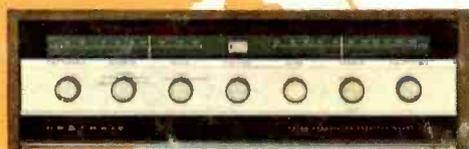


# HEATHKIT® 1966

CATALOG-810/60A



STEREO/HI-FI



SHORTWAVE RADIO



COLOR TELEVISION



CITIZEN'S BAND



TEST EQUIPMENT



AMATEUR RADIO



MARINE ELECTRONICS

over  
250  
electronic kits—  
world's largest selection





# HEATH COMPANY

Phone 616-983-3961 • TWX-616-983-3897 • Benton Harbor, Michigan 49023

In 1966 Heathkit Will  
Help Millions of People  
To Enjoy Life More!

Dear Friends:

It is a pleasure to send you this copy of the new 1966 Heathkit catalog. It contains a full selection of kits for stereo/hi-fi, marine, amateur radio and test equipment, and those of general interest such as portable radios, color television sets and electronic organs...all designed to be built at home, with a minimum of effort and a maximum of savings and enjoyment. Included also are many factory assembled units such as the new polarography module for chemists.

Every page of the Heathkit catalog reflects the high standards set by Heath...first in the industry for all types of electronic equipment in easy-to-build kit form. I'm sure you will find several items you want. For example, there is the new Heathkit 25" Color TV on pages 14 and 15, a kit the entire family will enjoy. For the CB enthusiasts there is the new Heathkit 23-channel all-transistor transceiver on page 101, a new high in CB performance.

A break-through in the price barrier of transistor stereo components has been achieved by our engineers--concrete evidence of this is the new low-cost FM Stereo Tuner shown on page 26. You stereo/hi-fi fans will note that our deluxe transistor components are now available less cabinets to facilitate custom installation. We've tried to include something for everyone in the new product presentation--for busy engineers, technician and radio-TV servicemen we now offer many of our test instruments factory assembled.

As always, we are interested in your comments and suggestions on any aspect of our products and service. Just write or phone our Correspondence Department or, if you prefer, write directly to me.

Sincerely,

Charles M. Kirkland  
President

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

# Why Do Millions Build Heathkit® Electronics?

## An Exciting, Rewarding Hobby!

Building your own Heathkit provides that rare sense of self-satisfaction and accomplishment that comes from watching your own creation take shape. Makes those spare-time hours more fun and worthwhile. Helps you to unwind, relax . . . ease daily tensions. Give it a try—you'll discover why millions of people, from all walks of life, enjoy this space-age hobby.



## 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 All-Transistor Organ, pg. 10, you can "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.



## Advanced Engineering, Finest Quality!

Over 300 years of accumulated kit engineering experience are brought to bear on kit design problems in all Heathkit product areas. Each product group has its own staff of specially-trained engineers and technicians 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."

As an extra measure to insure your kit-building success, each new kit is proof-built by persons who've had

very little or no kit-building experience. Their comments and suggestions, with particular attention paid to parts identification, instruction readability, and ease of actual assembly are noted and incorporated into the kit design and construction manuals. And all new kits are continually field-tested by people who are qualified to judge each kit's performance, features and dependability.

As for parts quality, you'll recognize famous names like GE, RCA, Mallory, Weston, etc. on the components you use to assemble your kit.

As for performance, check the features and specifications of a Heathkit against factory-assembled units.



## 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 (see ppg. 54 and 55 for complete shipping details).

**EXPORT MODELS AVAILABLE** . . . on certain kits for 115/230 VAC, 50-60 cps operation. Watch for the "export" note below the price lines in this catalog.

**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 Sprendlingen bei, Frankfurt/Main, Germany.

## Safe, Economical Packaging!

All Heathkit parts come to you in simple paper bags and cartons surrounded by sturdy protective containers. No elaborate, expensive packaging to add to the cost. Yet, when you receive your kit, it's as safe and sound as it was when it left the factory. To you this represents another saving, since the difference in cost is passed on to you in lower prices.

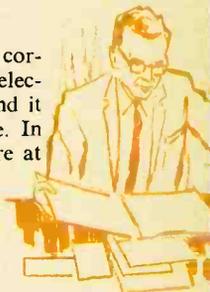


## New Liberal Credit Terms!

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.



## Heathkit Electronic Centers

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

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

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

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

Los Angeles, California  
2309 S. Flower Street  
Phone: RI-9-0261

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

## 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. We suggest you use their fast, factory-quality facilities.

United Sound & Television Co.  
(two locations)  
5036 Venice Blvd.  
Los Angeles, California  
&  
2010 W. Lincoln Ave.  
Anaheim, California

Radio Electronics  
374 Brannan Street  
San Francisco, California

Photo Electronics  
1300 Market Street  
San Diego, Calif.

Mystic Cove Marine Radio  
13505 Bali Way  
Marina Del Rey  
Venice, California

Southern Authorized  
Factory Service  
62 N.W. 27th Ave.  
Miami, Florida

Expert Electronics  
7201 S. Western Ave.  
Chicago, Illinois

Park Armature Company  
1218-30 Columbus Ave.  
Boston, Mass.

Electronic Servicercenter  
of N.Y.  
65-37 Queens Blvd.  
Woodside, New York

Scientific Radio-TV/Hi-Fi  
(two locations)  
4122 E. Madison St.  
Seattle, Washington  
&  
5418½ Sand Point Way NE  
Seattle, Washington

# Here's What Heathkit Owners Say!

## Quality!

MR. RUSSELL E. HEMBROOK, INGLESIDE, 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. DAVID CANNON, WACO, TEXAS: "From a financial standpoint I can't think of a better investment for my money. The construction of the unit (Heathkit AA-100 Amplifier) 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."

MR. BILL PINKENSON, K3WPH, PHILA., PENNA.: "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, WASEGG, 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."

POPULAR ELECTRONICS MAGAZINE: "The GR-53A is not a skimpy receiver in which corners have been cut to keep costs down and still provide color TV. Instead, the GR-53A (on a comparison shopping basis) has the same color and sound fidelity, flexibility and ease of handling as those manufactured sets which sell for over \$600."

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. DAVID MESSNER, NEW CASTLE, PA.: "Just a note to express my thanks for the terrific and thorough service that I recently received on my walkie-talkies. I have tried them over a fairly long range and they perform very well. It is good to know that a company can stand behind their equipment the way you do."

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. RICHARD A. CRAWFORD, LA HABRA, CALIF.: "It has been a pleasure to have had the opportunity to find out first-hand just how nice people like yourselves can be, when a person comes to them with a complaint. Your kindness, consideration, and patience with me was certainly proof to me that the Heath Company and its employees will do everything within reason to try to satisfy a customer."

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!"

MR. EDWARD PAPCZYNSKI, SOUTH BEND, IND.: "I received my kit (GR-151 AM Portable) yesterday and eagerly began to read your very thorough instructions. The kit went together very easily and having never done this before, was very amazed at the ease of construction. I finished the kit and per instructions, tuned it, and lo and behold it worked perfectly."

JOHN SPIRES, WEAVER, ALABAMA: "I am eleven years old and had no help in assembling the kit (GR-81 Shortwave Radio). It was very easy to assemble yet I have never had any experi-

ence 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. Another thing I found was the consistent quality in the parts and

workmanship of the preassembled 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, PENNA.: "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."

## READ WHY YOU CAN BUILD ANY HEATHKIT!

# The Key To Your Success . . . Famous

The World-Renowned Heathkit Construction Manuals Contain The Following Special Features To Help You Build Your Heathkit®

Page 6



## PROPER SOLDERING TECHNIQUES

Only a small percentage of HEATHKIT equipment purchasers find it necessary to return an instrument for factory service. Of these instruments, by far the largest portion of malfunctions are due to poor or improper soldering.

If terminals are bright and clean and free of wax, frayed insulation and other foreign substances, no difficulty will be experienced in soldering. Correctly soldered connections are essential if the performance engineered into a kit is to be fully realized. If you are a beginner with no experience in soldering, a half hour's practice with some odd lengths of wire may be a worthwhile investment.



CRIMP WIRES



HEAT CONNECTION



APPLY SOLDER



ALLOW SOLDER TO FLOW



COLD SOLDER JOINT CONNECTION INSUFFICIENTLY HEATED



PROPER SOLDER CONNECTION



COLD SOLDER JOINT CONNECTION MOVED WHILE COOLING

## 1. "Tips" On Kit-Building

Detailed descriptions and illustrations show you how to solder properly—it's easy for anyone to do after just a few minutes of practice.

## 2. Detailed Parts List

Describes and illustrates each and every part for ready identification once you start building your kit.

## 3. Simple Step-By-Step Procedure

Takes you through each and every assembly step. Tells you exactly what to do, what part to use, and how to do it. Covers kit assembly, alignment, & installation . . . nothing is left to chance! Written in non-technical, everyday language . . . so simple a child can understand!

## 4. Large "Exploded" Diagrams

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

Page 7



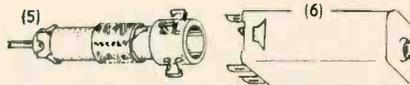
## PARTS LIST

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
----------	---------------	-------------

### Coils-Antenna-Transformers

(5) 40-77	1	BFO coil
40-273	1	Rod antenna
51-45	1	Driver transformer
51-46	1	Output transformer
(6) 52-28	1	IF transformer, interstage
52-29	1	IF transformer, output
52-34	1	IF transformer, input
142-13	1	Whip antenna



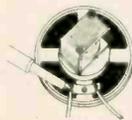
Page 18



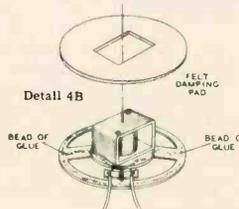
## STEP-BY-STEP ASSEMBLY

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. Now apply the felt pad to the frame. NOTE: Allow the glue to set before proceeding with the following steps.

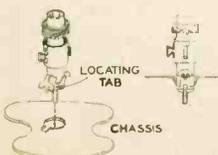


Detail 4A

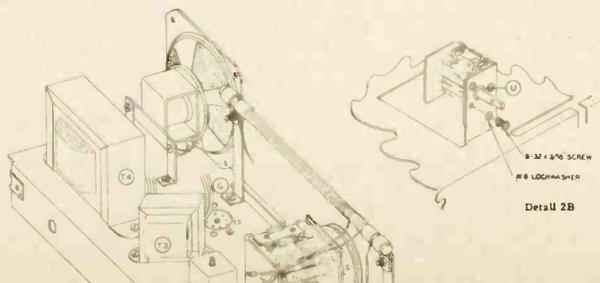


Detail 4B

Detail 2A



6



Detail 2B

Page 35

# Heathkit® Assembly Manuals!

## 5. Complete Operating Instructions

Covers the use of your kit under virtually any situation, and recommends appropriate accessories, if necessary. Even dwells on operational theory, if required, for example—the Heathkit Marine Radio Direction Finder contains 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. In addition, our staff of Technical Correspondents is at your service to answer your every question about construction, accessories, or selection. The Service Information section of the manual tells proper procedures for returning kits for factory service.

## 7. Circuit Description & Schematics

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

## 8. Heathkit Warranty

Heath warrants all kit parts against defects in workmanship and materials for a period of 3 months after sale.

## 9. Order A Manual and Convince Yourself!

Most manuals cost just 50c ppd. Because of their large size, manuals for the Heathkit GR-25, GD-232B, GD-983, GR-53A, & "Ham" SB series cost \$2 ppd. Manuals for EK educational and EF applications series \$5.00 ppd. each. Simply list the model no., and state "Manual only" on the catalog order blank.



### OPERATION

#### THEORY OF DIRECTION FINDING

In order to thoroughly understand the operation of your Direction Finder, you will need some knowledge of the theory of direction finding. Read this theory section first to get the most from the operation and application portions of this manual.

Actually, a radio direction finder is just that;

By its very nature, a ferrite antenna has a maximum pick-up of radio signals in certain directions and a minimum pick-up of radio signals in other directions. The pattern for this ferrite antenna is shown in Part A of Figure 1. Notice that the minimum amount of signal (C) is received from the directions indicated by the two ends of the antenna housing. The maximum amount of signal (B) is received when the antenna housing is broadside to the station



### TROUBLESHOOTING CHART

CONDITION	POSSIBLE CAUSE
Unit completely inoperative.	1. Battery not charged. 2. Off-On switch inoperative.
Receiver dead, transmitter ok.	1. Squelch control misadjusted. 2. Improper adjustment of coil L2. 3. Earphone jack open. 4. Open circuit in diode D2. 5. Faulty transistors - Q1, Q2, Q3, or Q4. 6. Faulty receiver crystal X1.



### CIRCUIT DESCRIPTION

The Circuit Description is provided to give the novice, as well as the technical kit builder, a better understanding of what is happening in the different stages of the receiver. By tracing through the Schematic Diagram when reading the Circuit Description, you can become better acquainted with the Radio.

The "Introduction To Transistors" and the "Glossary Of Radio Terms" in the following section of the manual will help to explain some of the terms used.

The 6-transistor circuit of the receiver con-

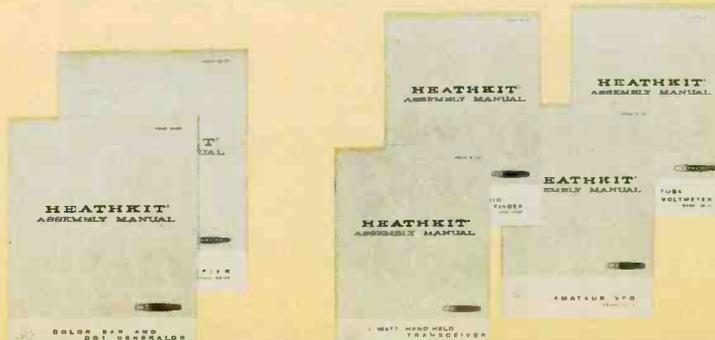


### WARRANTY

Heath Company warrants that for a period of three months from the date of shipment, all Heathkit parts shall be free of defects in materials and workmanship under normal use and service and that in fulfillment of any breach of such warranty, Heath Company shall replace such defective parts upon the return of the same to its factory. The foregoing warranty shall apply only to the original buyer, and is and shall be in lieu of all other warranties, whether express or implied and of all other obligations or liabilities on the part of Heath Company and in no event shall 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 operation of Heathkits or components thereof. No replacement shall be made of parts damaged by the buyer in the course of handling or assembling Heathkit equipment.

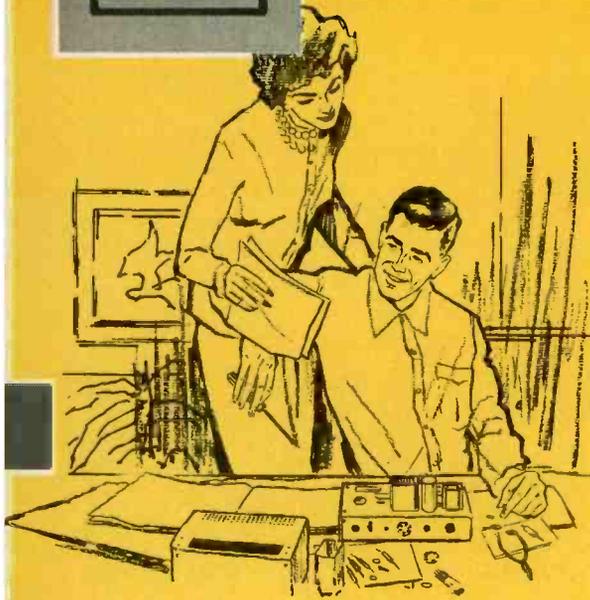
NOTE: The foregoing warranty is completely void and we will not replace, repair or service instruments or parts thereof in which acid core solder or paste fluxes have been used.

HEATH COMPANY





# Recommended Beginner Kits!



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 Pg. 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. 94) 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!

## Shortwave Listener's Radio

- Covers 550 kc to 30 mc—includes broadcast & 3 shortwave bands • 5" round PM speaker • 4-tube superhet circuit plus two rectifiers • Easy-to-read & lighted bandspread tuning dial, & relative signal strength indicator • 7" slide-rule dial • "Low-boy" cabinet styling

This versatile receiver takes only around 8 to 10 hours to build with its fast circuit board assembly, clean open chassis layout, and pre-built "front-end". If you've never heard Short Wave Broadcasts, you have a treat in store for you. Check pg. 91 for details.

GR-64  
**\$37<sup>95</sup>**



AJ-14  
**\$49<sup>95</sup>**  
(less cabinet)

## NEW! 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, pre-aligned front-end tuning unit, and one simple-to-wire circuit board. Leaves only a minimum of easy point-to-point wiring! If you already have a stereo amplifier, this is a good point to begin your kit-building career. See pg. 26 for full details.



GW-31A  
**\$19<sup>95</sup>**  
(pair \$35)

## 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 one evening! Only one simple circuit board to wire before installing in case. Includes crystals (specify channel no.) and alignment tool for quick, simple peaking of receiver. These are fun at any outing, but useful in dozens of practical ways too. Check pg. 104 for details.

# "Beginners" All-Transistor AM Portable!



**Curious About Kit Building?  
Here's A Low Cost Way To  
Prove To Yourself How  
Easy It Is! This Handsome  
"Go-Anywhere" Portable  
Includes A FREE Tool Kit &  
Battery . . . Everything You  
Need To Build & Play It!**



GR-151A  
**\$20.65**  
RADIO, TOOL KIT  
& BATTERY

## Why Do Thousands Build Heathkit Electronics?

A desire for better quality. And pride! Not just the pride of owning something new, but a special kind that comes from building it yourself. From watching it grow and take shape. From creating a sophisticated piece of electronics equipment with your own hands.

True, it takes a little time and effort. Anything worthwhile usually does. But it's a labor of love. The large "exploded" diagrams and simple, step-by-step instructions make it easy—and a lot of fun. No special skills or knowledge are needed!

And when you finish and turn it on, you'll glow with pride and self-satisfaction. You will have joined the millions of people, from 79-year old grandfathers to 11 year old children, who build Heathkits. People with *no* special skills or technical knowledge. People like you!

Why not give it a try? Start with this attractive all-transistor AM Portable. It has everything you need to build it and provides you with countless hours of good listening.

## Takes No Special Skills Or Knowledge To Build . . . Goes Together In Just 4 To 6 Hours With Simple Circuit Board Assembly!

- 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 & 9 v. battery

**HERE'S AN IDEAL WAY TO DISCOVER THE FUN & EASE OF KIT-BUILDING!** If you've never tried your hand at building a kit, then here's the perfect kit for you. Once you start, you'll soon 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 AM portable that you can take to the beach, ballpark, on picnics . . . anywhere! Provides countless hours of good listening, and long reliable service.

Everything is provided to make it as easy & fun to build as it is to use. All parts mount on a clearly marked circuit board. Makes wiring fast and simple. And assures high circuit stability. The non-technical step-by-step instructions assure your success. Even adds to your understanding of how a radio works.

**COMPARE IT TO PORTABLES COSTING MUCH MORE!** Features a 4" x 6" permanent magnet speaker for a crisp, clear sound. The kind you can't get from miniatures. A 6 transistor, 3 diode circuit provides extra power & range . . . a built-in ferrite rod antenna insures distant station pickup . . . and a smart, simulated tan leather case that will withstand rugged wear.

Also makes an ideal gift for any occasion . . . if you can bear to part with it.

Kit GR-151A, radio, tool kit & battery . . .  
5 lbs. . . . . \$20.65



World's Best Buy In Music...  
Heathkit®/Thomas BL-3 "Coronado"  
Deluxe All-Transistor Organ!

GD-983  
**\$799<sup>00</sup>**

(Including bench)  
Only \$125 dn., as low as \$27 mo.



**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.

# Professional Organ Features Including Chimes And Leslie Speaker . . . Everything Included, No Extras To Buy. New Lower Price . . . Save Hundreds Of Dollars From Assembled Models!

ANOTHER PRAISE-WINNER FROM HEATH! Enthusiastic reports from leading magazine editors & GD-983 owners are your assurance that this beautiful instrument is the "World's Best Buy In Electronic Organs." Read a few of their comments opposite!

**EVERY FEATURE YOU WANT IN AN ORGAN!** And all genuine Thomas factory-fabricated parts!

**17 TRUE ORGAN VOICES . . .** Diapason 16' & 8', Bass Clarinet 16', English Horn 8', Violin 8', Oboe 8', Bourbon 16', Flute 8', Flute D', Amour 4', Trumpet 16', Quint 5 1/2', Saxophone 8', French Horn 8', Cello 8', Chimes, Reverb, & Sustain . . . all at the simple touch of a tab. And you can easily learn combinations to produce additional voices . . .

Hawaiian guitar, vibraharp, harpsichord, zither, calliope, bagpipes, etc. And many different musical moods . . . classical, popular, religious.

