient temperature range of -20 to +130 degrees F. Modulation: High level AM limited to less than 100%. Output impedance: 50 ohms nominal. Output circuit: Twin "PI" matching network. Power output: 3 watts minimum into 50 ohms load. **GENERAL—Controls:** Squelch; off/on volume; channel selector. Tuning meter: For receiving, S-9 corresponds to approximately 100 uv signal input. For transmitting, the meter indicates the presence of power output and modulation peaks. Power requirements: Positive 12 volt system (13.5 volts); receiver current drain, standby—120 ma.; transmitter current drain—750 ma. Dimensions: 2 7/8" H x 7" W x 10 1/2" 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.

5-Watt Heathkit® CB Transceivers



Deluxe 5-Channel "Fixed Or Mobile" 5-Watt CB Transceiver



MW-34
\$84⁹⁵

- Front panel crystal socket—allows quick, convenient changing of one transmit crystal without removing cabinet
- Spotting switch—generates a signal to tune receiver to exact frequency of changeable transmit channel
- TVI filter—minimizes interference with TV sets
- Calibrated "S" meter
- 5 crystal-controlled transmit & receive channels
- 3-way power supply—6 or 12 v. DC, 117 v. AC
- Superhet receiver with RF stage for high performance
- Styled in handsome Heathkit marine motif
- Easy to build
- Complements Heath marine radiotelephones as alternative means of communication in many boating areas

IDEAL FOR BOAT, CAR AND HOME With its compact size, 3-way power supply (117 v. AC, 6 or 12-v. DC) and gimbal mounting bracket, the MW-34 installs virtually anywhere you wish to set up CB communications. Its rust-resistant black & white aluminum cabinet matches Heathkit marine gear . . . provides additional boating communications in many areas.

DELUXE OPERATING CONVENIENCE Superhet receiver with RF stage permits tuning of all 23 channels with lighted dial and accurate vernier tuning. With the front panel crystal socket you can quickly change one transmit channel without removing the cabinet . . . transmit on any CB channel. Also has adjustable squelch, automatic noise limiter, and built-in speaker.

SIMPLE TO BUILD 2 color, step-by-step instructions speed assembly. Includes PTT microphone, AC and DC power cables, crystals for 1 channel (specify channel no.) and FCC license pack. Use must comply with Part 95 FCC regulations. Order a pair . . . one for fixed, one for mobile . . . and save 5%!

Kit MW-34, 18 lbs. . . no money dn., \$9 mo. \$84.95

MW-34 GENERAL DESCRIPTION: RECEIVER: 5-tube superheterodyne circuit with RF stage, squelch & automatic noise limiter. **Variable receiver tuning:** Any one of 23 Citizen's Band channels selected by front panel variable tuning dial (frequencies 26.965 to 27.255 MHz). **Crystal-controlled receiver tuning:** Any five of 23 Citizen's Band channels determined by particular crystals installed in unit. **Sensitivity:** 1/2 uv for 10 db signal-to-noise ratio. **Selectivity:** 5 kHz @ 6 db down from peak response. **Input impedance:** 50 to 70 ohm. **TRANSMITTER SECTION: Nominal power input to final RF amplifier:** 5 watts. **Output impedance:** 50 to 70 ohm. **GENERAL SPECIFICATIONS—Meter:** For receiving, S9 scale indication corresponds to approximately 30 microvolts signal input. **Power requirements:** 105-125 volts, 50/60 Hz, AC 72 watts. 12 volts DC, 4.5 amperes; 6 volts DC, amperes. **Dimensions: Overall;** 4 3/4" H x 8 3/4" W x 11" D.

Heathkit 5-Channel 5-Watt Transceiver . . . High In Performance, Low In Cost



GW-22A
\$47⁹⁵

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

VERSATILITY AT AN EASY-ON-THE BUDGET PRICE Here's a handy Citizen's Band transceiver with features and performance that fill virtually any communication need. Use it anywhere . . . farm, home, car, business . . . and enjoy years of dependable, trouble-free performance whenever and wherever you need it. And since you do the quick and easy assembly yourself, you enjoy the additional savings.

COMPARE THE VARIETY OF OPERATING CONVENIENCES. There are 5 crystal-controlled transmit and receive channels . . . just flip to the desired frequency and you're ready for "solid-copy" communications. For increased sensitivity, there's the superhet receiver with RF stage. And with the built-in squelch and noise limiter, you're assured of interference-free communications.