**2 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 & SUSTAIN PERCUSSION . . .** the first organ to give you all three. Create an infinite number of musical effects . . . xylophone, mandolin, marimba, banjo, string, etc. You can vary the rate of repeat percussion & select short or medium sustain.

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

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

**13-NOTE HEEL & TOE PEDALBOARD . . .** range C thru 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 & beauty.

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

**REVERB . . .** to add concert-hall realism.

**TREBLE ACCENT TAB . . .** adds new clarity & brightness to solo work.

**HEADPHONE OUTLET . . .** play anytime without disturbing others.

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

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

**LUXURIOUS HARDWOOD CABINET & BENCH . . .** handcrafted & hand-rubbed with full-bodied walnut finish. 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 \$1000 more for other makes, and still not enjoy as many features as with the GD-983. You actually save up to \$400 over the factory assembled version.

**TRULY A PROFESSIONAL ORGANIST'S DREAM WITH A BEGINNER'S SIMPLICITY!** And yet you don't have to be an "electronics wizard" to build it, nor a professional organist to play it. Famous "Heath-Engi-nuity" 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 fast.

**Kit GD-983, Organ & matching walnut bench, 245 lbs. . . .**  
\$125 dn., as low as \$27 mo. . . . **\$799.00**  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

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

Can't play a note? Learn quickly & easily at your leisure with this complete 48-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**

## Heathkit/Thomas Organ Music Books!

Contain complete organ music and master registration charts for both GD-232B & GD-983 Heathkit/Thomas organs.

"HELLO DOLLY" All words and music from this famous Broadway musical . . . "Hello Dolly," "Before The Parade Passes By," "It Takes A Woman," "So Long, Dearie," etc. **GDP-165, 1 lb. . . . \$2.00**

"BERLIN'S BEST" Includes words and music of 23 Berlin favorites . . . "Always," "Say It Isn't So," "They Say It's Wonderful," "Soft Lights & Sweet Music," "Remember," "Cheek To Cheek," "How Deep Is The Ocean," etc. **GDP-135, 1 lb. . . . \$2.50**

"AROUND THE WORLD IN WALTZTIME" Contains 14 waltz favorites . . . "In Old New York," "My Wild Irish Rose," "Fascination," "Clair De Lune," "Come Back To Sorrento," "Emperor Waltz," etc. **GDP-155, 1 lb. . . . \$2.00**

"LIGHT CLASSICS" "Serenade," "Serenade For Strings," "Romeo & Juliet," "The Swan," "Adagio," "Melody In F," etc. . . . a total of 12 popular classics. **GDP-145, 1 lb. . . . \$2.00**

## 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."

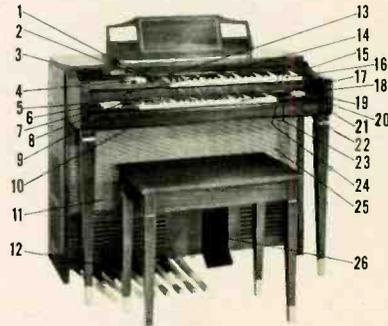
April Issue, High Fidelity Magazine

"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. Lockett, 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**



# World's Lowest-Cost 2-Keyboard Transistor Organ...The Heathkit®/ Thomas "Artiste" ART-1...Priced To Save You Up To 30%

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



GD-232B  
**\$332<sup>00</sup>**  
(less bench)

## Acclaimed By Thousands For Its Professional Features And Ease Of Assembly!

- 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
- Transistorized plug-in tone generators, the heart of the organ . . . warranted for 5 years
- Handcrafted, hand-rubbed walnut cabinet . . . completely assembled

**MAKE YOUR OWN FUN!** Right in your own home. It's easy . . . with the Heathkit GD-232B. Easy to build . . . easy to play. It's like getting two hobbies for the price of one. And think of the fun of playing this beautiful instrument in your home! Great for livening up parties . . . song fests . . . background music . . . dancing. Helps you relax after a hard day. And teens will love the rhythm and bounce of its many musical effects. Ten true organ voices in all. Trombone, reed, flute, oboe, coronet, violin, saxophone, horn, viola, and diapason. All at the simple touch of a tab. Features include repeat percussion to create additional banjo and mandolin effects; 13-note heel and toe bass pedals; variable expression pedal to change the volume; two levels of vibrato intensity; variable bass pedal volume; plus many more professional features as outlined in the diagram at right.

**IT'S EASY TO LEARN HOW TO PLAY, TOO!** In fact, the organ is one of the easiest instruments to play. Excellent for giving both youngsters and grownups a knowledge and appreciation of music. A complete set of self-teacher records is available at a \$30 savings.

**NO SPECIAL SKILLS OR KNOWLEDGE ARE NEEDED TO BUILD IT!** Probably more inexperienced kit builders have assembled this low cost Heathkit/Thomas organ than any other kit we produce. Includes simple, step-by-step instructions . . . genuine Thomas factory-fabricated components . . . factory assembled, hand-rubbed walnut cabinet that's ready for the sub-assemblies as you complete them (measures a compact 41¼" H x 39¾" W x 21½" D) . . . diagrammed, easy-to-wire circuit boards. You even tune the organ with the pre-tuned tone generators . . . no "musical" ear needed. About 50 hours are required to assemble the entire organ . . . makes an ideal family project.

**5-YEAR WARRANTY ON TRANSISTORIZED, PLUG-IN TONE GENERATORS!** The heart of the organ! Assure clear, undistorted tone, long life, and virtually eliminate service and tuning problems. Heathkit organ owner George J. Agamemnon, Burlington, N.C. summed up the GD-232B's performance when he wrote: "I am most pleased with the final product. It plays beautifully and my family is enjoying it immeasurably. It is a credit to your engineering staff. In addition, the assembly instructions are very clear and easy to follow, which makes the assembly task enjoyable and simple."

Kit GD-232B, Organ, 153 lbs. . . \$34 dn., \$28 mo. . . . . **\$332.00**  
GDA-232-1, matching walnut bench, 18 lbs. No money dn., \$5 mo. . . **\$24.95**  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**COMPLETE SELF-TEACHER RECORDED LESSONS . . . ONLY \$19.95!** Can't play a note? Learn quickly and easily at your leisure with this complete 48 lesson course on four 12" LP records. Includes music book with many old-time favorites. Provides a firm basis of musical knowledge. Save \$30.05!

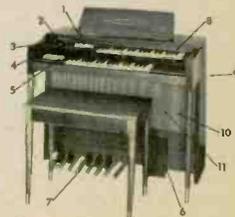
GDA-232-2, lessons, 5 lbs., Mfrs. list \$50 . . . . . **\$19.95**

**LIKE TO HEAR IT PERFORM?** Then send 50c to cover postage and handling and ask for the 7"-33⅓ rpm demo record no. GDA-232-5. You'll convince yourself!

### Selection Of Thomas Organ Music Books—See pg. 11

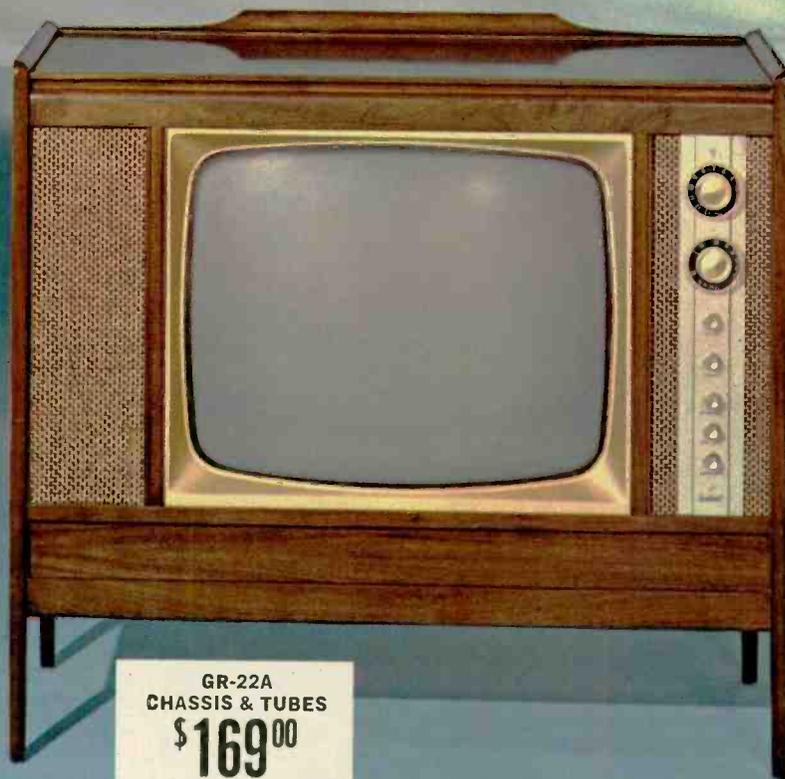
#### Compare These Professional Features!

1. 10 True organ voices; trombone, reed, flute, oboe, cornet, violin, saxophone, horn, viola, diapason  
2. Variable Repeat Percussion; produces banjo, 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 • Transistorized for longer life, better tone, trouble-free operation.



# Deluxe Hi-Fi Black & White 23" All-Channel TV!

• UHF & VHF in one unit for all-channel (2-83) reception • 16 tube, 5 diode circuit gives 30 tube performance • High definition 23" 90° tube with anti-glare bonded safety glass • Spark-gap socket for picture tube protection • Deluxe Nuvistor 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

**\$169<sup>00</sup>**

(less cabinet & speaker)

## Covers All Channels To Provide Needle-Sharp High Fidelity Picture & Sound

### ... Ideal For Custom Or Cabinet Installation!

THINKING ABOUT REPLACING THAT OLD TV SET? Then consider the GR-22A Heathkit All-Channel 23" 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." And now you can enjoy this same praise-winning set at a new low price... only \$169.00!

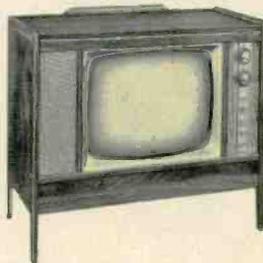
**GOES FROM PARTS TO PICTURE IN JUST 12 HOURS!** And no special skills or knowledge are required. All critical circuits (tuner, I.F. strip, and high voltage sections) are factory built and aligned, ready to install. You simply mount the sub-assemblies & controls, wire a non-critical circuit board, connect 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 & 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" 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 this set, and you're able to make repairs or adjustments yourself should it ever become necessary. No more costly TV service repair bills!

**ENJOY HIGH FIDELITY TV... CHOOSE THE GR-22A!** Top quality, heavy-duty parts; advanced circuitry; and famous "Heath-Engineering" have made this superb performance possible. Again quoting *High Fidelity* magazine: "In view of its performance, ease of construction, adaptability for installation, and cost, we regard the GR-22 as a significant development in electronic kits, one of which Heath may well be proud." Kit GR-22A, chassis & tubes, 77 lbs... no money down, \$16 mo. \$169.00

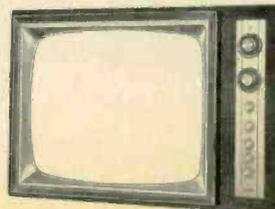
**GR-22A SPECIFICATIONS**—Picture size: 23" overall diagonal, approximately 282 sq. in. Deflection: Magnetic, 90°. Focus: Electrostatic. Antenna input impedance: 300 ohm balanced. Tuning range: VHF TV Channels 2-13 & UHF Channels 14-83. Picture IF carrier frequency: 45.75 mc. Sound IF carrier frequency: 41.25 mc. Sound IF: 4.5 mc. Video response: to 3.2 mc. Tube complement: 6DS4 Nuvistor RF Amp; 6CG8A Osc. & converter; transistor UHF tuner; 6BZ6 1st IF; 6GM6 2nd IF; 6EW6 3rd IF; 6HF8 Video amp & sound IF; 6GX6 Sound detector & 1st audio; 6GWB sound output & cathode follower; 6HS8 sync & AGC; 6EW7 vertical osc. & output; 6FQ7 horizontal osc.; 6GW6 horizontal output; 6CQ4 damper; 1B3/1G3 high volt. rect.; 5U4GB low volt. rec.; 5U4GB low volt. rec.; 23BWP4 picture tube. Diodes: (2) 1N295 video detector & DC restorer; Dual selenium horizontal AFC; 1N82A-UHF Mixer. **Sound cathode follower:** Output impedance, 3 k ohm. Frequency response, ±1 db 50-15,000 cps; Harmonic distortion, less than 1%. Output Voltage 2V. **Audio output:** Output Impedance, 8 ohms, Output Power, 2 watts. Frequency response ±2 db 50-15,000 cps. Harmonic distortion, less than 3%. Power requirements: 105 V to 125 V. 60 cycles AC, 210 watts. Size required for mounting: 19" H x 29 1/8" W x 17" D.



### Deluxe TV Cabinet!

Completely assembled and handsomely styled in rich modern walnut to match Heathkit Hi-Fi cabinets, pg. 42. Includes mask, chassis mounting board, and 6" x 9" hi-fi speaker... ready for chassis installation. Measures 36" W x 32 3/8" H x 20 1/2" D.  
GRA-22-1, Walnut TV cabinet, 65 lbs... no money dn., \$9 mo. .... \$84.95  
GR-52A, TV set & walnut cabinet, 142 lbs.... Save \$8.95, no money dn., \$23 mo... \$245.00

### Custom TV Wall Mount Mask!



Unfinished, ready for the finish of your choice. Includes 3/4" chassis mounting board. Cut & drilled to accept GR-22A chassis & tube. Size: 20 3/8" H x 30 3/8" W x 1 1/8" D. Required mounting space dimensions: 19" H x 17 3/4" D x 28 1/8" W.  
GRA-22-5, TV wall mount, 13 lbs. .... \$23.50  
GR-62B, TV set with wall mount, 90 lbs... Save \$7.50... no money dn., \$18 mo. .... \$185.00



**NEW! Deluxe Heathkit® 25" Color TV...\$469<sup>95</sup>!**



**The Only 25" Color TV You Can Install Any One Of 3 Ways!**

1. In A Wall
2. In Your Own Custom Cabinet
3. In Heath Factory-Built Cabinet

**Economy Cabinet . . . \$59.95**  
 Low in price, high in quality! Constructed of fine walnut veneers & solids with an oil-rubbed walnut finish. GR-25 speaker & convergence panel mounts behind till-out grille cloth on right side of cabinet front. Measures a slim 19" D x 31" H x 32" W. A terrific buy at its low \$59.95 price!  
 Assembled GRA-25- . . . , 35 lbs. . .  
 no money dn., \$6 mo. . . . . \$59.95

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

# Here's The 25" Color TV You Asked For! Has All The Features Of Famous Heathkit® 21" Color Set, Plus New 25" Rectangular Tube And Many Innovations To Provide The Finest Color TV At Any Price! Compare . . . Price—Features—Performance—Quality!

- Hi-fi 90° rectangular 25" color tube with anti-glare safety glass and "rare earth" phosphor for better "reds," brighter pictures
- 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

## New Rectangular 25" Color TV Takes Up Less Space, Yet Provides More Picture!

Here it is . . . in answer to your many letters . . . the new Heathkit 25" Color TV with a full 295 square inches of viewing area. And yet it requires less space for wall or cabinet installation, thanks to its rectangular tube design & 90° deflection.

## Many New High Performance Features!

You'll find many innovations in this new set, as well as all the self-maintenance and convenience features of the Heathkit GR-53A. Compare it with any other commercial set on the market. It's your best color TV buy—bar none!

**HI-FI 90° RECTANGULAR 25" COLOR TUBE!** In addition to its larger viewing area and smaller space needs, it has a "rare earth" phosphor for more realistic red tones and brighter pictures. Plus anti-glare safety glass to protect its face.

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

**EXCLUSIVE HEATH MAGNA-SHIELD!** Shields the entire tube from external magnetic fields, thus improving color purity.

**EXTRA B+ BOOST!** Accelerates the electronic beams for a smaller spot size. Result? Higher resolution, improved definition and brighter pictures.

**DYNAMIC PINCUSHIONING CORRECTION CIRCUIT!** Keeps the edges straight for a full picture with no distortion.

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

**DELUXE VHF TURRET TUNER!** With "memory" fine tuning that remembers so you don't have to readjust when you return to a channel. Also features long-life nickel silver contacts for positive switch action.

**NEW 3-STAGE IF STRIP!** Reduces interference and improves reception.

**NEW VERTICAL SWING-OUT CHASSIS!** Hinged to make it more accessible for easier construction, care and installation. (See illust. right.)

**TWO VHF ANTENNA INPUTS!** Choice of either a 300 ohm balanced, or a 75 ohm coax input to reduce color interference in metropolitan and CATV areas.

**FRONT-PANEL TILT-OUT CONVERGENCE CONTROLS!** Lower right speaker grille in cabinets tilts out to make dynamic convergence easier. No more reaching around the set or mirrors to set up.

**MAIN CONTROL PANEL!** All tuning controls mount on universal panel for truly versatile custom installation . . . mounts above, below or to the right of the picture tube . . . wherever you prefer.

**HI-FI SOUND OUTPUTS!** Accommodates the special limited-field 6" x 9" speaker. Also has a cathode follower output to drive a hi-fi system.

**AUTOMATIC COLOR CONTROL CIRCUIT!** Reduces color fading . . . you always have the best possible picture.

**GATED AUTOMATIC GAIN CONTROL!** Provides steady, flutter-free pictures even under adverse interference such as nearby airplane traffic.

**BUILT-IN SERVICING FACILITIES!** An exclusive Heath feature! Includes dot generator and mobile degaussing coil for initial set up, and to converge and maintain the set at any time. Manual includes full-color illustrations that show you exactly what to look for, and how to achieve it . . . quickly and easily. Eliminates costly color TV service calls for simple picture adjustments.

In addition you enjoy features like lighted channel indicators; 25,000 volt picture power for a clear, sharp picture; transformer-operated 27-tube, 10-diode circuit; and circuit breaker protection.

## Assembles Easily In Just 25 Hours!

All critical circuits . . . VHF & UHF tuners, IF strip and high voltage sections . . . are preassembled and tested. You simply wire 3 circuit boards, assemble the parts on the chassis, connect the units together with a wiring harness, and adjust the picture.

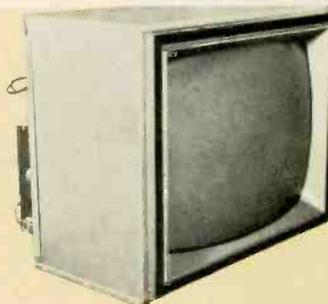
## 3-Way Installation!

You can install the GR-25 in a wall or custom cabinet. Required dimensions: 20" D x 21" H x 26" W. Or choose the factory-assembled and finished Heath cabinet (see opposite pg.).

Kit GR-25, all parts including chassis, tubes, mask, UHF & VHF tuners, mounting kit and special extended-range 6" x 9" speaker, 115 lbs. . . \$47 dn., as low as \$29 mo. . . . . \$469.95

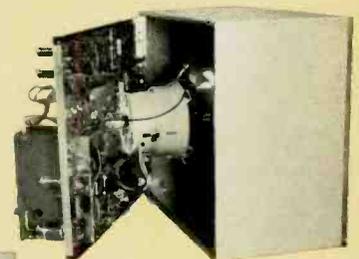
Assembled GRA-25-I, low cost walnut cabinet, 35 lbs. . . no money dn., \$6 mo. . . . . \$59.95

**GR-25 SPECIFICATIONS**—Picture size: 25", rectangular, approx. 295 sq. inches. Deflection: Magnetic 90°. Focus: Electrostatic. Convergence: Magnetic. Antenna input impedance: 300 ohm balanced, or 75 ohm unbalanced (VHF). Picture IF carrier frequency: 45.75 mc. Sound IF carrier frequency: 41.25 mc. Color subcarrier: 42.17 mc. Video IF bandpass: 3.58 mc. Sound IF frequency: 4.5 mc. Tuning range: VHF channels 2-13, UHF channels 14-82. Tube complement: 6AH5 RF amp.; 6GX7 mixer; 6JH6 1st IF; 6GM6 2nd IF; 6EJ7 3rd IF; (4) 6GH8 sound & sync amp., color amp & video cathode follower, bandpass amp. & color killer, 3.58 osc. & reactance; 6GX6 sound det. & 1st audio; 6GW8 sound output; 6HS8 sync & AGC; 6GF7 vertical output; 12GN7 video output; 6JU8 color killer det., ACC & Phase det.; (2) 6GY6 X demodulator, Z demodulator; (3) 6FQ7 B-Y amp. & blanking, R-Y & G-Y amp., horizontal osc.; 6JE6 horiz. output; 6DW4 damper; 6BK4 hi-voltage regulator; 3A3 hi-voltage rect.; 1V2 focus rect.; 25" color picture tube. Diodes: (3) 1N295 video det., sound & sync det. & dot generator, dual selenium horiz. AFC; convergence; 4 silicon power; 1N82 UHF mixer; Trans. UHF osc. Sound cathode follower: Output impedance; 3 K. Frequency response; ±1 db, 50-15,000 cps. 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 cps. Harmonic distortion, less than 3%. Power requirements: 110-130 v., 60 cycle AC, 330 watts. Wall mounting: 20" D x 21" H x 26" W inside. Control panel, 6" x 7" x 7".

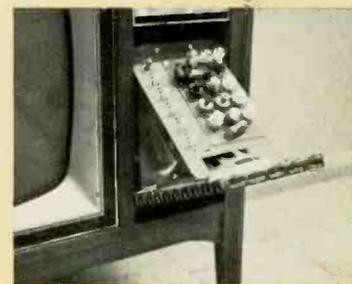


**Vertical Swing-Out Chassis!** Makes chassis more accessible for servicing and installation.

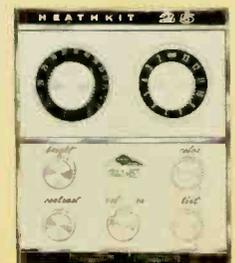
**Exclusive Heath Magna-Shield!** . . . keeps out external magnetic fields and improves color purity by covering entire tube.



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



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



# Regardless Of What You Pay For Another 21" Color TV, It Can't Perform As Well As This One . . . The Heathkit®GR-53A Has Exclusive High Performance Features . . . Assembles In 25 Hours . . . And Saves Up To 30%!

• 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

## You Can't Buy A Better 21" Color TV!

No matter how many of your hard-earned dollars you pay for another 21" color TV, none can equal the performance of the Heathkit All-Channel, High Fidelity Color TV! Why? All color sets require minor periodic adjustments to maintain peak picture performance. The Heathkit GR-53A is the *only* 21" color set with a "built-in service center" that provides facilities for perfect picture adjustments. Heath's 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? Beautiful, true-to-life pictures day in and day out. And no costly color TV service calls for simple picture adjustment.

## Compare These Features With Any Other 21" Color TV!

**BUILT-IN DOT GENERATOR!** Allows you to adjust set yourself. Just flip the service switch for the "dot" pattern, and adjust controls for a sharp, clear picture.

**CONVERGENCE CONTROL CENTER!** Use in conjunction with the "dot" generator to keep the set perfectly converged for the finest picture at all times. No more color fringing or overlap. No service calls everytime you move the set.

**EXCLUSIVE MOBILE DEGAUSSER!** Just connect the degaussing coil to the terminals on the back of the set, and demagnetize whenever you decide color purity needs it. This simple device is movable . . . functions in any area of the picture or chassis to "clean" the picture.

**DELUXE TUNERS!** Turret-type with Nuvistor front-end for low noise, and push-to-fine-tune that "remembers" . . . no need to readjust each time you return to a channel. Gold contacts are used for positive switch action and long life.

**BONDED FACE, ETCHED SAFETY GLASS!** Insures your safety, provides glare-proof, reflection-free pictures. Adds convenience, too . . . no dust-catching flat glass.

**TONE CONTROL & TWO HI-FI SOUND OUTPUTS!** One output to drive set's speaker, and the other with stereo/hi-fi amplifier if you wish. Features wideband FM circuits that deliver full fidelity with virtually no distortion.

**WORLD'S MOST ELABORATE CONSTRUCTION MANUAL!** 138 pages that make you an expert. (see Popular Science editor Hubert Lockett's comments opposite). As one GR-53A owner put it "the manual is worth a lifetime of warranties on ordinary sets."

## Goes Together Quickly, Easily!

Both tuners, horizontal output & high voltage circuits, I.F. amplifiers, and sound detector are factory assembled & tested to give you a "head start". You simply build 3 circuit boards, mount the parts, connect the color-coded wiring harness, and adjust the picture. From parts to picture in just 25 hours.

## Acclaimed By Experts!

**POPULAR ELECTRONICS:** "The GR-53A is not a skimpy receiver in which corners have been cut to keep costs down and still provide color TV. Instead, the GR-53A (on a comparison shopping basis) has the same color and sound fidelity, flexibility and ease of handling as those manufactured sets which sell for over \$600."

**POPULAR MECHANICS:** "Mounted, prealigned circuits enable beginners to assemble. Picture quality is top-notch."

**POPULAR SCIENCE, HUBERT LUCKETT:** "The manual provided with the kit is a masterpiece. It is nearly a half-inch thick and lavishly illustrated with drawings, photographs, X-ray views of circuit boards, and even 32 full-color pictures. Only 28 pages of the 138-page manual are devoted to the usual step-by-step procedures. The rest covers the theory of operation, detailed descriptions of each circuit, trouble-shooting, service information, adjustments, and operation."

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

## Acclaimed by Owners!

**TV SERVICEMAN, E. C. VAN DYKE, BALTIMORE, MD.:** "After constructing Kit #GR-53A, I can truthfully say I have never seen a color TV look so good."

**MR. HENRY OLESKI, TRUMBULL, CONN.:** "Prior to purchasing your kit I scouted around the local dealers, TV establishments, comparing known set features, styling & prices. You have my word I have not seen one unit under the \$700 bracket that compares to all around styling, performance and simplicity of operation."

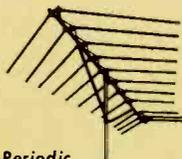
**MRS. JOSEPH GESSWEIN, BETHESDA, MD.:** "If a housewife with 3 children under 4 years old can successfully build it in her few spare moments, it has to be good."

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

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. . . . \$375.00  
Assembled GRA-53-7, walnut wood cabinet, 82 lbs. . . No money down, \$11 mo. . . . \$108.00  
Assembled GRA-53-6, walnut finished hardboard cabinet, 51 lbs. . . No money down, \$5 mo. . . . \$46.50

**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 mc. Sound IF carrier frequency: 41.25 mc. Color sub-carrier: 42.17 mc. Sound IF frequency: 4.5 mc. Tuning range: VHF TV Channels 2-13, UHF 14-83. Sound cathode follower: Output impedance: 3K. Frequency response: ±1 db, 50-15,000 cps. 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 cps. Harmonic distortion: Less than 3%. Power requirements: 110 V to 130 V, 60 cycle AC, 300 watts. Wall mounting space required: 23 1/4" D x 22 1/4" H x 28" W.



**JFD Log-Periodic LPV-11 VHF TV Antenna!**

Receives color, B & W TV (channels 2 thru 13), FM Stereo up to 125 miles away! Patented geometric concept for higher forward gain, sharper directivity, lower VSWR—down to 1.2 to 1, a front-to-back ratio of 35 db, Gold Bond Anodized finish. 11 V-elements! GDP-124, 15 lbs. . . . Mfrs. list \$39.95 . . . . . Only \$23.45



**New! Alliance Tenna-Rotor . . . Save \$16.50**

New patented 5-wire bridge type circuit . . . unaffected by motor current, cable length or line voltage variations. Expanded meter scale. Rotates 360 either direction—instantly reversible. Magnetic brake. Lubricated for life. Moisture sealed. 115v AC, 60 cycle. GDP-214, 11 lbs. . . . \$23.45



**Performance-Proven Transistorized Blunder-Tongue FM/TV Booster (IT-4) For Fringe Areas**

Dependable, trouble-free signal booster. Accepts up to four FM and TV sets simultaneously. 300 ohm input & output. Easy to install. 1 1/2" x 2 3/4" x 4". GDP-331, 1 lb. . . . Only \$19.40



**Taco 4-Bay Model 3044 TV Bow-Tie UHF Antenna**

Popular open vee type with pivot mount for rigid locking to existing mast; heavy mesh screen reflector of galvanized 12 gauge steel with 1" x 1 1/2" squares for max. stability and long life. GDP-233, 5 lbs. . . . Mfrs. list \$8.75 Net . . . . . \$5.14

# Deluxe 21" Color TV...With High Fidelity Picture & Sound!



Your Best  
21" Color TV Buy!  
GR-53A  
Saves On Maintenance  
Performs With  
The Finest  
**\$375**  
(less optional cabinets)



**Deluxe Cabinet . . . \$108.00**

Finest in TV furniture! Matches Heath contemporary hi-fi cabinets, pg. 42. Fits within 3" of wall. Quality crafted of 3/4" walnut solids and veneers with a hand-rubbed finish. Includes special hi-fi 6.8 oz. mag. 6" x 9" speaker to give you 2-speaker performance with GR-53A chassis (speakers mount behind grille cloth). Size: 44" W x 32 3/8" H x 23 5/8" D (26 1/2" D. including tube rear cover).

Assembled GRA-53-7, 82 lbs. . No money down, \$11 mo. . . . \$108.00

## Install Any Of 3 Ways!

1. In A Wall
2. In Your Own Custom Cabinet
3. In Either Heath Factory-Built Cabinet



**Economy Cabinet . . . \$46.50**

Handsome, yet low in cost. Constructed of walnut-finished wood and hardboard; tubular wood legs with brass finish ferrules and glides. Speaker included with GR-53A mounts behind grille cloth on left side of cabinet. Cabinet size: 37 3/4" W x 33 1/4" H x 26 1/4" D.

Assembled GRA-53-6, 51 lbs. . . No money down, \$5 mo. . . . \$46.50

STEREO HI-FI



## Deluxe All-Transistor Stereo Twins... For the Audio

Everything Sounds "Naturally" Better On This  
Transistor AM/FM/FM Stereo Tuner!

AJ-43D **\$109<sup>00</sup>**  
(less cabinet)

- 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

**REALISTIC SOUND AT A REALISTIC PRICE!** That's the Heathkit AJ-43D. It offers the clean, natural sound and instant, heat-free operation of solid-state circuitry; complete operating features; versatility of installation; plus a price that's far below comparable quality models. But don't take our word for it. Take the word of AJ-43D owners like Mr. Frank Burris, Yucaipa, Calif.: ". . . I am more pleased with its general performance than any other transistor (or tube) tuner which I have seen on the American market, kit or factory assembled." Or respected hi-fi editors like Julian D. Hirsch, who in *Hi Fi/Stereo Review* wrote: "The AJ-43 is an excellent tuner, and holds its own with any other tuner of comparative ratings. I appreciated being able to stack the AJ-43 on top of the AA-21 amplifier, and run them for hours without either one becoming perceptibly warm."

**NOW COMPARE ITS HIGH PERFORMANCE FEATURES!** In addition to those listed above, there's automatic switching to stereo. Automatic stereo indicator light. And an Automatic Frequency Control to assure positive tuning . . . emitter-follower output stages that eliminate high frequency cable losses . . . lighted slide-rule dial plus heavy flywheels for easy, accurate tuning . . . transformer-operated power supply with silicon diode rectifiers for long life, dependability and freedom from heat . . . and a unique "push-push" switch to turn the unit on or off.

**SIMPLE TO BUILD, TOO!** With the factory-built and aligned front-end and 4-stage FM I.F. circuit board, plus fast circuit board construction. Takes no special skills or knowledge.

Kit AJ-43D, 15 lbs...less cab. for custom mtg.  
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 (Monaural Only):** Tuning range: 88 to 108 mc. Intermediate frequency: 10.7 mc. Antenna: 300 ohms balanced, internal line antenna provided. Quieting sensitivity: (400 cps, 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 kc at 6 db down, 1000 uv input. Detector bandwidth (Peak-to-Peak): 600 kc. Harmonic distortion: Less than 1% (IHF). Hum & noise: (Complete tuner) 55 db below full quieting (IHF). Output impedance: (Emitter Follower) Variable to 3000 ohms. Output voltage: 1 V. @ 1000 uv, 400 cps 100% mod. **FM STEREO CONVERTER SECTION:** Converter bandpass: 50 cps to 53,000 cps, ± 1/4 db. Channel separation: 40 db @ 50 cps to 2,000 cps; 30 db @ 10,000 cps; 20 db @ 15,000 cps. 19 KC suppression: 50 db down. 38 KC suppression: 45 db down. SCA rejection: 30 db min. 64 kc to 70 kc. Hum & noise: 55 db down. Output voltage: 1 V. @ 100 uv input, 400 cps, 100% mod. Output Impedance: (Emitter Follower) Variable to 3000 ohms each channel. **AM SECTION:** Tuning range: 535 to 1620 kc. Intermediate frequency (IF): 455 kc. Sensitivity: 600 kc, 7 uv for 10 db S/N; 1000 kc, 4 uv for 10 db S/N; 1400 kc, 3 uv for 10 db S/N. Antenna: Built-in rod with provisions for external straight wire. Image rejection: 50 db at 600 kc; 70 db at 1400 kc. IF rejection: 55 db at 600 kc; 65 db at 1400 kc. 10 KC 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 1/4" 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 (illus. above) for AJ-43D. Ideal for open component installation on bookshelf or hi-fi cabinetry. Model AE-11 . . . . . \$12.95

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



With Metal Cabinet

Heathkit Performance Specifications Are Guaranteed



## While With An Eye As Discriminating As His Ear!

Matching Deluxe 100-Watt Transistor Stereo Amplifier . . .

Easily Handles Any Program Source, Easily Drives Any Speaker!

**\$137<sup>00</sup>**  
AA-21D  
(less cabinet)

- 26-transistor, 10-diode circuitry for smooth, uncompromising power response . . . 13 to 25,000 cps  $\pm 1$  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

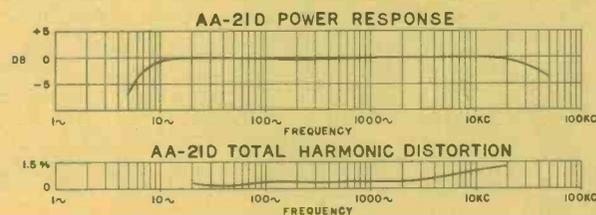
**INSTANTANEOUS BURSTS OF POWER AS THE MUSIC DEMANDS!** Clean, uncompromising "solid" power with no faltering at the high or low ends of the response range. A full 100 watts IHF music power. Add cool, instant, hum-free operation. And long, unchanging life. Characteristics not obtainable in tube-types. This is the performance of the Heathkit AA-21D. And how does the AA-21D stack up against other comparable models? *Electronics Illustrated* magazine said: "The sound from the AA-21 is quite startling. Compared to tube amplifiers, the most noticeable difference is the clarity and crispness of reproduction of transients. In terms of measured specs the AA-21 performs as well, and in most cases better, than claimed by Heath." AA-21 owner Mr. James S. Caddell, Ft. Worth, Texas wrote: "The engineering, assembly and finish of the AA-21 produces a professional job. The real treat comes from the finished product—the excellent sound."

**FINGERTIP CONTROLS OFFER FULL OPERATING CONVENIENCE!** All are front-panel mounted. Include a 5-position dual-concentric source switch, 5-position mode switch, and dual-concentric volume, bass and treble controls. There are input and output connections to handle any program source, and 4, 8 and 16 ohm speaker impedances. A transformerless output circuit and multiple feedback loops assure fine fidelity and low distortion levels. And circuit safety is assured by 5 bi-metal circuit breakers . . . no fuses to replace!

**QUICK AND EASY TO ASSEMBLE!** With prewired and sealed, epoxy-covered preamplifier circuit modules and circuit board construction. Choose both AJ-43D tuner and AA-21D amplifier for complete stereo!

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 cps; 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**—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 kc. Frequency response:  $\pm 1$  db from 13 cps to 25 kc @ rated output;  $\pm 3$  db from 8 cps to 40 kc @ rated output. Harmonic distortion (At rated output): Less than 1% @ 20 cps, 0.5% @ 1 kc, 2.0% @ 20 kc. Intermodulation distortion (At rated output): Less than 1%, 60 & 6,000 cps 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 kc, 55 db min. @ 1 kc, 50 db min. @ 20 cps. 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, & 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 cycles 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!



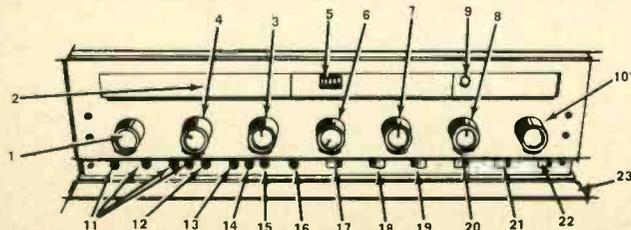
With Metal Cabinet

Less cabinet for custom mounting in a wall or panel. Kit AA-21D . . . . . \$137.00  
Luxurious walnut wood cabinet (illus. 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 (illus. opposite) with polished aluminum trim for AA-21D. Model AE-15 . . . . . \$6.95

STEREO HI-FI

World's Best Transistor Stereo Receiver Buy  
...The Heathkit® AR-13A  
...Just Add 2 Speakers And Enjoy!

AR-13A  
\$184<sup>00</sup>



**All Controls Front-Panel Mounted ... Easy To Reach!**

For simple finger-tip operation, the major controls are: 1. AM Tuning 2. Illuminated Slide-Rule Tuning Dials 3. Source Selector 4. Mode Selector 5. Tuning Meter 6. Volume Control 7. Bass Control 8. Treble Control 9. Automatic Stereo Indicator Light 10. FM Tuning.

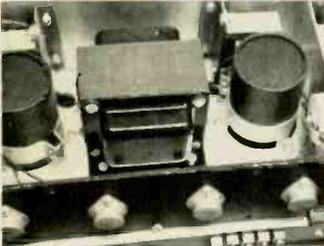
The secondary controls which are protected by the hinged lower front panel from accidental system setting changes are: 11. Input Level Controls 12. Phase Adjust Control 13. Converter Balance Control 14. Stereo Separation Control 15. FM Squelch Control 16. Level Balance Control 17. Phase Adjust Switch 18. AFC Switch 19. Local-Distance Switch 20. SCA Filter Switch 21. Noise Filter Switch 22. Speaker Phase Switch 23. Hinged Lower Front Panel.

*“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”*

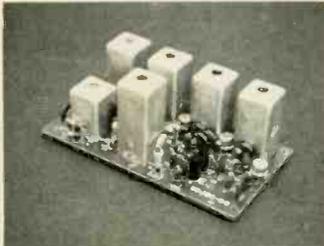
RADIO-TV EXPERIMENTER MAGAZINE



**Automatically Switches to Stereo!**  
Stereo signal is automatically routed through built-in stereo adapter . . . eliminates manual operation. At the same time a stereo indicator lights automatically.



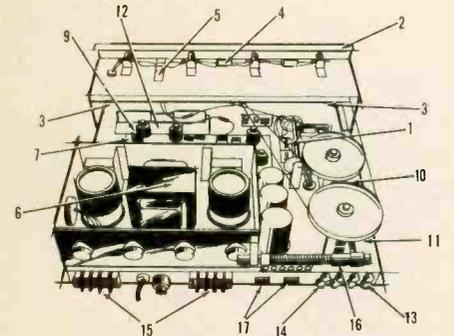
**Big Transformer Power Supply**  
Provides efficient operation . . . delivers full power over the entire rated 15 to 30,000 cps frequency range!



**Preassembled, Prealigned AM-FM I.F. Strip & “Front-End”!**  
Already accomplished at the factory to assure you of top performance . . . simplifies construction, simply mount in place & proceed to other steps!



**Tuning Meter!**  
Allows precision tuning of both AM & FM bands.



**The Latest “Solid-State” Circuitry & Features!**  
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 (not shown) 9. 19 kc and 38 kc output filter 10. Pre-assembled, prealigned FM front end 11. AM RF amplifier stage 12. Circuit modules 13. Three stereo inputs 14. Low impedance tape recorder outputs 15. Transformerless 4, 8, and 16 ohm outputs 16. AM rod antenna 17. Switched and unswitched line outputs.

• 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 cps • Luxurious walnut cabinet styled in Heathkit low-silhouette motif • Preassembled, prealigned “front-end” and AM-FM I.F. strip aid construction

**THE BEAUTY OF TRANSISTOR SOUND!** Crisp, clean sound with a sharp instant response that never falters. Fully reproduces the impact of a kettle drum . . . each chord struck fortissimo on a piano . . . or the swelling sonorities of an entire orchestra. You hear each note . . . each voice . . . each instrument just as if you were right there at the recording session. Pure, natural and transparent. That’s transistor sound. That’s the sound of the Heathkit AR-13A All-Transistor Stereo Receiver.

**BUT TRANSISTORS GIVE YOU MORE!** Like cool, instant performance that’s free from heat. And long, dependable life, since transistors don’t deteriorate. And more economical operation since they consume less power. Characteristics unobtainable in tube-types.