In addition, there are external connectors for adding an extra speaker (one is already built in) if desired, highly efficient push-to-talk circuitry, and a rugged two-tone brown metal cabinet. Includes push-to-talk microphone, power cable and crystals for one channel (specify frequency no.). Choose the AC model for "fixed", and DC version for "mobile" operation. Pick a pair and deduct the 5% savings! Use must comply with Part 95 FCC regulations.

Kit GW-22A (117 v. AC), 13 lbs. . . no money dn., \$5 mo. \$47.95

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

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

Ideal Where Only One Channel Is Desired . . . Low-Cost 5-Watt CB Transceiver



GW-12A
\$34⁹⁵

- Crystal-controlled transmit & receive channel
- Built-in squelch & automatic noise limiter
- Superheterodyne receiver
- Ideal for fixed or mobile use
- Clean, open circuit layout for quick, easy assembly
- Includes cabinet, push-to-talk mike, & crystals

IDEAL FOR MOBILE FLEETS . . . truck lines, cabs, delivery services, etc. . . . where only one channel is needed. No missed calls or unnecessary usage. And think of the time and effort you can save with a home and car installation . . . savings that will pay for the GW-12 many times over.

VERSATILE FEATURES Automatic noise limiter and adjustable squelch for crisp, clear communications at all times . . . built-in AC power supply with plug-in connection for a DC power supply for 6 or 12 v. mobile operation . . . PTT mike . . . 2-tone brown metal cabinet . . . crystals (specify channel no.). Use must comply with Part 95, FCC regulations. Order two or more and save 5%!

Kit GW-12A (AC only), 10 lbs. . . No money down, \$5 mo. \$34.95

Kit GW-12D (AC & DC), 13 lbs. . . No money down, \$5 mo. \$39.95

GW-12 GENERAL DESCRIPTION—Receiver section: 4-tube superheterodyne circuit with built-in squelch and noise limiter function. **Sensitivity:** 1 uv signal at antenna input produces 10 db signal to noise ratio. **Selectivity:** 7.5 kHz at points 6 db down from peak response. **Transmitter section:** Power input to final RF amplifier; does not exceed 5 watts. **Frequency control effectiveness:** Within .005% of nominal crystal frequency over an ambient temperature range of -20 degrees F to +130 degrees F. **Power requirements:** 117 v. AC operation, 50 watts; 6 v. DC, 8 amps; 12 v. DC, 4 amps. **Dimensions:** 5 3/4" H x 8 3/4" W x 6 1/2" D.



Keep In Touch With a

Ideal For Boy Scouts, Campers, Etc . . . 4-Transistor, 100 Milliwatt Walkie-Talkie . . . No License Required

• Crystal-controlled transmitter-superregenerative receiver • Operates up to 70 hours on built-in battery • No license, forms, tests or age limit • Small, compact size-fits easily in pocket • Fast, stable circuit board construction • Sturdy steel case

OPERATES ¼ MILE OR MORE! Ideal for hunters, fishermen, farmers . . . dozens of time and labor-saving uses. Smaller than a canteen . . . easy to hold in your hand, fits neatly in a pocket or purse. And it's easy to use . . . flip it on, push to talk, release to listen. No license, tests, forms or age limit required . . . anyone from Mom to the Boy Scout in your family can use it. Runs up to 70 hours on a 9 v. battery. Assembles in an evening. And its steel cabinet is attractively styled with a 2-tone green enamel finish that's baked on for long wear and easy cleaning. Includes crystals (specify channel no.). Less battery. Choose a pair for added savings.

- Kit GW-31A, 2 lbs. \$19.95
- Kit GW-31-2 (pair), 4 lbs. No money down, \$5 mo. \$35.00
- GWA-30, Battery Set, (2) . . . 1 lb. \$2.95

GW-31A SPECIFICATIONS—Receiver: Superregenerative detector. **Sensitivity:** Usable with signals as low as 6 uv at antenna. **Transmitter:** Crystal-controlled, any channel 2 to 23 (unlicensed) in 11 meter citizens band. **Power Input:** 100 milliwatt. **Battery:** 9-volt. **Antenna:** 36" whip. **Circuit:** 4-transistor. **Dimensions:** 5 7/8" H x 3 3/8" W x 1 1/2" D.

Deluxe 9-Transistor, 100 Milliwatt Walkie-Talkie . . . Hundreds Of Uses In Business, On The Farm, Or For Leisure

• 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

FULFILLS A VARIETY OF COMMUNICATION NEEDS! Use for boat to shore communication, in-plant communication between lift trucks, handlers, etc., communication on a small farm, a roving microphone on convention floors, camping expeditions, hunting and fishing trips, construction jobs, surveyors . . . anywhere portable 2-way communications are needed.