**PLENTY OF POWER FOR ANY MUSIC SYSTEM!** 66 watts of pure, uncompromising music power, 40 watts continuous at ± 1 db from 15 to 30,000 cps. And the transformer power supply insures full power at each frequency.

**ADVANCED FEATURES FOR OPERATING CONVENIENCE!** Automatically switches to stereo, and a stereo indicator automatically 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. 3 stereo inputs—mag. phono & two auxiliary. A separate control for balancing both channels. The AM tuner features a high gain RF stage & High-Q rod antenna. And the FM

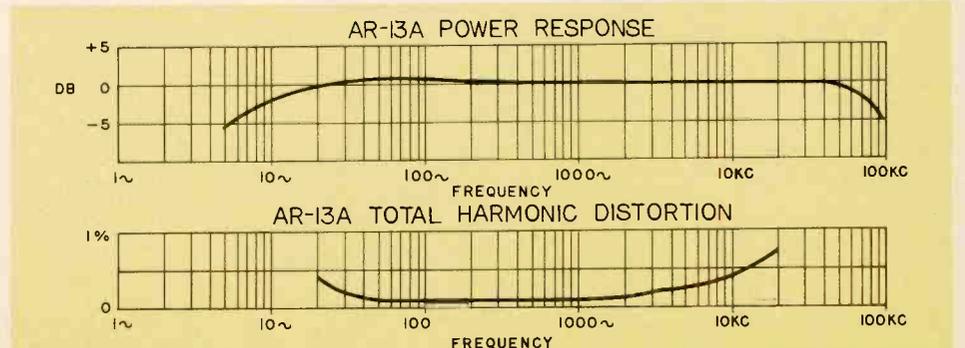
**Important: The AR-13A is exempt from any Special System Discount.**

tuner has a built-in line-cord antenna for strong signal pickup. A local-distance switch prevents overloading in strong signal areas. An automatic frequency control assures positive tuning. And a flywheel tuning meter, and lighted AM & FM slide-rule dials permit accurate tuning. Also has external antenna connections.

**CONCEALED SECONDARY CONTROLS!** Conveniently placed & protected under the hinged lower front panel to prevent accidental system setting changes. And the sleek walnut cabinet with extruded gold-anodized aluminum front panel harmonizes with any surroundings.

**Kit AR-13A, 35 lbs. . . .**  
No money down, \$18 mo. . . . . **\$184.00**  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**AR-13A SPECIFICATIONS—Recommended system mates:**  
Speaker systems: AS-10 or AS-51, pg. 26; separate speaker: AS-183, pg. 23; all changers, pg. 24-25.  
**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 kc. **Frequency response:** ±1 db from 15 cps to 30 kc @ rated output; ±3 db from 10 cps to 60 kc @ rated output. **Harmonic distortion (at rated output):** Less than 1% @ 20 cps; less than 0.3% @ 1 kc; less than 1% @ 20 kc. **Intermodulation distortion (at rated output):** Less than 1%, 60 & 6,000 cps 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 kc, 60 db @ 1 kc, 40 db @ 20 cps. **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 mc to 108 mc. **IF frequency:** 10.7 mc. **Frequency response:** ±3 db, 20 to 15,000 cps. **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 kc @ 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:** ± 1/2 db, 50 to 53,000 cps. **Channel separation:** (SCA Filter Off) 30 db, 50 to 2,000 cps; 25 db at 10 kc. **19 KC 38 KC Suppression:** 45 db down from rated output at 1 kc. **SCA Rejection:** 35 db down from rated output. **AM Tuning range:** 535 to 1620 kc. **IF frequency:** 455 kc. **Sensitivity:** 30 uv @ 600 kc; 9 uv @ 1000 kc. **Bandwidth:** 8 kc @ 6 db down. **Image rejection:** 40 db @ 600 kc. **IF rejection:** 55 db @ 1000 kc. **Harmonic distortion:** Less than 2% with 1000 uv input; 400 cps with 30% modulation. **Hum & noise:** 40 db. **Overall dimensions:** 17" L x 5 1/2" H x 14 1/4" D. **Power requirements:** 105-125 volts, 50-60 cps AC, 30 watts idling, 110 watts max.



# 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. 19, 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 component *not* eligible for discount is the AR-13A stereo receiver, pg. 20.

**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 \$14.41!**



ADP-124 Garrard Model 50 Stereo Record Changer with choice of 1c cartridge, pg. 36, \$44.51 plus ADA-53W walnut base, \$4.95

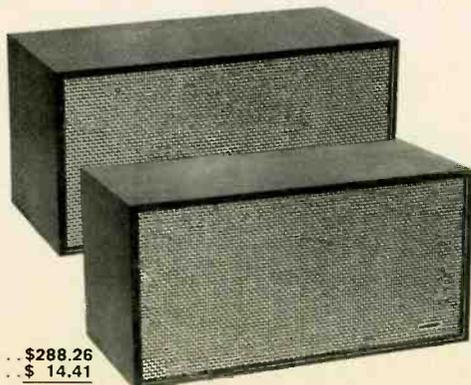
Heathkit AJ-32 AM/FM Stereo Tuner, pg. 28, \$84.95



Heathkit AA-151 32-Watt Stereo Amplifier, pg. 28, \$59.95



Heathkit A5-51W 2-Way Speaker Systems in walnut cabinets, pg. 38, \$46.95 each



Complete System Kit HF5-74  
Reg. . . . . \$288.26  
Save 5% . . . . . \$ 14.41  
You Pay only . . . . . \$273.85

**Save \$8.82 On This Low-Cost Stereo System!**



ADP-124 Garrard Model 50 Stereo Record Changer with choice of 1c cartridge, pg. 36, \$44.51, plus ADA-53W walnut base, \$4.95

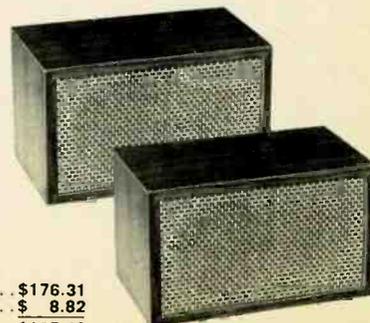
Heathkit AJ-13 FM/FM Stereo Tuner, pg. 30, \$47.00



Heathkit AA-32 20-Watt Stereo Amplifier, pg. 30, \$39.95



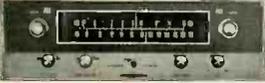
Heathkit A5-81W Hi-Fi Speaker Systems, in walnut cabinets, pg. 38, \$19.95 each



Complete System Kit HF5-71  
Reg. . . . . \$176.31  
Save 5% . . . . . \$ 8.82  
You Pay Only . . . . . \$167.49

# 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	TUNERS AND AMPLIFIERS	SPEAKER SYSTEMS OR SPEAKERS <sup>2</sup> (ORDER 2 FOR STEREO)		
<b>TOP OF THE LINE STEREO</b>				
	 <b>AJ-43D AM, FM STEREO TUNER</b>	 <b>AA-21D AMPLIFIER</b>	AS-21 or AS-2A or AS-2	AS-183 or AS-173
ADP-24 ADP-25 ADP-94 ADP-104	 <b>AJ-33A AM, FM STEREO TUNER</b>	 <b>AA-22 AMPLIFIER</b>	AS-21 or AS-10	
	<b>AR-13A AM, FM STEREO RECEIVER</b>		AS-21 or AS-10	AS-183 or AS-173 or AS-163 or AS-153
	 <b>AJ-41 AM, FM STEREO TUNER</b>	 <b>AA-100 AMPLIFIER</b>	AS-21 or AS-2A or AS-2 or AS-10	
<b>MEDIUM PRICED STEREO</b>				
ADP-114 ADP-124 ADP-104	 <b>AJ-12 FM, FM STEREO TUNER</b>   or <b>AJ-32 AM, FM, FM STEREO</b>	 <b>AA-151 AMPLIFIER</b>	AS-10 or AS-51 or AS-22	AS-163 or AS-153
<b>LOW COST STEREO</b>				
ADP-114 ADP-124	 <b>AJ-13 FM, FM STEREO TUNER</b>	 <b>AA-32 AMPLIFIER</b>	AS-51 or AS-81 or AS-41	AS-153 or AS-133
<b>MONO SYSTEMS</b>				
ADP-124 or ADP-114	 <b>AJ-53 AM TUNER</b>	 <b>AA-23 HIGH POWER AMP</b>	AS-10 or AS-51 or AS-22	AS-173 or AS-163 or AS-153
	 and/or <b>AJ-63 FM TUNER</b>	 <b>AA-13 MEDIUM POWER AMP</b>	AS-10 or AS-41 or AS-22	AS-153 or AS-133 or AS-123
ADP-124 Changer	 <b>BEGINNER'S AA-191 HI-FI MONO AMPLIFIER</b>		AS-81 or AS-41 or AS-193	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.

STEREO HI-FI

## Low Cost All-Transistor AM/FM/FM Stereo Tuner . . . Modern Styling and Sound, Old Fashioned Value!

**TAKE YOUR CHOICE!** The quiet, crystal-clear of FM. The dramatic realism of FM Stereo. Or the pop music, news and sports of AM. It's all there on the

AJ-33A with just a simple flip of the mode selector switch. It's all solid-state—a total of 23 transistors and 8 diodes—for cool, instant play that's free from microphonics. And since there are no tubes to deteriorate, the AJ-33A's life is a long, dependable one. And the sound is clean, natural and unchanging. It's all yours for only \$94.50 . . . including the rich walnut cabinet.

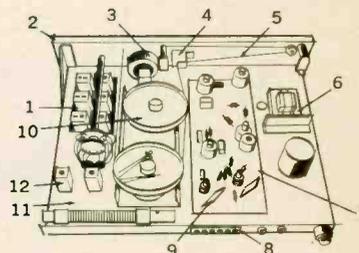
**MANY EXTRAS FOR CONVENIENCE, ADVANCED "SOLID-STATE" PERFORMANCE!** Like the built-in stereo demodulator that automatically separates the stereo signal into both channels; a stereo indicator that lights when stereo is received; an Automatic Gain Control to prevent overload distortion; an Automatic Frequency Control that snaps each FM station in, and keeps it there; and a Stereo Phase Control for maximum station separation with minimum distortion. Both channels are filtered for direct, beat-free stereo recording. And the tuning meter, illuminated 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 when dialing across the band.

**ACCIDENTAL SYSTEM SETTING CHANGES ARE MINIMIZED!** Thanks to the hinged lower front panel that protects the secondary controls . . . adds to 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!** Match this with the extruded brushed-gold anodized aluminum front panel, and you have a stereo component that enhances any stereo system setting. Mate it with 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 mc. Intermediate frequency: 10.7 mc. 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 cycles  $\pm$  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 cps. Channel separation: 30 db from 50 to 2 kc and 25 db at 10 kc. **AM SECTION:** Tuning range: 535 to 1620 kc. Intermediate frequency: 455 kc. Usable sensitivity: 8 uv @ 1000 kc. Antenna: Built-in rod with provision for external straight wire. Output voltage: 0.25 V. with 90% modulation. Image rejection: 40 db @ 600 kc. 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 cycles, 7 watts. Dimensions: 15 1/2" W x 3 3/4" H x 1 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.

## Economy With Excellence . . . Low-Cost

### Praise Winner! Matching All-Transistor 66-Watt Stereo Amplifier!

**WHAT HAVE AUDIO EXPERTS LIKE JULIAN D. HIRSCH LEARNED ABOUT THE HEATHKIT AA-22?** In a recent issue of HI-FI/STEREO REVIEW, Mr. Hirsch said: "The AA-22 is almost unique among amplifiers at or near its price, since it delivers more than its rated power over the entire range from 20 to 20,000 cps. . . . 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 . . . Intermodulation distortion was about 0.5% up to 10 watts, and only 1% at 38 watts per channel with both channels driven . . . The hum and noise of the amplifier were inaudible." What prompted such enthusiasm? A quick check of the AA-22's characteristics below will tell you.

**FIRST, PLENTY OF UNMODIFIED "TRANSISTOR POWER"!** A full 40 watts continuous (20 watts per channel), 66 watts IHF music power at each frequency throughout the entire 15 to 30,000 cps range at  $\pm$  1 db. Satisfies the requirements of practically all home stereo systems. And there are output taps for 4, 8 and 16 ohm speakers, plus filtered outputs for direct stereo recording.

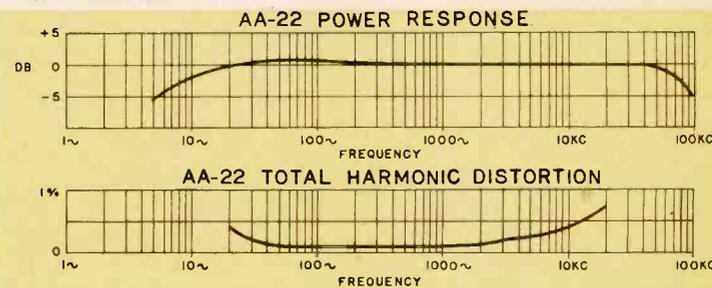
**SECOND, THE ABILITY TO HANDLE ANY PROGRAM SOURCE!** 5 pairs of stereo inputs accommodate stereo magnetic phono, stereo-mono tuners, stereo tape recorders and two other auxiliary inputs (stereo or mono).

**NEXT, VERSATILE CONTROLS FOR COMPLETE COMMAND!** Major front panel controls include a 5-position source selector switch, a 3-position "mode" selector 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.

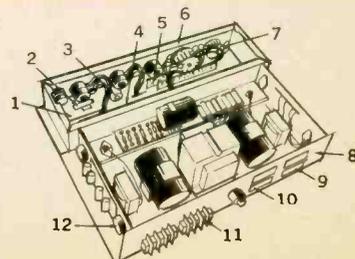
**AND DON'T FORGET THE RICH, MODERN STYLING!** Low-silhouette styling with a beautiful, factory-assembled walnut cabinet, extruded aluminum, brushed-gold front panel and matching brown knobs with spun-gold inlays. Matches the AJ-33A tuner. A handsome pair, that will "fit-in" just about anywhere. They look and 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 cps; write for prices.

**AA-22 SPECIFICATIONS—RECOMMENDED SYSTEM MATES:** Speakers: AS-21, page 39; AS-10, page 37; AS-22 and AS-51, page 38; AS-183 and 173, page 40; AS-163, 153 and 133, page 41; all changers and turntables, ppg. 34, 35 and 36. **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 kc. **Power response:**  $\pm$  1 db from 15 cps to 30 kc @ rated output.  $\pm$  3 db from 10 cps to 60 kc @ rated output. **Harmonic distortion:** (at rated output) Less than 1% @ 20 cps. 0.3% @ 1 kc, 1% @ 20 kc. **Intermodulation distortion:** (at rated output) Less than 1%. 60 and 6,000 cps 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 cps 60 db @ 1 kc, 40 db @ 20 kc. **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 switch. **Semiconductor complement:** 20 transistors, 10 diodes. **Power requirements:** 105-125 volts, 50-60 cycles 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 1/2" W x 3 3/4" H x 1 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.



- 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"

MR. JAMES E. SKIBO, BETHLEHEM, PA., AJ-33A OWNER: "... with no external antenna on either AM or FM, I find that I can receive AM for a five-hundred mile radius and FM for a hundred mile radius! Stereo too! Now that is what I call a tuner!"

AJ-33A OWNER MR. D. W. WELSH, CLINTON, N. C.: "My AJ-33A Heathkit AM-FM-FM Stereo tuner is performing beyond my fondest dreams with excellent channel separation."



AJ-33A  
\$94<sup>50</sup>

## Heathkit® All-Transistor Stereo!



- 20 transistor, 10 diode circuit
- Delivers full 66 watts IHF music power, 40 watts continuous at  $\pm 1$  db from 15 to 30,000 cps
- 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  
\$99<sup>95</sup>

STEREO HI-FI

# New! Lowest Cost All-Transistor Stereo!



AJ-14  
\$49.95  
(less cabinet)

## FM Stereo Tuner Performs Like A Million . . . Costs Just \$49.95 . . . Assembles In 6 Hours

- 14-transistor, 4-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

**AMERICA'S BEST TRANSISTOR STEREO TUNER BUY!** That's the new Heathkit AJ-14 FM stereo tuner. The full, natural beauty of transistor sound in a cool, compact unit for only \$49.95. Proof that quality need *not* be expensive. Compare the AJ-14's features!

**START WITH THE 14-TRANSISTOR, 4-DIODE CIRCUITRY.** Delivers a solid, natural sound . . . runs cool—no tubes . . . non-microphonic . . . all the transistor traits that are causing the rapid surge to solid-state stereo. There are filtered outputs to insure clean recording of all your favorites. Combine this with the prebuilt & aligned 3-transistor front-end containing an RF amplifier & separate local oscillator, add a 4-stage IF section and you have FM sensitivity & selectivity comparable to much more expensive tuners.

**BUILD IT IN 6 HOURS OR LESS!** World's easiest stereo/hi-fi kit to assemble. All parts mount on one simple circuit board . . . leaves a minimum of point-to-point wiring.

**4 FRONT-PANEL CONTROLS FOR SIMPLE OPERATION!** An Off-On switch.

**HUM & NOISE:** The amount of extraneous hum and noise voltage in comparison to the signal output voltage. Usually expressed as "X DB Below" a power output in watts. The higher the value of X, the better the amplifier.

**TOTAL HARMONIC DISTORTION:** The percentage of all harmonics contained in a given signal. The lower this figure, the better the sound reproduction.

**POWER RESPONSE:** Frequency range over which an amplifier will deliver its full rated RMS power. No frequency should measure more than 3 decibels (db) below the reference frequency (usually 1 kc).

**FREQUENCY RESPONSE:** A measurement of variation in voltage gain as a function of frequency. It's desirable for voltage gain to remain constant regardless of frequency.

**INPUT SENSITIVITY:** The input voltage level required to develop a specified voltage or power output.

**AUTOMATIC FREQUENCY CONTROL (AFC):** The circuitry of a tuner which automatically keeps the tuner adjusted to the proper frequency, thus preventing off-station drift.

**AUTOMATIC GAIN CONTROL (AGC):** Circuitry designed to keep output constant regardless of incoming signal strength. Prevents "blasting" and "fading" of sound output.

**INTERMEDIATE FREQUENCY (I.F.):** Frequency to which an incoming signal is changed by superheterodyne reception.

**RUMBLE:** Extremely low frequency component of program material usually resulting from mechanical vibration of phonographic equipment.

26

Tuning knob. A Mono-Stereo switch. And a stereo phase control to insure maximum separation from any stereo station. You'll like the convenience of the automatic stereo indicator, too. Lights whenever stereo is broadcast. Specially designed filters remove SCA interference.

**DELUXE FEATURES!** Like the edge-lighted slide-rule dial . . . flywheel tuning . . . the transformer-operated power supply with silicon rectifier . . . and attractive extruded aluminum front panel. Custom mount it in a wall or cabinet. Or choose either the Heath modern walnut veneer or metal cabinet for only a few dollars more.

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

Model AE-35, 3 lbs. . . beige metal cabinet (12 $\frac{1}{2}$ " W x 9 $\frac{1}{4}$ " D x 3 $\frac{1}{8}$ " H.) \$3.50

Model AE-25, 2 lbs. . . genuine walnut veneer cabinet (12 $\frac{1}{2}$ " W x 9 $\frac{1}{4}$ " D x 3 $\frac{3}{8}$ " H.) . . . . . \$7.95

**AJ-14 SPECIFICATIONS—**Tuning range: 88-108 mc. Antenna: Balanced input for external 300 ohm antenna. Intermediate frequency: 10.7 mc. IHFM sensitivity: 5 uv for less than 3% total noise, distortion, hum. Hum & Noise: 55 db below full output for 1000 uv input, 400 cps, 100% mod. Audio frequency response: Mono,  $\pm 1$  db from 20-20,000 cps. Stereo,  $\pm 3$  db from 50-15,000 cps. Output impedance: 12 K ohm. Output voltage: 0.5 v. for 1000 uv input, 400 cps, 100% mod. Outputs: Left & Right channels. Harmonic distortion: Less than 1% for 1000 uv input, 400 cps, 100% mod., 98 mc. Image ratio: 40 db for 30 db of usable sensitivity, 400 cps, 100% mod., 98 mc. Capture ratio: 3 db for 1000 uv input, 400 cps, 100% mod., 98 mc. AFC correction: 150 kc per volt. AM suppression: 40 db. IF rejection: 75 db. 19 KC & 38 KC suppression: 40 db below rated output. SCA rejection: 40 db min. Transistor complement: (1) TI XM201 RF amp.; (1) TI XM203 osc.; (1) 2 SA 240 mixer; (4) 2N2654 IF amp. & limiter; (7) 2N2712 multiplex amp.; 19 kc amp. emitter follower, 38 kc osc., switching detectors, stereo indicator amps. Front panel controls: Off-on switch, mono-stereo switch, stereo phase control & tuning. Dimensions: 12" W x 3 $\frac{1}{4}$ " H x 9 $\frac{1}{4}$ " D overall.

## GLOSSARY OF AUDIO TERMS

**WOW:** An audible change in pitch of a sustained note caused by slow variations in speed of a record turntable or tape transport.

**FLUTTER:** Similar to WOW except that it occurs at a faster rate.

**INTERMODULATION DISTORTION:** Distortion created by passing two signals of different frequency and amplitude thru a non-linear device. This type of distortion appears as the sum and difference of the two frequencies involved, and is considered more displeasing to the ear than harmonic distortion.

**WOOFER:** Any speaker especially designed for reproducing the low audio frequencies.

**TWEETER:** Any speaker especially designed for reproducing the high audio frequencies.

**SEPARATION:** The ability of one stereo channel to reject interference from the opposite channel.

**DAMPING FACTOR:** A figure expressing the ratio of rated load impedance to internal impedance of a power amplifier as it appears at the output terminal.

**IMPEDANCE:** The total opposition to the flow of alternating current in a circuit. Since it opposes the flow of current it has the same unit of measure (ohms) as resistance.

**POWER OUTPUT:** The electrical power, expressed in watts, that is supplied by an amplifier to a given load.

**CROSS-OVER FREQUENCY:** The single frequency at which the outputs of both the low frequency and high frequency filters are identical in amplitude.

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

# Deluxe "Tube-Type" Stereo/Hi-Fi!

AA-100  
\$84<sup>95</sup>

AJ-41  
\$112<sup>50</sup>



## 60 Watts Of Stereo Power For Only \$84.95 . . . Deluxe Tube-Type 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

PLENTY OF POWER FOR ANY STEREO TASK! 50 "Heath-Rated" watts continuous, 60 watts IHF music power at  $\pm 1$  db from 30 to 15,000 cps.

PLENTY OF VERSATILITY FOR COMPLETE STEREO PERFORMANCE! Features five stereo inputs—stereo magnetic phono input, a pair of tuner inputs for both FM and AM, a pair of tape recorder inputs, plus two pairs of auxiliary source inputs! In addition the tape playback heads can be connected directly without external preamplification or equalization.

PLENTY OF VERSATILE SPEAKER PERFORMANCE! Three different speaker impedances—4, 8, and 16 ohms; plus a "mixed-channel" speaker output for stereo center "fill-in" or for monophonic sound to other rooms. And the cathode follower outputs to minimize hum and high frequency losses.

PLENTY OF VERSATILE "FINGERTIP" CONTROLS! Includes preamplifier input level controls . . . power amplifier input level controls . . . hum controls . . . mode selector, speaker phase reversal switch, balance and separation controls . . . ganged volume controls . . . and separate concentric bass and treble tone controls.

SMART, DESIGNER STYLING! Attractive luggage tan vinyl-clad steel cabinet with polished aluminum trim and soft refracted lighting bar matches the AJ-41 Tuner (opposite) . . . matches any decor!

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

**AA-100 SPECIFICATIONS**—Channels: 2. Power output: 50 watts (25 w. per channel) Heath Hi-Fi Rating: 60 watts (30 w. per channel) IHFM Music Power Output (0.7% THD, 1 kc). Power response:  $\pm 1$  db from 30 cps to 15 kc at 25 watts output per channel. Harmonic distortion: Less than 0.5% at 25 watts, 1 kc. Less than 2% at 25 watts, 30-15,000 cps (each channel). Intermodulation distortion: Less than 1% at 25 watts, 60 and 6,000 cps 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 kc. 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. Input impedance: Mag phono, 47 K ohms (may be changed); tape head, 470 K ohms; tuner & aux., 250 K ohms each. Outputs: 4, 8 and 16 ohms; cathode follower tone recorder outputs. Damping factor: 15. Controls: Function switch (4-position); selector switch (6-position); balance control (total range, 16 db); separation control; ganged level controls; dual-concentric base & treble controls, phase and power switch. Power requirements: 105-125 volts, 50-60 cycles, 150 watts. Power outlets: 2 AC receptacles, 1 switched, 1 unswitched. Dimensions: 5" H x 15 1/4" W x 13 1/2" D. (allow 1" for cables at rear).

## All-Around Value, All-Around Performer . . . Deluxe Tube-Type AM/FM/FM Stereo Tuner!

- 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

COMPLETE LISTENING AT YOUR COMMAND! Maximum fidelity AM . . . the quiet beauty of FM . . . the concert hall realism of FM Stereo.

ENJOY "FRONT-ROW CENTER" PERFORMANCE WITH DELUXE FEATURES! Features like the automatic stereo indicator that gently signals when stereo is broadcast . . . the built-in stereo adapter . . . adjustable automatic frequency control that locks-in stations for drift-free reception . . . adjustable stereo phase control that maximizes stereo separation and minimizes distortion . . . individual AM and FM tuning meters for precision station tuning . . . FM squelch control to eliminate between-station noise . . . cathode follower outputs that minimize hum and high frequency cable losses . . . and the output stages that "tie" together so the same information is fed to both channels when AM or FM mono is played.

FOR ADDED CONVENIENCE, there's smooth, effortless flywheel tuning; a glare-free lighted slide-rule dial; a fidelity switch for normal or maximum AM fidelity; built-in antennas; and external antenna terminals.

STURDY STEEL CABINET HANDSOMELY CLAD IN LUXURIOUS LUGGAGE-TAN vinyl with polished trim lends a touch of modern elegance to any decor! Matches the AA-100 60-watt Amplifier opposite!

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

**AJ-41 SPECIFICATIONS**—FM: Tuning range: 88 mc to 108 mc. I.F. frequency: 10.7 mc. Frequency response:  $\pm 2$  db, 20 to 20,000 cps. Antenna: 300 ohm balanced (for internal or local reception). Output voltage: Nominal .5 volts (with 3 uv 30% modulation in). Quiet-ing 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 kc (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:  $\pm 2$  db, 50 to 15,000 cps. Sub-carrier bandpass:  $\pm 3$  db 23,000 to 53,000 cps. 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 kc, 3 uv; 1000 kc, 4 uv; 600 kc, 8 uv (standard IRE dummy antenna, .1 volt RMS reference output). Sensitivity change, narrow to broad position: —5 db. I.F. bandwidth, narrow: 14 kc, 6 db down. Broad: 20 kc, 6 db down. Image ratio: 1400 kc 50 db; 600 kc 75 db. Harmonic distortion: Less than 1%. Hum & noise: 35 db below 30% modulation (1000 kc unmodulated with 100 uv in). I.F. rejection ratio: 1400 kc 42 db; 600 kc 38 db. Power supply: Transformer operated, 117 v., 50-60 cycle, 100 watts. Dimensions: 5 1/4" H x 15 1/4" W x 14 1/4" D.

STEREO HI-FI

AJ-12  
\$65<sup>95</sup>



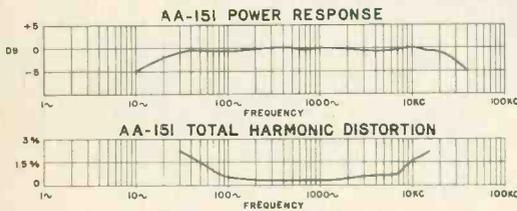
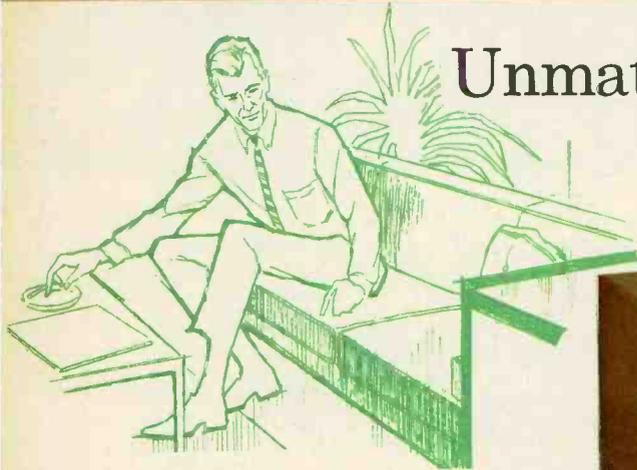
**Circuit Board Assembly**  
Assures fast, easy assembly and high stability . . . minimizes errors! Includes built-in FM multiplex converter!



**Stereo Indicator Light**  
Automatically signals when a stereo program is broadcast.



## Unmatched Performance & Savings..



AA-151  
\$59<sup>95</sup>



AJ-32 \$84<sup>95</sup>

- 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 (above)

### For Complete Listening Satisfaction At Lower Cost, Choose This Versatile AM/FM/FM Stereo Tuner!

**ALL-MODE LISTENING AT THE FLICK OF A SWITCH!** Keep up to the minute with the latest news, sports & music of AM; or relax with the quiet beauty of FM or FM stereo. It's all at your fingertips with the versatile AJ-32.

**SAME FINE FEATURES AS THE AJ-12 ABOVE!** In addition the AJ-32 has an AM section with AM fidelity switch that selects desired bandwidth for maximum selectivity or highest fidelity. Also features built-in AM & FM antennas, plus external antenna terminals. Circuit board construction and prealigned, preassembled tuning unit assures quick, easy assembly. Kit AJ-32, 23 lbs. . . No money down, \$9 mo. . . . . \$84.95

**AJ-32 SPECIFICATIONS—AM Section:** Tuning range: 550 kc—1600 kc. Usable sensitivity (normal position): 1400 kc—10 microvolts (20 db of quieting); 1000 kc—15 microvolts (20 db of quieting); 600 kc—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 mc—108 mc. 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 mc): Less than 1%. IF rejection (98 mc): —65 db. FM audio response (20-20,000 cps): ±1 db. AM suppression: —27 db. Hum and noise (25 microvolts, 30% mod.): —48 db. Quieting sensitivity: 20 db—2½ microvolts; 30 db—3½ microvolts; 48 db—30 microvolts (max. quieting). **FM Stereo Converter Section:** Audio frequency response: ±2 db from 50 to 15,000 cps. Subcarrier bandpass: ±3 db from 23,000 to 53,000 cps. Channel separation: 30 db or more at 1 kc; 25 db or more at 10 kc. Hum and noise: —55 db relative to 1 volt rms output. Output impedance (cathode follower): Variable to 4000 ohm, each channel. Size: 5¼" H x 15¼" W x 11" D.

## Attractive In Styling, Attractive In Price . . . 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 below

"I Believe That Its Quality Could Never Be Exceeded In Its Own Price Range." That comment came to us in a letter from AJ-12 owner Mr. James Totten, Lincoln Park, Mich. Mr. Totten went on to say: ". . . I'm listening to it right now through the model AA-151 (amplifier, see below) and its sound is unsurpassed." The reason for this performance? Famous Heath "Engi-nuity" that incorporates features found only on units selling for far more.

**COMPARE THESE FEATURES!** Features like the FM multiplex circuit that's built-in as an integral part of the tuner . . . the Stereo Indicator that lights when you've tuned a stereo broadcast . . . the Stereo Phase Control that maximizes stereo separation, thus assuring minimum distortion . . . the Automatic Frequency Control that locks-in stations for clear, drift-free reception. And you can record your favorite stereo programs without any extraneous noise, thanks to the filtered stereo outputs.

For pin-point station selection, there's a bar-type "eye" tuning indicator, large, edge-lighted slide-rule dial and flywheel!

**FAST, SIMPLE ASSEMBLY . . . DESIGNER STYLING!** A pre-aligned, 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 beautifully clad in luggage-tan vinyl with a charcoal gray front panel and polished anodized aluminum trim. Enriches any decor. Matches the AA-151 stereo amplifier (below).

Kit AJ-12, 19 lbs. . . no money dn., \$7 mo. . . . . **\$65.95**  
Export model available for 115-230 VAC, 50-60 cps; write for prices.

**AJ-12 SPECIFICATIONS—FM SECTION:** Tuning Range: 88 mc-108 mc. Intermediate Frequency: 10.7 mc. Antenna: Balanced input for external 300 ohm antenna. Internal line antenna. Image Ratio (30 microvolts—30% mod.—98 mc): —45 db. Harmonic Distortion (25 microvolts—100% mod.—98 mc): Less than 1%. IF Rejection (98 mc): —65 db. FM Audio Response (20-20,000 cps): ±1 db. AFC Correction Factor (Full AFC): 100 kc 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 cps. Sub-Carrier Bandpass: ±3 db from 23,000 to 53,000 cps. Channel Separation: 30 db or more at 1 kc; 25 db or more at 10 kc. Size: 5¼" H x 15¼" W x 10½" D.

## Heathkit® "Tube-Type" Stereo/Hi-Fi!

### Respected For Its Performance & Value . . . Heathkit 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-12 & AJ-32 tuners (this page) in styling & performance • Easy to build . . . easy to buy

"My Wife & I Recently Finished Our AA-151 Amplifier . . . we were most pleased with its construction. It's another example of your fine engineering. Many of our friends comment about its fine sound and great looks." These comments from Mr. Robert R. Tyrrell, Cloverdale, Calif. A typical reaction to the AA-151. Typical reasons why you should join the thousands who have made this amplifier and audiophile favorite!

**HANDLES ANY PROGRAM MATERIAL FOR COMPLETELY ENJOYABLE LISTENING!** AM, FM, FM stereo radio . . . stereo or mono records . . . stereo & mcno tapes . . . or auxiliary sources such as a TV set. Just connect your favorite source, relax & listen. Provides 28 watts continuous, 32 watts IHF music power at ± 1 db from 30 to 20,000 cps. **FINGERTIP CONTROLS PUT YOU IN COMMAND!** A 6-position mode switch allows independent or combined choice of either stereo channels. A

dual-concentric volume control and separate ganged bass & treble controls provide simultaneous or individual channel adjustments. Also has a speaker phase-reversal switch, and two AC outlets (switched & unswitched) on the back.

**HANDSOME EYE-APPEALING STYLING!** Clean and uncluttered . . . just like its performance. Tan vinyl-clad steel cabinet with charcoal gray front panel & anodized aluminum trim. Matches the AJ-12 & AJ-32 tuners, this page.

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

**AA-151 SPECIFICATIONS—Recommended System Mates:** Separate Speakers, AS-163, pg. 23; Speaker Systems, AS-51, AS-10, pg. 26; all changers & turntables, ppg. 24 & 25; Tuner, AJ-12 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 kc). Power response: ±1 db from 20 cps to 20 kc at 14 watts output per channel. Harmonic distortion: Less than 2%, 30 cps to 15 kc at 14 watts output per channel. Intermodulation distortion: Less than 2% at 14 watts output per channel using 60 cps and 6 kc 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 kc; crystal phono, 0.2 volts; tuner and aux., 0.2 volts. Outputs: 4, 8 and 16 ohms. Dimensions: 15¼" W x 5¼" H x 11" D.

### Value-Priced AM/FM Monophonic Tuner . . . Modern Styling & Sound!



AJ-11  
**\$65.95**

- Converts to stereo with AC-11 adapter, pg. 32 • Adjustable AFC for drift-free reception • Individual AM & FM tuning "eyes" • AM fidelity switch for highest fidelity, or extra selectivity • External antenna terminals • Flywheel tuning • Matches the AA-151 amplifier (above)

Kit AJ-11, 21 lbs. . . no money dn., \$7 mo. . . . . **\$65.95**  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**AJ-11 SPECIFICATIONS—FM SECTION:** Tuning range: 88 to 108 mc. Quieting sensitivity: 2.5 uv for 20 db of quieting; 3.5 uv for 30 db of quieting; 30 uv for max. quieting, 48 db. Image ratio: —45 db, 30 uv, 30% mod., 98 mc. IF Frequency: 10.7 mc. IF Rejection: —55 db @ 98 mc. Output impedance (cathode follower): Variable to 800 ohms. Output voltage: 1 volt, 30 uv, 30% mod. Frequency response: ±1 db, 20-20,000 cps. Harmonic distortion: Less than 1%, 25 uv, 100% mod., 98 mc. Hum & noise: —43 db, 25 uv, 30% mod. RF Stage: 1 tuned RF amplifier. AFC Correction factor (Full AFC): 100 kc per volt. AM Suppression: —27 db. Multiplex output: Output supplied for external multiplex adapter. **AM SECTION:** Tuning range: 550-1600 kc. Sensitivity: Narrow position: 1400 kc, 10 uv; 1,000 kc, 15 uv; 600 kc, 40 uv. Frequency response: ±2.5 db; 20-9,000 cps (40 db down at 10 kc). Image rejection: 1400 kc, 40 db; 1000 kc, 50 db; 600 kc, 60 db. IF Frequency: 455 kc. IF Rejection: 1400 kc, 30 db; 600 kc, 50 db. Output impedance (cathode follower): Variable to 800 ohms. Output voltage: 1 volt, 750 uv, 30% mod. Harmonic distortion: Less than 1%, 750 uv, 95% mod. Hum & noise: 30 db down (5000 uv, 30% mod). RF Stage: 1 tuned RF amplifier. AVC: Derived from voltage doubler detector. **GENERAL:** Tuning indicators: 2 magic eye tubes, one AM, one FM. Controls: AM bandwidth, broad/narrow; Function selector, AM/Stereo/FM; FM AFC, full/half/off; AC power on-off; AM tuning; FM tuning; AM level; FM level. Tube complement: (AM) 2-6BA6, 1-6BE6, 1-6BN8, 1-6ME5. (FM) 1-6C9, 3-6AU6, 1-6BN8, 1-6ME5. Transformer operated, full wave voltage doubler with 2 silicon rectifiers. Power requirements: 117 V, 50-60 cycles, 40 watts. Dimensions: 15¼" W x 5¼" H x 11" D.

STEREO HI-FI

# Budget-Saver Stereo/Hi-Fi



AJ-13  
\$47<sup>00</sup>



AA-32  
\$39<sup>95</sup>

## Decorator Styled FM/FM Stereo Tuner . . . Maximum Performance Features . . . Simple To Assemble & Operate!

- 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

**CONSIDERING A GOOD LOW-COST STEREO SYSTEM?** One that won't hurt your budget? Then consider the AJ-13 tuner and matching AA-32 amplifier (opposite). Together they give you complete stereo electronics, as well as performance and operating conveniences found only on more expensive units. All for less than \$90! Just add 2 speakers and enjoy!

**WITH THE AJ-13, YOU ENJOY MAXIMUM PERFORMANCE** with minimum adjustments. Just 3 controls to operate . . . On/Off-FM-Stereo Selector; a tuning control; and AFC On-Off Switch. What could be simpler? And yet, you enjoy features like the Automatic Frequency Control that locks in stations for clean, drift-free reception. A Stereo Indicator that lights when stereo is broadcast. An edge-lighted Slide-Rule Dial for quick, easy station selection. A Flywheel Dial for smooth, accurate tuning. Point-to-point wiring plus a factory assembled and aligned "front-end" for fast, simple construction . . . takes only a few evenings.

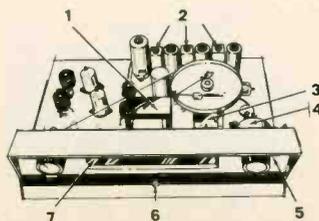
**YOU'LL LIKE THE MODERN COLOR STYLING, TOO!** Rich mocha brown, all-steel cabinet with a neutral beige front panel and black trim. Blends with any decor . . . traditional or modern. Or custom install it in a wall, if you wish, by following the recommendations in the manual.

**SETTLE BACK, RELAX & LISTEN!** The sound's superb . . . the styling stunning . . . the savings great!

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

**AJ-13 SPECIFICATIONS**—Tuning range: 88 to 108 mc. Intermediate frequency: 10.7 mc. 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 cps. Stereo—±2 db from 50 to 15,000 cps. Antenna: Balanced input for external 300 ohm antenna. Channel separation: 25 db or more at 1000 cps. Front panel controls: Tuning selector switch, power off-FM-stereo; AFC switch, off-on. Dimensions: Overall: 13½" W x 4¼" H x 9½" D.

1. Transformer operated power supply 2. Prealigned IF and ratio detector transformers 3. Preassembled-prealigned tuning unit 4. Flywheel tuning 5. AFC Switch 6. Stereo Indicator 7. Edge-lighted slide-rule dial



## Matching 20-Watt Stereo Amplifier . . . Full Controls . . . Operates With Magnetic & 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 just a few evenings

**PROOF THAT QUALITY NEED NOT BE EXPENSIVE!** With the Heathkit AA-32 Stereo/Hi-Fi Amplifier you can install a full-performance unit in the living room, den, rec room, etc., for only \$39.95! And both the AA-32 & matching AJ-13 FM Stereo Tuner (opposite) are compact . . . ideal for limited-space installations or shelf-mounting. You can even panel mount them in a wall by following the recommendations in the manual.