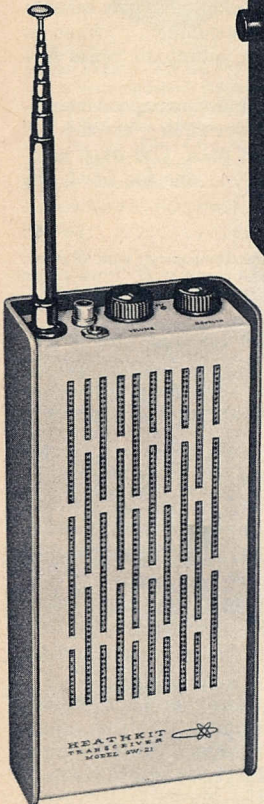
OPERATES UP TO A MILE BETWEEN UNITS . . . even greater distances with a 5-Watt CB Transceiver or external antenna. Easy to operate . . . just set volume and squelch controls to desired level, push a button to talk, release to listen.

ANYONE CAN USE IT! No license is required for operation 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 rust-proof aluminum case, shoulder strap, crystals (specify channel no.), earphone for private listening. Simple circuit board assembly. Less battery. Choose a pair for extra savings.

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

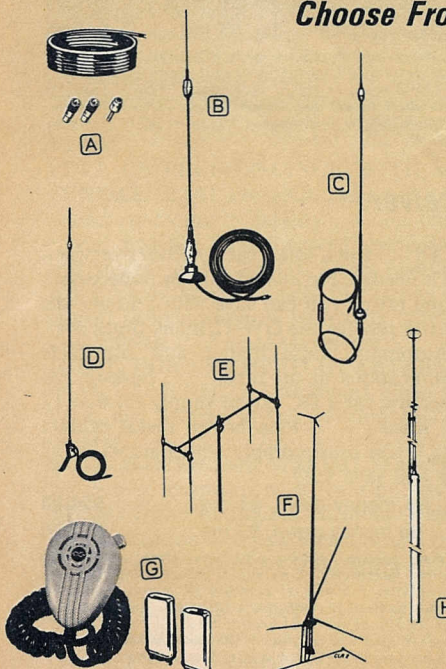
GW-21A SPECIFICATIONS—Receiver: Crystal-controlled superheterodyne. **Sensitivity:** 1 uv for 10 db s/n ratio. **Transmitter:** Crystal-controlled, any channel 2 to 23 in 11 meter citizens band (unlicensed). **RF Input Power:** 100 milliwatt. **Battery:** 9 volt. **Antenna:** 35" whip. **Circuit:** 9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

GW-31A
\$19⁹⁵
(pair \$35.00)



GW-21A
\$39⁹⁵
(pair \$74.95)

For Improved CB Performance, Choose From These Special Accessories



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. 27.235 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.

A Coax Cables. Ideal for use with any Citizen's Band or Amateur radio communications systems. Also ideal for GDP-285, GDP-56 and GDP-275 CB Base Station Antennas below. Each kit contains 2 coax plugs & 1 phono plus instructions. RG8U type.

- Kit GD-295, 50 ft., 2 lbs. \$3.75
- Kit GD-305, 100 ft., 4 lbs. \$5.50

B Hy-Gain Roof Top Mobile CB Antenna. The famous Shorty "Roof-Topper." Overall height 22".

- GDP-245, 2 lbs. \$15.50

C Hy-Gain AM/CB Mobile CB Antenna. Telescoping "Duo-Topper." 28" min.—50" extended. Includes coax, coax connector, rf coupler, & AM radio plug . . . all preassembled.

- GDP-255, 2 lbs. \$14.95

D Hy-Gain Trunk Mount Mobile CB Antenna. "Jiffy-Topper." Overall height 50". Includes 16' of coax cable plus connector.

- GDP-265, 2 lbs. \$13.95

E Hy-Gain Dual Beam CB Base Antenna. Duo-Beam 4 model 114DB. 42 watts effective radiated power from a 5-watt rig with this roof-top vertical-element antenna!

- GDP-275, 16 lbs. no money dn., \$5 mo. \$39.95

F Colinear CB Base Antenna. Ground plane type antenna. Overall height of radiator . . . 19'10"—length of radials. . . 9'. Provides the most efficient omni-directional base station antenna.

- GDP-285, 8 lbs. no money dn., \$5 mo. \$29.95

G Model GH-12 Microphone, 2 lbs. \$6.95

Push-to-talk type with tailored response for crisp communications. Complete with coiled cable, less connector.