**PLENTY OF CLEAN, UNDISTORTED POWER!** A full 16 watts continuous, 20 watts IHF music power at ±1 db from 30 to 30,000 cps. Plenty of versatility! Four switch-selected stereo inputs on each channel handle magnetic & ceramic phono cartridges, tuner, and auxiliary sources.

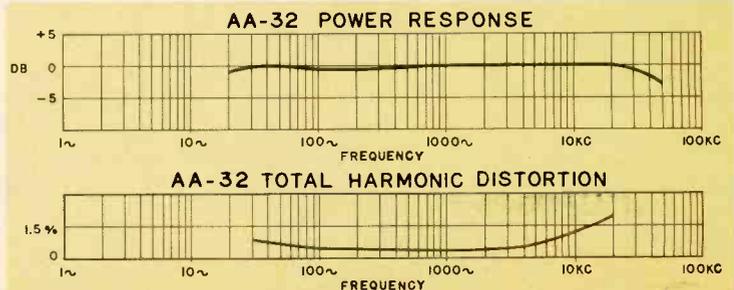
**COMPLETE CONTROLS PUT YOU IN FULL COMMAND!** The dual-concentric volume control allows adjustment of both channels individually or simultaneously. A mode selector lets you dial the desired program source. And a pair of full-range tone controls are ganged to permit simultaneous bass and treble adjustment on both channels. A separate power switch turns the AA-32 on & off without disturbing the volume or tone control settings.

**A 7-TUBE AMPLIFYING CIRCUIT** boasts two push-pull power output stages, plus 2 four-stage preamps. And the transformer-operated power supply features a full-wave doubler silicon diode circuit.

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

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

**AA-32 SPECIFICATIONS**—Recommended System Mates: Speakers: AS-193, AS-81, pg. 38; AS-163, AS-133, AS-123, pg. 41. Speaker Systems: AS-22, AS-51, AS-81, pg. 38. All changers & turntables, ppg. 34 & 35. 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 cps to 30,000 cps at rated output. Harmonic distortion: (at rated output) 2% @ 30 cps, 0.7% @ 1000 cps, 2% @ 15,000 cps. Intermodulation Distortion: (at rated output) Less than 3% using 60 and 6000 cps mixed 4:1. Dimensions: 13½" W x 4¼" H x 9¼" D.



# Stereo Separates!



AA-141A  
**\$34<sup>95</sup>**



AA-121  
**79<sup>95</sup>**

## Heathkit Low-Cost Preamplifier . . . An Ideal Control Center For Any Stereo System!

- 4 inputs for each channel • 6-position function selector for stereo or mono • Cathode follower outputs for low line loss, less distortion • Built-in power supply permits use with any basic power amplifier • Baxandall-type tone controls for true, natural sound • Frequency response  $\pm 1$  db from 20 to 20,000 cps • Low impedance outputs for stereo tape recording

VERSATILITY COUPLED WITH ITS LOW PRICE make the AA-141A an unbeatable value! Compare. Features a built-in power supply to work with any basic stereo power amp like the AA-121 opposite . . . low impedance cathode follower outputs to assure installation flexibility in any system . . . 4 inputs per channel—mag. phono, crystal phono & 2 auxiliaries—handles virtually any stereo or mono source . . . a 4-position input selector for simple switch selection of any input . . . 6-position function selector to hear either channel through its own speaker, either channel through both speakers, normal stereo or stereo reverse . . . concentric volume controls for individual or simultaneous adjustment of each channel and Baxandall-tone controls for complete command of bass & treble.

**EASY TO BUILD . . . LUXURIOUS STYLING!** Goes together quickly, easily . . . no special skills or knowledge needed. The sturdy, all-steel cabinet clad with luggage-tan vinyl is gracefully accented by the charcoal gray front panel and polished trim . . . matches the AJ-12 & AJ-32 tuners, pg. 28. Kit AA-141A, 11 lbs. . . no money dn., \$5 mo. . . . . **\$34.95** Export model available for 115/230 VAC, 50-60 cps, write for prices.

**AA-141A SPECIFICATIONS—Channels: 2. Inputs (each channel):** Mag Phono, Xtal Phono, Aux 1, Aux 2. **Outputs (each channel):** Power amplifier, tape recorder. **Frequency response:** (with the volume control at maximum and the Bass and Treble controls set approximately to the mid position):  $\pm 1$  db from 20 to 20,000 cps. **Harmonic distortion:** (at 2.5 volts rms output, using AUX 1 or 2 Input): .1% or less. **Intermediate distortion:** (at 2.5 volts equivalent rms output using AUX 1 or 2 inputs): .1% or less. **Channel separation:** 45 db or better 20 to 20,000 cps. **Hum and noise (below 2.5 volts RMS):** Mag Phono, 55 db (or better); Xtal Phono, 65 db (or better); Aux 1 and 2, 65 db (or better). **Tube complement:** 6-61EU7 tubes. **Controls and switches:** Source Selector Switch, Bass controls, Treble controls, Volume controls, Mode selector switch (left amp, right amp, mono left source, mono right source, stereo norm, stereo rev.). Power (off-on), Filament balance (left channel and right channel). **AC receptacles:** 1-switched, 117 V AC, 375 watts maximum. 1-unswitched, 117 V AC, 375 watts maximum. **Power supply:** Transformer-operated, using two selenium rectifiers in a voltage doubler arrangement. **Power requirements:** 117 volts, 50-60 cps AC, 19.7 watts. **Dimensions:** 15 $\frac{1}{4}$ " W x 5 $\frac{1}{4}$ " H x 7 $\frac{3}{4}$ " D (overall).

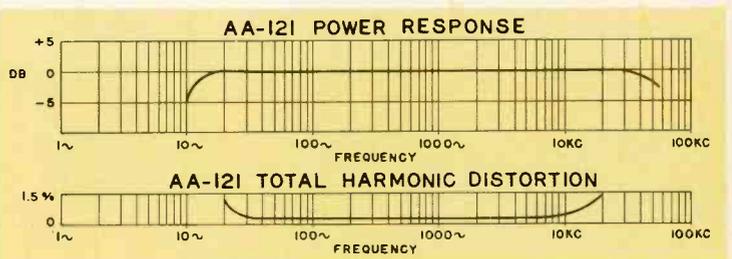
## 98-Watt Ultra-Linear® Stereo Power Amplifier . . . Less Than A Dollar A Watt!

- Furnishes 98 watts IHF music power, or 80 watts RMS power at  $\pm 1/2$  db from 20 to 20,000 cps • Heath patented Ultra-Linear® output circuit • "Bias-Bal" output balancing circuit • Mixed-channel center speaker output • Individual amplifier gain controls • Ideal for use with AA-141A preamplifier

VERSATILE FEATURES FOR CONVENIENCE, OPTIMUM PERFORMANCE! Like the patented Ultra-Linear® output circuit for superb fidelity . . . "Bias-Bal" output balancing circuit for low distortion . . . mixed-channel output for stereo fill-in or mono play to other rooms . . . individual input level controls . . . speaker phase reversal switch . . . on/off switch . . . and line voltage-surge protection to insure long-life. Each channel delivers up to 49 watts to drive the most elaborate speaker systems. Or you can channel all 98 watts to a mono speaker with the handy "stereo-mono" switch & terminal connection changes.

Kit AA-121, 39 lbs. . . no money dn., \$8 mo. . . . . **\$79.95** Export model available for 115/230 VAC, 50-60 cps; write for prices.

**AA-121 SPECIFICATIONS—RECOMMENDED SYSTEM MATES:** Speakers: AS-2A, AS-10, AS-2, pg. 37; AS-21, pg. 39. **Channels: 2. Power output:** 80 watts (40 w. per channel) Heath Hi-Fi Rating; 98 watts (49 w. per channel) IHFM Music Power Output [0.7% THD, 1 kc]. **Power response:**  $\pm 0.5$  db, 20-20,000 cps, at 40 watts output per channel. **Harmonic distortion:** 1.5% or less, 20-20,000 cps, at 40 watts output per channel. **Intermodulation distortion:** 0.5% or less at 40 watts output per channel, 60 and 6,000 cps mixed 4:1. **Hum and noise:** 85 db below 40 watts output. **Channel separation:** 70 db or better at 1 kc. **Input sensitivity:** 0.95 volts rms for 40 watts output per channel. **Outputs:** 4, 8, 16, and 32 ohms per channel; center speaker terminals can be used with 4, 8 or 16 ohm speakers. **Damping factor:** 16:1, 8 and 16 ohm taps; 12.5:1, 4 ohm tap. **Controls:** A Channel; bias balance, bias voltage, level. B Channel; bias balance, bias voltage, level. **Function selector;** phase and power switches. **Tube complement:** 2-6AN8; 4-EL34, 4 silicon diode rectifiers, 1 selenium bias rectifier. **Power requirements:** 117 v, 50-60 cycles, 180-320 watts. **Power outlets:** 2 AC outlets; 1 switched, 1 unswitched. **Color and finish:** metallic bronze, expanded metal dust cover; black chassis with ivory lower front panel. **Dimensions:** 7 $\frac{1}{2}$ " H x 15" W x 11" 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.

STEREO HI-FI

# For The Budget-Minded Music Lover...



## Heathkit FM Tuner . . . Modern Styling . . . Converts To Stereo With AC-11 Multiplex Converter

- Broad band 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. 33 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**, 11 lbs., no money dn., \$5 mo. **\$37.50**  
Export model available for 115/230 V. AC, 50-60 cps; write for prices.

**AJ-63 SPECIFICATIONS**—Tuning range: 88 to 108 mc. 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 mc. Image ratio: 40 db. AFC correction factor: 75 kc per volt. AM suppression: 25 db. Frequency response:  $\pm 2$  db, 20-20,000 cps. Harmonic distortion: Less than 1.5%, 1100 uv, 400 cycles 100% modulation. Intermodulation distortion: Less than 1%, 60 cycles and 6 kc, 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 cycles AC at 30 watts. Overall dimensions: 4 1/16" H x 13 3/4" W x 7" D.

AJ-63  
**\$37.50**



AJ-53  
**\$26.50**

AC-11A  
**\$23.50**

## Add The Realism Of Stereo 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 or AJ-11 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:  $\pm 2$  db 50 to 15,000 cps. Subcarrier bandpass:  $\pm 4$  db 23,000 to 53,000 cps. 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 cps, 12 watts. Size: 3 3/8" H x 3 3/8" W x 9 7/8" D.

## Decorator-Styled Heathkit AM Tuner . . . A New Dimension In AM Hi-Fi Listening!

- Sensitive superhet circuit with tuned RF stage
- Fidelity switch to choose normal or maximum bandwidth
- Built-in transformer operated power supply with silicon rectifier for safety and long life
- 10 kc whistle filter
- Voltage doubler detector for lowest distortion
- Mocha brown, beige & black styling matches AA-13 & AA-23 amplifiers, pg. 33

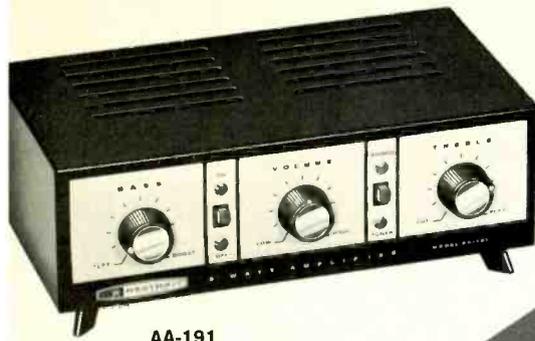
**FEATURES A SPECIAL FIDELITY SWITCH** for unusually high selectivity with normal bandwidth or optimum high fidelity with maximum bandwidth. A full-wave voltage doubler detector assures lowest distortion. Two outputs are provided—one is a "variable" cathode follower for direct driving of power amplifiers, 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**, 10 lbs., no money dn., \$5 mo. **\$26.50**  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**AJ-53 SPECIFICATIONS**—Tuning range: 550 kc to 1600 kc. Intermediate frequency: 455 kc. Sensitivity (for 20 db quieting IHFM standards): 1000 kc—25 uv. IF bandwidth (6 db down): NORMAL—7 kc.; MAXIMUM—16 kc. Output impedance (cathode follower): 5000 ohms. Input signal for 1 volt output: 7 uv—30% mod. 1000 kc. Image ratio: 1000 kc—57 db. Harmonic distortion (750 uv 95% mod.): Less than 2%. Hum and noise (5000 uv—30% mod.): 36 db. IF rejection: 1000 kc—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 cycles at 19 watts. Dimensions: Overall including cabinet and feet, 4 1/16" H x 13 1/4" W x 5 1/2" D.

# Low-Cost Heathkit® Hi-Fi!



AA-191  
**\$15<sup>95</sup>**



AA-23  
**\$42<sup>95</sup>**



AA-13  
**\$29<sup>95</sup>**

## Ideal For "Starter" Or "Second" Music System . . . Heathkit 3-Watt Mono Amplifier!

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

**SMALL SIZE, BIG PERFORMANCE!** That's the compact AA-191 that fits anywhere, yet delivers 3 watts of power. Perfect for the hi-fi beginner, or the heart of a low-cost second system. Costs just \$15.95.

**VERSATILE, TOO!** Boasts a built-in preamplifier that features switch-selection of two inputs . . . crystal or ceramic phono, tuner, etc. Has volume, bass and treble tone controls plus output taps 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 needs.

**QUICK & EASY TO BUILD!** Finish in an evening. Ideal for bookshelf, end-table, or other limited-space installations. Attractive black & ivory color styling.

**Kit AA-191, 7 lbs. . . . . \$15.95**  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**AA-191 SPECIFICATIONS—RECOMMENDED SYSTEM MATES:** Speakers: AS-41, pg. 38; AS-81, AS-193, pg. 38. **Power output:** 3 watts, Heath Utility Rated. **Power response:** ±1 db 60 cps to 15,000 cps at 3 watts output. **Harmonic distortion:** Less than 3% 60-15,000 cps at 3 watts output. **Intermodulation distortion:** Less than 3% at 3 watts output, 60 and 6,000 cps 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 cycles, 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 Mono Combination Amplifier-Preamplifier . . . A Real Value At \$29.95!

- Patented Heath Ultra-Linear® circuit • Music Power rated at 16 watts • 30 to 15,000 cps 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. 32

**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.

**EASY TO OPERATE & BUILD!** Just switch to 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 cps; write for prices.

**AA-13 SPECIFICATIONS—RECOMMENDED SYSTEM MATES:** Speakers: AS-51, pg. 38; AS-10, pg. 37. All turntables, pgs. 34, 35 & 36. **Power output:** 14 watts Heath Hi-Fi Rating; 16 watts IHF Music Power Output (2% THD, 1 kc). **Frequency response:** ±1 db 30-15,000 cps, 14 watts output. **Harmonic distortion:** Less than 2%, 30 cps to 15 kc, at 14 watts output. **Intermodulation distortion:** 2% or less at 14 watts output using 60 and 6000 cps 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 kc; 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 cycles, 55 watts. **Dimensions:** 4 1/8" H x 13 1/2" W x 10 1/2" D.

## Heathkit 30-Watt Mono Amplifier . . . Plenty Of Power & Versatility For Hi-Fi & Public Address Applications!

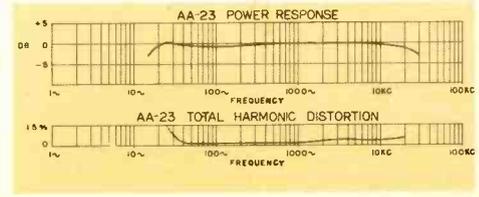
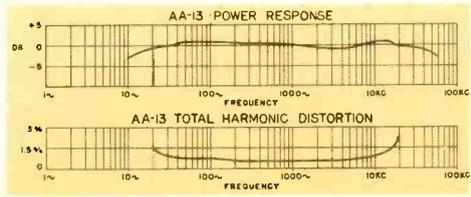
- Hi-Fi rated at 25 watts continuous, 30 watts IHF music power • 4 front-panel selected inputs • Power response ±1 db from 30 to 15,000 cps • Separate bass & treble controls • Ideal for limited-space installations • Mocha brown & beige color styling with black trim . . . matches AJ-63 & AJ-53 tuners, pg. 32

**IDEAL FOR CUSTOM HIGH FIDELITY INSTALLATIONS!** Houses preamp, amplifier, and power supply in one compact "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 & 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 cps; write for prices.

**AA-23 SPECIFICATIONS — RECOMMENDED SYSTEM MATES:** Speakers: AS-2, AS-2A, AS-10, pg. 37; AS-22, AS-51, pg. 38; AS-173, AS-183, pg. 40; AS-163, pg. 41. All changers & turntables, ppg. 34 & 35. **Power output:** 25 watts Heath hi-fi rating; 30 watts IHF music power rating (0.7% THD @ 1 kc). **Frequency response:** ±1 db, 30 cps to 15 kc, at 25 watts output. **Harmonic distortion:** Less than 2%, 30 cps to 15 kc at 25 watts output, and less than 0.7% at 1 kc at 25 watts output. **Intermodulation distortion:** Less than 2% at 25 watts output using 60 cps and 6000 cps 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 kc); 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 cps, 120-135 watts. **Power outlets:** 1 AC receptacle, unswitched. **Indicator:** Neon pilot light. **Dimensions:** 13 1/2" W x 4 1/8" H x 9 1/2" D.



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

STEREO HI-FI

Complete Your Stereo System  
With a Professional Turntable  
From These Famous Names . . .

GARRARD  
DUAL  
REK-O-KUT



ADP-94  
(with cartridge)  
**\$99<sup>51</sup>**



ADP-104  
(with cartridge)  
**\$84<sup>51</sup>**



ADP-24  
(with cartridge)  
**\$99<sup>51</sup>**



ADP-25  
**\$144<sup>90</sup>**  
(less base)

## Garrard's Finest . . . Lab 80 Stereo Automatic Transcription Turntable . . . Insures Professional Reproduction Without Compromise!

- Insures professional reproduction of 33 $\frac{1}{3}$  & 45 rpm records
- Dynamically balanced "Afro-mosia wood" tone arm with integral manual cueing device and adjustable tracking force • New adjustable bias compensator to track the lightest & most compliant cartridges accurately & without distortion • New isolated motor suspension • New anti-static turntable mat • New precision spindle handles up to 10 records of any size • Anti-skate protection

**MORE THAN JUST AN AUTOMATIC TURNTABLE!** The Garrard Lab 80 was created expressly for those who previously have not been willing to accept any automatic unit. It combines new standards of precision, performance & operating convenience not available before in either single play or automatic units.

**COMPARE THESE ADDITIONAL FEATURES!** A Delrin® trip assembly allows the Lab 80 to trip reliably at virtually zero force; a 12" turntable that's statically and dynamically balanced to eliminate wow or rumble; com-

## Garrard Type A70 Automatic Turntable . . . The Ultimate Expression Of Garrard's Famous Pusher-Platform Automatic Record Changing Principle!

- Completely new dynamically balanced tone arm for improved tracking capability & resistance to external shock • New adjustable stylus pressure and tracking force • Full-size heavy-balanced cast "sandwich" turntable • New adjustable bias compensator • New lightweight shell • New ultra-sensitive Delrin® trip assembly • Exclusive pusher platform • Double shielded 4-pole shaded motor

**LUXURIOUS STYLING, ADVANCED FEATURES, SUPERB PERFORMANCE!** With the Garrard Type A70 you enjoy a host of superlative features to handle modern high compliance cartridges, plus a beautiful iridescent charcoal gray color styling that will enhance any hi-fi system. The Type A70 features a special dynamically balanced tone arm with an adjustable counterbalanced weight at the rear to assure accurate tracking and resist external jarring and vibrations. In addition, there are audible/visible check settings on the stylus pressure gauge, plus special needle pivots set into miniature ball bearings that make vertical motion of the tone

## Dual 1009 Auto/Professional Turntable . . . Tracks & Trips At One-Half Gram!

- Automatic tone-arm tracks below  $\frac{1}{2}$  gram, yet trips at zero
- Permits almost 90° tilt without spilling a note • Anti-skate record protection • Automatically shuts off amplifier after play
- Plays up to 10 records with less than 2/10 gram stylus force increase from first to last record • Can also be started manually while record is rotating or at a standstill • 7 $\frac{1}{2}$  lb. dynamically-balanced platter

**NOW A DRAMATIC NEW ACHIEVEMENT** that matches or surpasses standards of performances associated with the costliest professional turntables and separate tone arms . . . the Dual 1009 Auto/Professional Turntable!

**ADVANCED PERFORMANCE FEATURES!** A true dynamically balanced automatic tone arm that not only tracks below  $\frac{1}{2}$  gram, but trips at zero with a mere breath of air! A tone resonance that's barely measurable at 6 or 7 cycles. New utterly silent Dual Continuous Pole® motor that maintains speed accuracy within 0.1% when line voltage varies even beyond 10%. A feather touch slide switch that permits soft-sprung footing to isolate chassis from shock & acoustic feedback. In addition,

## New! Rek-O-Kut Professional Model B-12GH Turntable And Model S-320 Micropoise® Tone Arm For The Dedicated Audiophile!

- 3 speeds . . . 33 $\frac{1}{3}$ , 45, & 78 rpm rim-driven • Ideal for broadcasting studios, professional musicians and audiophiles • Precision-built hysteresis synchronous motor . . . lifetime lubricated
- Includes famous Rek-O-Kut S-320 stereo tonearm with exclusive Omni-Balance

**A FAVORITE OF MUSICIANS, AUDIOPHILES, & AUDIO ENGINEERS EVERYWHERE!** Features a heavy-duty, hermetically oil-sealed hysteresis synchronous motor for locked-in accuracy of rotational speed regardless of power line fluctuation and load; unique self-lubricating, ball-bearing suspension of the micro-finished turntable shaft—the closest approach to friction-free motion; a precision-machined turntable of special aluminum alloys with resonance-inhibiting properties. Model S-320 Micropoise®

pletely isolated 4-pole shaded motor; a 5-point foam-damped spring suspension system which isolates unit from feedback & external jarring; and fingertip tab controls for complete command. Walnut base extra. Choose a special cartridge, pg. 36, for only 1c more, or the new Shure M55E Elliptical Stylus cartridge (\$35.50 value) for only \$10 more!

ADP-94, 25 lbs., turntable only . . . no money dn., \$10 mo. . . . . \$99.50  
ADP-94, 26 lbs., turntable and choice of any 1c offer cartridge  
PG. 36 (specify by model no.) . . . no money dn., \$10 mo. . . . . \$99.51  
ADA-94-1, 1 lb., Garrard LRS9 45 rpm spindle. . . . . \$ 3.80  
ADA-94W, 5 lbs., walnut finished base,  
16 $\frac{1}{2}$ " W x 13 $\frac{3}{4}$ " D x 4 $\frac{1}{4}$ " H. . . . . \$ 6.50

**ADP-94 SPECIFICATIONS—Speeds:** 33 $\frac{1}{3}$  & 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 cycles AC. **Dimensions:** 17" W x 14 $\frac{1}{4}$ " D x 5 $\frac{1}{2}$ " above and 3 $\frac{1}{2}$ " below motor board.

arm virtually frictionless. Type A70 also boasts a foam rubber spring cushion and stereo wired Amplok plug. Completely assembled. Walnut base optional. Choose a special cartridge, pg. 36 for only 1c more, or the new Shure M55E Elliptical Stylus cartridge (\$35.50 value) for only \$10 more!

ADP-104, 23 lbs., turntable . . . no money dn., \$9 mo. . . . . \$84.50  
ADP-104, 24 lbs., turntable with choice of 1c offer cartridge,  
PG. 36 (specify by model no.) . . . no money dn., \$9 mo. . . . . \$84.51  
ADA-61-1, 1 lb. Garrard LRS3 45 rpm spindle. . . . . \$ 3.80  
ADA-63-3, 4 lbs., walnut-base, 16-7/16" W x 13-11/16" D x 3" H. . . . \$ 5.50

**ADP-104 SPECIFICATIONS—Speeds:** 16 $\frac{2}{3}$ , 33 $\frac{1}{3}$ , 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 cycles AC. **Dimensions:** Requires mounting space 16" W., 13 $\frac{1}{4}$ " D., 6" above and 2 $\frac{1}{8}$ " below top of motor board.

the Dual 1009 has a tone arm resonance below 8 cps; anti-skating compensation for 1 gram tracking & below; and a tracking error below 0.4"/inch. The vertical tracking angle increases less than 6° . . . even less than variations from cartridge to cartridge. The Dual 1009 plays all 4 speeds, and has a 7 $\frac{1}{2}$  lb. non-ferrous turntable. Walnut base optional. Choose a special cartridge, pg. 36, for only 1c more, or the new Shure M55E Elliptical Stylus cartridge (\$35.50 value) for only \$10 more!

ADP-24, changer only, 22 lbs. . . no money dn., \$10 mo. . . . . \$99.50  
ADP-24, changer & choice of any 1c offer cartridge PG. 36  
(specify by model no.) 22 lbs. . . no money dn., \$10 mo. . . . . \$99.51  
ADA-24W, oiled solid walnut base, 3 lbs. . . . . \$11.95  
ADA-24-1, 45 rpm spindle, 2 lbs. . . . . \$ 4.80

**ADP-24 SPECIFICATIONS—Speeds:** 16 $\frac{2}{3}$ , 33 $\frac{1}{3}$ , 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:** 10 $\frac{3}{4}$ " x 12 $\frac{3}{4}$ ", 6" clearance above, 3" below. **Power requirements:** 117 VAC, 60 cps.

stereo tone-arm features exclusive Omni-Balance for perfect static and dynamic balance with any cartridge; has tubular aluminum arm with die-cast cartridge shell.

Model ADP-25, turntable & tonearm, 22 lbs. . . . . \$144.90  
no money dn., \$14 mo. . . . .  
Model ADA-25W, walnut base, 10 lbs. . . . . \$18.95

**TURNTABLE SPECIFICATIONS—Speeds:** 33 $\frac{1}{3}$ , 45 & 78 rpm. **Flutter & wow:** .09% rms. **Motor type:** Heavy-duty hysteresis synchronous, life-lubrication. **Color:** Decorator gray and 2-tone aluminum. **Power requirements:** 117 v. AC, 60 cycles AC. **Dimensions:** 17 $\frac{3}{4}$ " wide, 16" deep, height above deck 3", 4 $\frac{1}{4}$ " below. **TONEARM SPECIFICATIONS—Tracking:** 1 gram or less. **Tracking Error:** Less than 1°. **Bearings:** Horizontal & Vertical—chrome steel balls. **Resonance:** 9-12 cps. **Cartridge shell:** Plug-in, 4-wire type.

STEREO HI-FI

# More "Best-Buy" Turntables!

**Garrard AT60 Automatic Turntable . . . Features Efficient**

**Tubular Tone Arm & Oversize Die-Cast Turntable!**



ADP-114  
**\$59.51**  
with 1c  
cartridge

- New automatic bias compensator to track the lightest & most compliant cartridges accurately & without distortion
- New counterweight adjusted, dynamically balanced tone arm
- Built-in stylus pressure gauge legible from top
- Automatic intermix record operation when desired
- Heavy cast, oversize turntable
- Lightweight cut-away shell accepts all cartridges including high compliance models

**HOSTS FEATURES FOUND ONLY ON MORE EXPENSIVE UNITS!** Like the heavy, cast, oversized turntable that's dynamically balanced and non-magnetic. And you'll like the new Garrard iridescent charcoal gray color styling too. Besides the features shown above, the new AT60 has a double shielded 4-pole shaded motor, new tone arm safety catch, new tubular overarm, stereo wired Amplok plug, new super-sensitive Delrin® trip mechanism, and new control panel styling. Choose a cartridge for only 1c more!

ADP-114, 15 lbs., turntable . . . no money dn., \$6 mo. . . . . **\$59.50**  
 ADP-114, 15 lbs., turntable and choice of any 1c offer cartridge below (specify by model no.) . . . no money dn., \$6 mo. . . . . **\$59.51**  
 ADA-114-1, 1 lb. . . Garrard LRS10 45 rpm spindle . . . . . **\$ 3.80**  
 ADA-53W, 3 lbs. . . . walnut finished base . . . . . **\$ 4.95**

**ADP-114 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 cycles AC. **Dimensions:** Requires mounting space 15 $\frac{1}{2}$ " W x 13 $\frac{1}{8}$ " D.,  $\frac{7}{8}$ " above and 2 $\frac{1}{8}$ " below top of motor board.

## Garrard Model 50 . . . An Exceptionally Compact Turntable

**At The Price Of An Ordinary Record Changer!**



ADP-124  
**\$44.51**  
with 1c  
cartridge

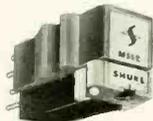
- Plays all four speeds automatically
- Automatically mixes records of different sizes & same speed
- New oversize turntable and handsome mat cover for better record support
- Compact . . . fits "any" cabinet
- New counterbalanced tonearm . . . tracks high quality cartridges
- DuPont Delrin® "frictionless" trip mechanism

**ADVANCED FEATURES & MODERN STYLING AT A MODEST PRICE!** Advanced features like its counterbalanced cast aluminum tone arm with a super-sensitive Delrin® trip mechanism to offset friction and track high compliance cartridges at minimal tracking force . . . a 4-pole shaded motor with a dynamically balanced rotor for constant speed without hum or vibration . . . an oversize turntable with an attractive mat treatment . . . a simple "finger-touch" stylus adjustment . . . a stereo wired Amplok plug . . . new control panel styling . . . a lightweight cutaway-type cartridge shell that can be removed from the arm to instantly change cartridge or service stylus . . . and a compact size that fits virtually any cabinet. Includes line cord, 2 audio cables, & plug-in shell. Handsome, iridescent charcoal gray color styling. Choose a cartridge (below) for only 1c more!

ADP-124, changer only, 10 lbs. . . no money dn., \$5 mo. . . . . **\$44.50**  
 ADP-124, with choice of any 1c offer cartridge below (specify by model no.), 10 lbs. . . no money dn., \$5 mo. . . . . **\$44.51**  
 ADA-114-1, Garrard LRS10 45 rpm spindle, 1 lb. . . . . **\$ 3.80**  
 ADA-53W, Garrard matching base (walnut), 3 lbs. . . . 14 $\frac{5}{8}$ " W x 12 $\frac{3}{4}$ " D x 3" H. . . . . **\$ 4.95**

**ADP-124 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 cycles AC. **Dimensions:** 14 $\frac{1}{4}$ " W x 12 $\frac{1}{2}$ " D x 4 $\frac{1}{8}$ " above and 2 $\frac{1}{8}$ " below top of motor board.

### New! Shure M55E 15° Stereo Dynetic Cartridge With Elliptical Stylus!



Elliptical diamond stylus and new 15° vertical tracking provide near perfect freedom from distortion, resulting in unmatched purity of sound. Low mass. Scratch-proof. Will track at forces of  $\frac{3}{4}$  to 1 $\frac{1}{2}$  grams. Only \$10 when you order with a Garrard Lab 80, Type A70, or Dual 1009 Turntable on pg. 34.

Model AD-95R, 1 lb., no money dn., \$5 mo. . . . . **\$35.50**

**AD-95R MANUFACTURER'S SPECIFICATIONS—**Frequency Response: 20 to 20,000 cps. **Output:** 6.6 mv per channel @ 1 kc. **Separation:** Over 25 db @ 1 kc. **Load impedance:** 47,000 ohms per channel. **Stylus:** Elliptical 0.7 mil diamond. **Compliance:** 25.0 x 10 $^{-6}$  cm/dyne. **Tracking force:**  $\frac{3}{4}$  to 1 $\frac{1}{2}$  grams.

### Special 1c Offer Cartridges With Turntable Offers! specify by model no.

Shure M44-7 15° Dynetic



**AD-85B MANUFACTURER'S SPECIFICATIONS—**Frequency response: 20 to 20,000 cps. **Output:** 11 mv per channel. **Separation:** More than 25 db at 1 kc. **Load impedance:** 47,000 ohms per channel. **Stylus:** .018 mm diamond. **Compliance:** 20.0 x 10 $^{-6}$  cm per dyne. **Tracking force:** 1 $\frac{1}{2}$  to 3 grams. **Model AD-85B, 1 lb. . . . . \$19.95**

New! Sonotone 8TAFHC-SD "Ceramic"



**AD-15K MANUFACTURER'S SPECIFICATIONS—**Frequency response: 20 to 20,000 cps. **Output:** .20 volt. **Separation:** 30 db. **Load impedance:** 1 to 5 megohms. **Stylus:** 0.7 mil diamond, 3 mil sapphire. **Compliance:** 15 x 10 $^{-6}$  cm/dyne. **Tracking force:** 1 .5-3 grams for professional arms; 3-4 grams for changes. **Model AD-15K, 1 lb. . . . . \$7.26**

Certified for optimum performance with 15° RIAA Vert. Tracking Standards.

New! Empire 888 "Magnetic"



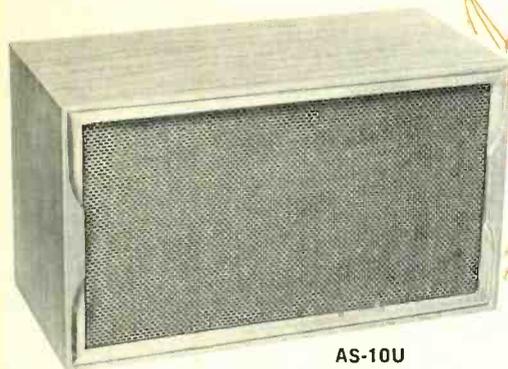
**AD-125G MANUFACTURER'S SPECIFICATIONS—**Frequency response: 12-25,000 cps. **Output:** 8 mv/channel. **Separation:** 30 db. **Load Impedance:** 47,000 ohms. **Stylus:** 0.7 mil diamond. **Compliance:** 10 x 10 $^{-6}$  cm/dyne. **Tracking Force:**  $\frac{3}{4}$ -6 grams. **Tracking Angle:** 15°. **Model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

Pickering V15/AT-2 "Magnetic"

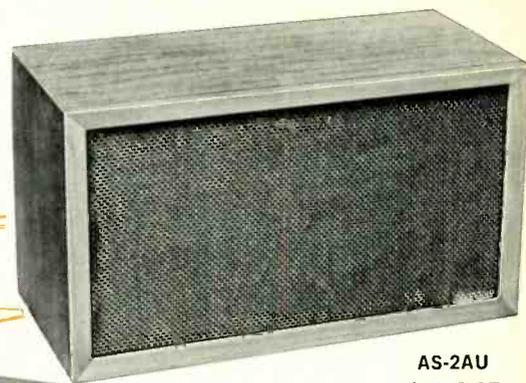


**AD-105J MANUFACTURER'S SPECIFICATIONS—**Frequency response: 20 to 20,000 cps. **Output:** 6.9 mv per cm/sec of recorded level. **Load resistance:** 47,000 ohms. **Stylus:** .7 mil diamond. **Tracking force:** 1 to 4 grams. **Vertical tracking angle:** 15°. **Model AD-105J, 1 lb. . . . . \$19.95**

# Hi-Fi Speaker Systems!



AS-10U  
\$59<sup>95</sup>



AS-2AU  
\$89<sup>95</sup>



AS-2U  
\$69<sup>95</sup>

## An Acoustic Suspension Speaker System That's Easy To Afford!

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

CONSIDER ACOUSTIC SUSPENSION SYSTEMS TOO COSTLY? 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 have made acoustic suspension systems a favorite of audiophiles the world over. And it's yours to enjoy in a space-saving enclosure that costs as little as \$59.95.

WHAT MAKES THIS SYSTEM SO DISTORTION-FREE? The speaker cone is mounted with a very free suspension that marginally provides the elastic restoring force normally required. The full restoring force is then re-introduced via the pneumatic "spring" of air enclosed by the cabinet. The cone literally "rides on air" instead of mechanical springs, thus reducing harmonic distortion.

TOP PERFORMANCE FEATURES! Covers 30 to 15,000 cps, and includes high frequency control and L-C crossover network. Requires only 10 watts to drive, yet handles up to 40 watts. Takes less than an evening to assemble.

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. 19; AA-22, pg. 24; AA-100, pg. 27; AA-151, pg. 29; AA-13 & AA-23, pg. 33; AA-121, pg. 31; AR-13A, pg. 21. Frequency response: 30 to 15,000 cps. 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 cps. Control: High frequency level. Dispersion: 90° horizontal. Cabinet: Factory assembled ¾" furniture-grade plywood. Dimensions: 13½" H x 24" W x 11½" D.

## Versatile Acoustic Suspension System With Components Manufactured By Acoustic Research Inc.!

- 10" acoustic suspension woofer, two 5" cross-fired tweeters manufactured by Acoustic Research, Inc. • Wide-range sound with compact speaker versatility • Easy to build with preassembled cabinet

DISTORTION-FREE ACOUSTIC SUSPENSION IN A COMPACT ENCLOSURE! The AS-2U space-saving cabinet fits just about anywhere, and its famous Acoustic Research, Inc. components provide exceptionally clean tonal quality and wide range response. A 10" acoustic suspension woofer delivers extended bass response with extremely low distortion. And the combination of a 2000 cps L-C crossover network plus specially treated and equalized 5" cross-fired tweeters provide unusually clear high frequency distribution.

EASY TO BUILD . . . YOU ENJOY THE SAVINGS! Simply install the speakers in the preassembled cabinet & connect the leads. Cabinet is unfinished so you can apply the finish of your choice. 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. 19; AA-100, pg. 27; AA-22, pg. 24; AA-23, pg. 33; AA-121, pg. 31; AR-13A, pg. 21. Frequency response: 40 to 15,000 cps. Crossover frequency: 2,000 cps. 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 cps. Crossover: L-C network. Horizontal dispersion: 90°. Size: 24" W x 13½" H x 11½" D.

## Top Value Acoustic Suspension System . . . Added Super Tweeter For Extended Frequency Response!

- Added super tweeter for extended high frequency response • Built-in crossover networks • High frequency level controls • 10" suspension woofer, two 5" cross-fired tweeters, plus 1¾" dome-type super-tweeter—all genuine Acoustic Research, Inc. manufactured units • Pre-assembled cabinets—unfinished or walnut

WHAT MAKES THIS SPEAKER SYSTEM SO DIFFERENT? The addition of a specially-designed super tweeter that extends the already remarkable range of this system to a full 40 to 20,000 cps. For you, this means enjoying distortion-free reproduction over the entire frequency range . . . from the high-pitched shrill of a clarinet to the full impact of a kettle drum . . . with an astounding authenticity you never dreamed possible.

CLEAN, CLEAR BASS RESPONSE WITH LOW HARMONIC DISTORTION. Made possible by the acoustic suspension principle where the woofer cone rides in a cushion of air. This "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 controlled individually by separate level controls. Easy to assemble . . . just mount speakers in preassembled cabinet, wire the crossover network, and fill cabinet with the fiberglass furnished. Choose two for stereo.

Kit AS-2AW (finished walnut), 51 lbs. . . . . No money down, \$10 mo. . . . . \$96.50

Kit AS-2AU (unfinished, white hardboard), 51 lbs. . . . . No money down, \$9 mo. . . . . \$89.95

AS-2A SPECIFICATIONS — Recommended amplifiers: AA-21D, pg. 19; AA-100, pg. 27; AA-22, pg. 24; AA-23, pg. 33; AA-121, pg. 31; AR-13A, pg. 21. Frequency response: ±5 db, 40 to 20,000 cps. Impedance: 8 ohms. Recommended amplifier power: 20 watts minimum. Enclosure: Infinite baffle, sealed. Speakers: Woofer, 10" Acoustic Suspension, 1.1 lb. Alnico 5 magnet; Mid-range, 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 cps. 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.

# Get Full Sound From Your Stereo/Hi-Fi..



## A Slim, Trim, Installs Anywhere... "Profile" 3-Way Hi-Fi Speaker System!

• 3 specially-designed speakers—10", 6", 3½" • 5" slim... ideal for floor, shelf, or wall installation • Factory assembled, tube-tuned bass reflex cabinet, available unfinished or walnut finish

**HAVE A SPEAKER INSTALLATION PROBLEM?** Then consider the Heathkit "Profile." Its slim, compact size lets you set it on the floor, suspend on a wall, or tuck horizontally or vertically in bookcases or on shelves. As for sound, it features a special inverted-design 10" woofer with 1 lb. Alnico magnet to produce frequencies up to the 2250 cps crossover point... a 6" closed-back speaker with a 2 oz. magnet to capably handle the mid-ranges... and a 3½" closed-back tweeter with a 2 oz. magnet to recreate the "highs." The closed-back construction prevents woofer back pressure from causing distortion at the mid-range & high frequencies.

**ASSEMBLES EASILY IN AN HOUR!** Simply mount the individual speakers inside the cabinet, and connect the leads. You enjoy the "do-it-yourself" savings! Both cabinets include felt feet & wall hangers. Choose a pair for the realism of stereo.