Extra Transmit & Receive Crystals. Only \$1.99 each with any Heathkit transceiver order! Otherwise \$2.95 each. Specify base/mobile or handheld transceiver. 1 lb.

Special 23-Channel CB Package!

Transmit & Receive crystals for all CB channels . . . 46 crystals in all! A regular \$135.70 value!

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

H New Antenna Specialists Model M-148 Co-Ax Omni Base Station Antenna with visual RF output indicator . . . Speakin' Beacon lights up when you transmit! Easily installed . . . gamma matched . . . built-in lightning protector.

- GDP-56, 7 lbs. REA or motor frt. only. no money dn., \$5 mo. \$29.95

Heathkit® Walkie-Talkie!



New! Heath 2-Watt Walkie-Talkie . . . Completely Assembled, Ready To Use . . . Up To 6 Mile Range . . . Even Works In Steel Buildings!

- 9 silicon transistor, 2 diode circuit for dependable operation over a wide temperature range • Includes \$20 rechargeable battery • Crystal-controlled transmit and receive • Superhet receiver with RF stage • Adjustable squelch and automatic noise limiter • DOT approved • Rustproof heavy-gauge aluminum case styled in handsome 2-tone green • Ideal for construction crews, factory & office, personal communications, and wide range of sports such as hunting, fishing, boating • Assembled & factory tested

COMPARE THESE FEATURES AGAINST OTHER, MORE COSTLY MODELS! Features like the all silicon transistors for cool, instant performance over a wide temperature range . . . tested operating at -30° F and $+150^{\circ}$ F; 2 watts of power for up to 6 mile inter-unit range . . . up to 10 miles when used with a 5-watt CB base station; a \$20 rechargeable battery for 8-hour use per charge . . . total life up to 5000 hours; adjustable squelch and automatic noise limiter to eliminate atmospheric noise, or ignition and electrical interference; a 36" telescopic whip antenna, plus external antenna connectors; and superhet receiver with RF stage to pull in weak stations with ease.

COMPACT, EASY-TO-HANDLE! Its slim, trim size and light 2½ lb. weight make for easy handling . . . includes leather shoulder strap, elastic hand strap, and rust-proof metal cabinet. Optional 117 v. AC battery charger and car cigarette lighter charger cord for recharging while you operate from car's 12 v. battery system are also available. Requires two crystals . . . only \$1.99 each when ordered with your GRS-65A (specify channel no.). Completely assembled, not a kit. Use must comply with Part 95 FCC Regulations.

Assembled GRS-65A, less crystals and battery charger, 3 lbs. . . No money down, \$10 mo. Expected Shipping Late Sept. **\$99.95**
GRA-65-3, 117 v. AC battery charger plus cigarette lighter charging cord, 2 lbs. Expected Shipping Late Sept. **\$9.95**

GRS-65A SPECIFICATIONS—Receiver: single channel crystal controlled superheterodyne. Sensitivity: 1 mv for 10 db signal-to-noise ratio. Selectivity: 5 kHz at 6 db. Audio power output: 400 uv. Input to final stage: 2 watts. Transmitter frequency: crystal-controlled. Battery: 500 mah rechargeable nickel cadmium, 8 hours use per charge. Battery life: 5000 hours normal use, 1500 minimum. Standby receiver drain: Dimensions: 8" x 3½" x 1½".



Heathkit 1-Watt Walkie-Talkie . . . Operates Up To 3 Miles . . . Includes \$20 Rechargeable Battery!

- 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

READY TO GO ANYWHERE to provide efficient 2-way communications up to 3 miles between units . . . 5 to 10 miles when used with an external antenna or 5-Watt base stations. Features superhet receiver with RF stage; adjustable squelch and automatic noise limiter; and 10 transistor, 2 diode circuit.

\$20 RECHARGEABLE BATTERY . . . lasts a minimum of 1500 hours and up 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! Fast circuit board construction speeds assembly. 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. Order a pair for extra savings.

Kit GW-52A, 4 lbs. . . No money down, \$7 mo. **\$69.95**
Kit GW-52-2, 8 lbs. . . No money down, \$12 mo. **\$129.95**

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: 10½" H x 3½" W x 1½" D.

Save 5% When You Buy 2 Or More 5-Watt Transceivers; Just Deduct 5% From Order Blank. New Lower Prices On All Units!

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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 250 kits . . . the world's largest selection. Whatever your interest, you'll find a kit to match it in this 108 pg. catalog . . . color TV sets; all-transistor electronic organs; AM, FM, and shortwave portable and table model radios; home & office intercoms; automatic garage door opener; educational home study kits covering basic electronics; amateur radio gear; stereo/hi-fi components; citizen's band units; marine and automotive accessories; test and lab instruments. In addition, Heath has recently entered the educational and research/development fields with a line of factory assembled instruments.

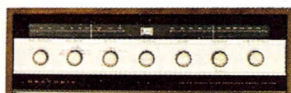
In order to produce the vast array of Heathkit equipment, a modern 205,000 sq. ft. plant (shown above) was constructed in 1958 on the shores of Lake Michigan in St. Joseph, Mich. If you are planning a visit to Michigan, we invite you to stop in and pay us a visit. We're located on Hilltop Rd. just off Business route I-94, south of St. Joseph.



Famous Heathkit® Firsts

- ★ First Electronic Guitar Kits
- ★ First to offer kits with all required parts included.
- ★ First Citizen's Band Transceiver Kit
- ★ First High Performance, Self-Aligning Amateur Radio Receiver Kit
- ★ First Marine Depth Sounder Kit
- ★ First All-Transistor Shortwave Receiver Kit
- ★ First All-Transistor AM/FM/FM Stereo Receiver Kit
- ★ First Linear Tuning, 1 kc Calibration Line of Amateur Radio Gear Kits (Deluxe SB Series)
- ★ First Successful Color TV Kit
- ★ First Ignition Analyzer Kit
- ★ First Tunnel Diode Kit for Amateur Radio Gear
- ★ First Crystal Filter Kit for Amateur Radio Gear
- ★ First And Only HV Regulated and Solid-State Regulated LV Power Supply Kits
- ★ First And Only Impedance Bridge and Q-Meter Test Instrument Kits
- ★ First Analog Computer Kit
- ★ First Vacuum Tube Voltmeter, Oscilloscope, & Lab Instrument Kits
- ★ First Automatically Sequenced Fog Horn Kit
- ★ First Color Bar & Dot Generator Kit
- ★ First Transistor Portable Radio Kit
- ★ First Williamson Hi-Fi Amplifier Kit
- ★ First Transistor Stereo Amplifier and Tuner Kits
- ★ First Alignment Generator with Electronic Sweep Circuit
- ★ First Photographic Aid Kits (PM-14 & PT-15 Photo-Timer)
- ★ First Tape Recorder Kit
- ★ First manufacturer in the high fidelity industry with Amplifier Rating Standards.
- ★ First to extensively use circuit boards in amateur radio kits.
- ★ First to produce electronic kits overseas.
- ★ First Electronic Kit Manufacturer to build a pre-tuned FCC type accepted Radiophone for outboard installation.
- ★ First Electronic Kit Manufacturer to furnish a complete marine communications system . . . radiophone, antenna & ground system.
- ★ First Electronic Kit Manufacturer to utilize voltage sensing for fuel vapor detectors.
- ★ First Electronic Kit Manufacturer to use "Check-By-Step" instructions in assembly manual.
- ★ First Electronic Kit Manufacturer to provide calibration and adjustment procedures.
- ★ First Electronic Kit Manufacturer to develop highly specialized products for college educational programs.
- ★ First Electronic Kit Manufacturer to use fold-out pictorials in assembly manuals.
- ★ First Electronic Kit Manufacturer to incorporate soldering instructions that use the "(S-1)" double-check system in assembly manual.
- ★ First Electronic Kit Manufacturer to provide single adjustment of a multi-band signal generator.
- ★ First Electronic Kit Manufacturer to screen values and part locations on kit circuit boards.
- ★ First Electronic Kit Manufacturer to include adequate calibration in voltmeters.
- ★ First Electronic Kit Manufacturer to provide oscilloscope input attenuator adjustment capability without need of extra equipment.
- ★ First Electronic Kit Manufacturer to supply precision components where useful.
- ★ First Electronic Kit Manufacturer to offer a tube checker that provides constant current power supply for tube filaments.
- ★ First Electronic Kit Manufacturer to offer a graduate level electronic teaching system (EU-100A) for chemists, M.D.'s, etc.
- ★ First Electronic Kit Manufacturer to own patents on new circuits (e.g., scope sweep circuit).

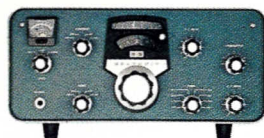
A KIT FOR EVERY INTEREST!



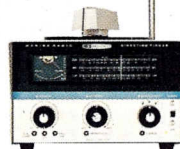
STEREO/HI-FI



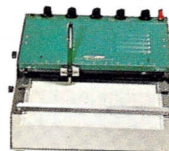
GARRARD STEREO CHANGERS



AMATEUR RADIO



MARINE ELECTRONICS



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