Kit AS-22U, unfinished, 35 lbs... No money down, \$5 mo. .... \$49.95  
Kit AS-22W, walnut, 35 lbs... No money down, \$5 mo. .... \$54.95

**AS-22 SPECIFICATIONS**—Recommended amplifiers: AR-13A, pg. 20; AA-22, pg. 24; AA-151, pg. 28; AA-21D, pg. 19; AA-100, pg. 27; AA-23 & AA-13, pg. 33. Frequency response: 55 to 12,500 cps. Crossover frequency: 2250 cps. Recommended amplifier power: 10 to 25 watts. Nominal impedance: 8 ohms. Woofer: 10" special inverted design, 1.1 lb. Alnico V magnet. Mid-range: 6" closed back, 2.15 oz. Alnico V magnet. Tweeter: 3½" closed back, 2.15 oz. Alnico V magnet. Cabinet: Bass reflex, tube-tuned, factory assembled of ¼" furniture grade plywood. Dimensions: 19½" W x 25½" H x 5" D.

## B Low Cost Two-Way Hi-Fi Speaker System... A Favorite Of Thousands!

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

**COMPARE THESE HIGH PERFORMANCE FEATURES!** Covers the 50 to 12,000 cps range at ± 5 db with two specially-designed speakers... an 8" woofer and true compression-type tweeter with exponential horn. A 1600 cps crossover network is built-in, and a control is provided to adjust tweeter power level. Speaker impedance is 16 ohms, and the power rating is 25 watts. Can be used with amplifiers having as little as 3 watts power! A special tweeter mounting board may be rotated for wide angle dispersion in either vertical or horizontal mounting positions. The "Heath-Designed" bass-reflex cabinet comes preassembled either in a walnut veneer or unfinished white hardwood. Assembly takes just an evening... simply mount speakers and wire the crossover network—everything else is prebuilt. Choose a pair for stereo.

Kit AS-51U, unfinished, 28 lbs... No money down, \$5 mo. .... \$39.95  
Kit AS-51W, walnut, 28 lbs... No money down, \$5 mo. .... \$46.95

**AS-51 SPECIFICATIONS**—Recommended amplifiers: AA-32, pg. 30; AA-151, pg. 28; AA-21D, pg. 19; AA-22, pg. 24; AA-100, pg. 27; AA-13 & AA-23, pg. 33. Frequency response: 50 to 12,000 cps. Crossover frequency: 1600 cps. 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.

## C Compact 2-Way, 3-Speaker System!

• 5¾" woofer & two 3" tweeters • Ideal for wall, shelf or table installations • Covers 65-14,000 cps • Factory assembled cabinet, unfinished or walnut finish

**IDEAL FOR SMALL SPACES!** Yet produces a "big-set" sound with a specially-designed 5¾" woofer & two 3" tweeters.

**SIMPLE TO BUILD!** Just mount the speakers in the factory-assembled cabinet. Choose a pair for stereo.

Kit AS-193U, unfinished, 12 lbs. .... \$22.50  
Kit AS-193W, walnut, 12 lbs... No money dn., \$5 mo. .... \$24.95

**AS-193 SPECIFICATIONS**—Recommended amplifiers: AA-32, pg. 30; AA-151, pg. 28; AA-13 & AA-191, pg. 33. Impedance: May be used with amplifier having 4, 8, or 16 ohm output. Frequency range: 65-14,000 cps. Crossover frequency: 4,000 cps. Speaker power rating: 6 watts. Higher rated amplifiers, adjusted for reasonable listening levels, may be used. Adequate room sound with 1 watt to speaker. Nom. woofer size: 5½" cone type. Dimensions: 12¾" H x 15¾" W x 2¾" D.

## D Miniature Hi-Fi 2-Speaker System!

• 6" woofer & 3" tweeter • Quick easy assembly • Pre-assembled cabinets unfinished or walnut finish

**COMPACT SIZE, WIDE-RANGE SOUND!** High compliance type 6" woofer features a mass-loaded cone that's matched to the enclosure for unusually good bass response. Closed-back 3" tweeter prevents speaker interaction. Simple to assemble... just install speakers, crossover network & voice coil leads.

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

**AS-81 SPECIFICATIONS**—Recommended amplifiers: AA-32, pg. 30; AA-13 & AA-191, pg. 33; AA-151, pg. 28. Frequency response: From 70 to 14,000 cps. Crossover frequency: 4000 cps. 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 #6 magnet. Crossover: Capacitor type.

## E Low Cost Hi-Fi Speaker System!

• 6" x 9" extended range dual-cone speaker • Compact, easy to assemble & install • Covers 70-16,000 cps • Preassembled cabinets, unfinished or wanut finish

**READY TO SERVE YOUR HI-FI SYSTEM IN A VARIETY OF WAYS!** Use as a low cost speaker in an extra room... an extension speaker to other rooms... or as a center fill in for a stereo system.

Kit AS-41U, unfinished, 9 lbs. .... \$10.95  
Kit AS-41W, walnut, 9 lbs. .... \$12.95

**AS-41 SPECIFICATIONS**—Recommended amplifiers: AA-32, pg. 30; AA-151, pg. 28; AA-191 & AA-13, pg. 33. Frequency response: 70 to 16,000 cps. 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.

# Choose A Heathkit® Speaker System!



## "Legato Compact" . . . For The Audiophile Who Demands The Finest In Music Reproduction!

• Speakers cover 30-22,000 cps • 800 cps 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

**MASTERPIECE OF PERFORMANCE, STYLING & QUALITY!** Known by audiophiles everywhere for its acoustical excellence . . . known by audio engineers as an achievement in sound technology. How did the famous Legato Compact obtain this excellent reputation? Your ears will tell you once you hear its superb performance.

**WHAT MAKES THIS PERFORMANCE POSSIBLE?** To start with, the AS-21 uses two Altec Lansing "high compliance" low-frequency speakers that cover the 30 to 800 cps range with a rich, full-bodied tone. Next, a specially-designed Altec Lansing exponential horn and high frequency driver combination is incorporated that recreates the 800 to 22,000 cps frequency range with complete fidelity and brilliance. The special 800 cps crossover network is factory assembled, ready for installation in the carefully crafted, acoustically correct cabinet.

**EFFICIENT & ATTRACTIVE!** The Legato Compact easily allows you to use amplifiers with a power output as low as 3 watts . . . yet is capable of handling program material of 30 watts.

And the handsome factory-assembled walnut-finished cabinet is sturdily constructed of ¾" furniture grade plywood . . . makes a luxurious addition to any room. Its modern styling matches the AE-20 hi-fi equipment cabinet on pg. 42.

If you want the finest in a hi-fi speaker system, then the Legato Compact is your choice!

Kit AS-21W, walnut, 142 lbs., no money dn., \$22 mo. **\$239.95**  
 Kit AS-31, everything except cabinet, 54 lbs. . . .  
 no money dn., \$18 mo. . . . . **\$184.95**

**AS-21 SPECIFICATIONS** — Recommended amplifiers: AR-13A, pg. 20; AA-21D, pg. 19; AA-22, pg. 25; AA-100, pg. 27. Frequency response: 30 to 22,000 cps. 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 cycle exponential horn and driver, .53 lb. magnet. Crossover: 800 cycle 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  
**\$239<sup>95</sup>**



**HIGH FREQUENCY DRIVER** and specially designed exponential horn by Altec Lansing with .53 lb. magnet . . . covers 800 to 22,000 cps . . . provides 90° horizontal distribution.

**LOW FREQUENCY SPEAKERS** by Altec Lansing . . . famous, high compliance 12" speakers with 1½ lb. magnets . . . cover 30 to 800 cps.

**CROSSOVER NETWORK** by Altec Lansing . . . 800 cps constant K shelving type.

## Accessories For Private 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 noises . . . 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 cps. Impedance: 8 ohms for use with 3 to 16 ohm sources. Power input: 15 milliwatts, 1 watt maximum. Cord: 4-wire 12 ft. long with spade terminals. Color: Tan and brown.

ADP-92  
**\$23<sup>92</sup>**



### 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 1½ hours. Compact size . . . 3" W x 6" D x 3¼" H . . . fits anywhere! For more relaxed "private" listening, order yours now!

Kit AC-13, 3 lbs. . . . . **\$9.95**

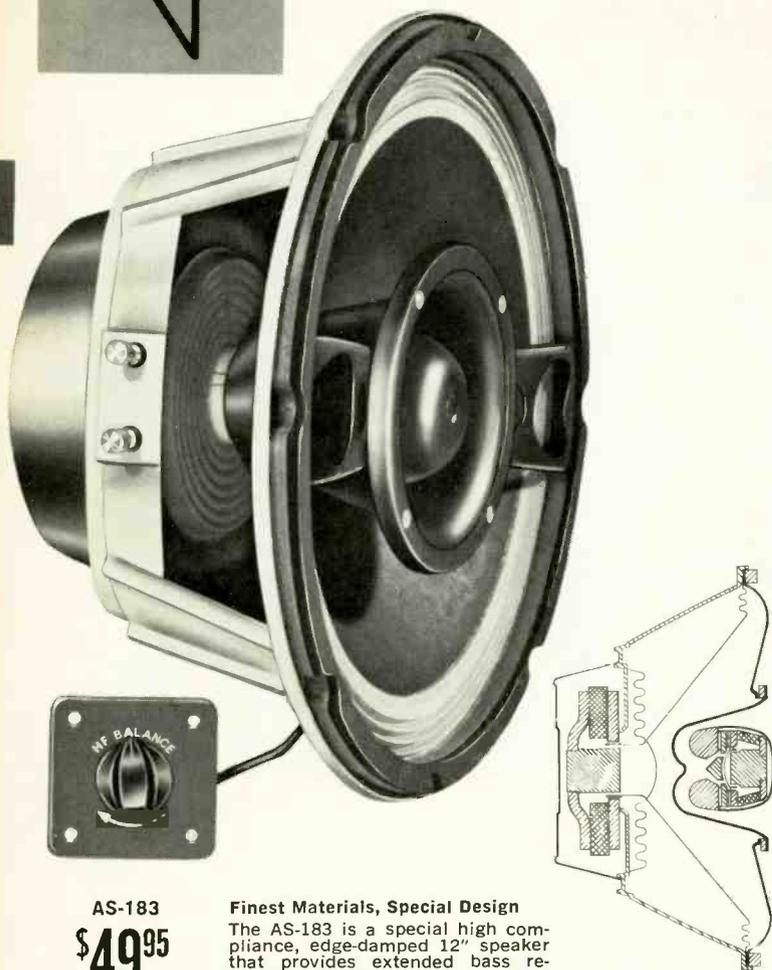


AC-13  
**\$9<sup>95</sup>**

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

STEREO HI-FI

# Need Speakers For a Custom Installation



AS-183  
**\$49<sup>95</sup>**  
 (\$95.00 PAIR)

**Finest Materials, Special Design**  
 The AS-183 is a special high compliance, edge-damped 12" speaker that provides extended bass response . . . down to 20 cps. Has special ceramic annular-ring magnet for extra power handling capability. Sturdy high frequency unit is the reflexed horn type. Its massive die-cast metal frame adds extra rigidity insuring precise alignment of speaker elements.

## Ready For The Best? Choose This Deluxe 12" Two-Way High Compliance, Edge-Damped Hi-Fi Speaker . . . Extended Bass Response!

EVERY ADVANCED FEATURE, PLUS THE FINEST MATERIALS available have been incorporated into this superb speaker to insure fine sound reproduction . . . a lifetime of "concert-hall" performance. A smooth 20-15,000 cps response is assured with a high compliance edge-damped woofer cone, low crossover frequency, and reflexed horn high frequency unit . . . provides astounding realism! YEARS AND YEARS OF FLAWLESS REPRODUCTION are assured with the heavy die-cast frame for precision alignment of all elements, high efficiency 1¾ lb. ceramic ring magnet, and highest quality materials. Additional features include 1½" & 1" voice coils, separate high frequency level control, and polarized speaker terminals for proper phasing. Beautiful 2-tone cinnamon and tan color styling . . . attractive enough to mount out in the open! Includes a full 1-year guarantee and cabinet recommendations! For a sound that will delight the most critical ear, choose this masterfully-crafted speaker now!

Model AS-183, 15 lbs. . . no money dn., \$5 mo. . . . . \$49.95  
 Model AS-183-2, 30 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 cps. Cone resonance: 25 cps. Magnet weights: 1¾ lbs., 4.65 oz.

## There's A Quality Speaker To Fit Your Particular Music System Needs In This Exclusive Heath Series!

- Specially designed to rigid Heath specifications
- Massive die-cast metal frames for extra strength
- Special ceramic annular ring magnets for superior performance
- Polarized speaker terminals for proper phasing
- Attractive 2-tone cinnamon and tan color styling
- All speakers include cabinet recommendations
- Full 1-year guarantee on all models

**A CUSTOM SPEAKER FOR ANY SYSTEM NEED!** Is your present set of speakers capable of efficiently reproducing the improved sound of today's advanced stereo/hi-fi components? With this exclusive Heathkit speaker series you choose from a versatile selection of speakers that are specially designed to handle the improved characteristics of modern stereo equipment.

Whatever your particular speaker needs . . . from a TV or radio speaker replacement to an up-to-date professional speaker . . . there's a Heathkit model to fill it. Each speaker is carefully designed to do particular jobs. Each speaker is engineered to perform at peak efficiency for many years to come. Each speaker is completely assembled, ready to install immediately. Each speaker is priced to offer you the most for your money. Compare their features and specifications with others! Then choose wisely . . . choose a Heathkit custom speaker!



AS-173  
**\$39<sup>95</sup>**  
 (\$76.00 PAIR)

## 12" Deluxe Three-Way High Compliance, Edge-Damped Hi-Fi Speaker . . . Handles Up To 25 Watts

EVERYTHING YOU COULD ASK FOR IN A SPEAKER AND MORE! Superb reproduction throughout the entire frequency range of 35 to 15,000 cps a high compliance edge-damped woofer cone for rich, deep bass . . . a high frequency cone for mid-range realism and presence . . . a special Heath designed tweeter for clear-as-a-bell highs . . . polarized speaker terminals for proper phasing!

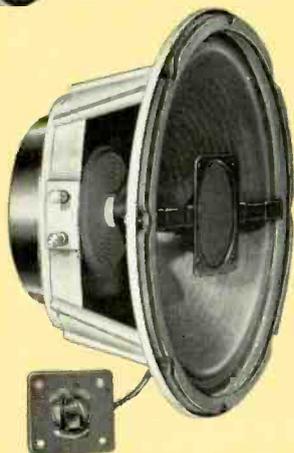
**HANDLES UP TO 25 WATTS PROGRAM MATERIAL** with a 1¾ lb. ceramic annular-ring magnet. The crossover networks are built-in, and a separate high frequency level control permits adjustment to suit room acoustics. Features heavy die-cast metal frame for years of faithful service, 1½" & 1" voice coils and the finest materials throughout! Handsomely styled in 2-tone cinnamon and light tan. Includes cabinet recommendations and 1-year guarantee. This speaker will fill every hi-fi listening need and provide thrilling full-range sound reproduction . . . all at a small 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 cps. Cone resonance: 40 cps. Magnet weights: 1¾ lbs., 2½ oz.

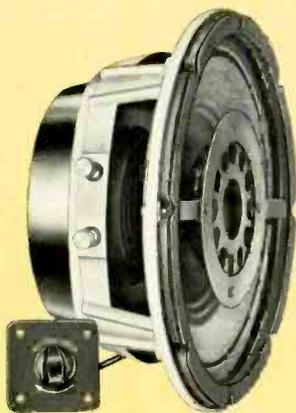
# Order a Pair And Save!



AS-163  
**\$29<sup>95</sup>**  
 (\$57.00 PAIR)



AS-153  
**\$19<sup>95</sup>**  
 (\$38.00 PAIR)



AS-133  
**\$14<sup>95</sup>**  
 (\$28.50 PAIR)



AS-123  
**\$9<sup>95</sup>**  
 (\$19.00 PAIR)

## 12" Deluxe Three-Way Coaxial Hi-Fi Speaker . . . Fills A Host of Hi-Fi Applications!

**SUPERBLY ENGINEERED TO REPRODUCE 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. In addition, mechanical and electrical crossover networks provide smooth sound transition. Polarized and color-dot coded speaker terminals assure proper phasing with your system.

**ATTRACTIVELY STYLED IN CINNAMON AND LIGHT TAN!** Handsome enough to mount out in the open. Has a separate high frequency level control for the horn-type tweeter. Includes cabinet recommendations. Not a kit. 1-year guarantee. Choose 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 down, \$6 mo. . . . . **Special Pair Price \$57.00**

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

## 12" Two-Way Coaxial Hi-Fi Speaker . . . A Budget Stretcher Bargain!

**HOW TO SAVE ON A QUALITY-BUILT 2-WAY COAXIAL SPEAKER!** Choose the AS-153. The AS-153's true coaxial design features a separate woofer and tweeter with a built-in capacitive crossover network. A separate high frequency level control permits balancing of "highs" and "lows" to fit room acoustics. And the rigid die-cast frame maintains accurate alignment of all speaker elements.

**HANDLES UP TO 15 WATTS AND COVERS 50 TO 15,000 CPS!** And the polarized binding posts are color coded for proper phasing and easy connection to your amplifying system. Beautiful cinnamon and light tan color styling make an attractive addition to any room. Includes recommended cabinet dimensions, 1-year guarantee. Not a kit. Purchase a pair for stereo!

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

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

## 8" Two-Way Coaxial High Fidelity Speaker . . . Ideal For Small Space Enclosures!

**TOP VALUE IN AN 8" SPEAKER!** The AS-133 features a separate woofer and tweeter for true coaxial performance, plus a built-in capacitive crossover network. Also has a separate high frequency level control for balancing the "highs" and "lows". Boasts a 10 oz. annular-ring ceramic magnet for extra power handling ability, and a die-cast frame for a lifetime of dependable performance. In addition, there are color-dot coded binding post terminals for easy phasing, and handsome cinnamon and tan color styling.

**MEASURES ONLY 3 5/8" DEEP!** Ideal for small-space enclosures. Handles up to 12 watts of program material, and covers 50 to 14,000 cps. Complete with multi-speaker connection instructions and recommended cabinet dimensions. Guaranteed for 1 full year. Choose a pair for stereo, and enjoy extra savings! Not a kit.

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 cps. Cone resonance: 70 cps. Magnet weights: 10 oz., 0.68 oz. Voice coil sizes: 1" and 9/16".

## 8" Dual-Cone Hi-Fi Speaker . . . Space Saver!

**HERE'S AN EXCELLENT SPEAKER FOR LIMITED-SPACE APPLICATIONS.** The AS-123 features a husky, die-cast frame for extra rigidity of speaker elements, plus a dual-cone design for wide frequency range . . . 50 to 12,000 cps. In addition, there are color-coded binding post terminals to insure proper phasing; and a 10-ounce annular-ring magnet to handle up to 12 watts of program material.

**SLIM 3 1/2" DEPTH IDEAL FOR IN-WALL MOUNTING!** Or any other small enclosures such as shallow cabinets, etc. Cinnamon and light tan color. Comes complete with cabinet recommendations, multi-speaker connection instructions, and 1-year guarantee. Not a kit. Enjoy extra savings by ordering two for stereo.

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 cps. Cone resonance: 70 cps. Magnet weight: 10 oz. Voice coil size: 1".

*You Get Twice As Much For Your Budget With Heathkit*

STEREO HI-FI

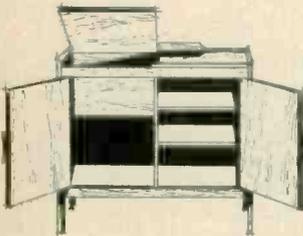
# Luxurious Stereo/Hi-Fi Furniture . . .



Complete System  
HFS-75  
**\$531<sup>39</sup>**



## Deluxe Heath Stereo/Hi-Fi Cabinetry ... Styled To Complement Modern Furnishings!



- 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** CLEAN, FLOWING LINES . . . "SCULPTURED" ACCENTS! This skillfully crafted AE-20 equipment cabinet is a masterpiece of sumptuous furniture you'll be proud to place in your home. It is solidly constructed of fine furniture woods which are accented with clean, eye-arresting relief touches. Slim, curved brass door handles highlight the "sculptured" effect. And the modern walnut finish adds a richness that reflects your good taste. Comes completely assembled, ready to accommodate your stereo/hi-fi components.

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

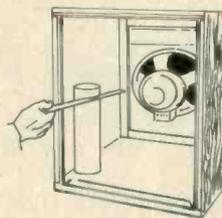
**AE-20 EQUIPMENT ACCOMMODATIONS AND SIZES**—Cabinet, overall: 36" W x 32 3/8" H x 19" D. Changer compartment: 17" W x 15 1/4" D, mounting board is uncut and can be adjusted in height to accept all record changers sold by Heath; lid has adjustable friction-loaded support. Record-tape recorder compartment: 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 preamplifier or stereo or mono combination amplifier. Power amplifier compartments: 8 3/4" H x 17" W x 15 1/8" D inside, accepts any Heathkit stereo or mono amplifier.



### 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.

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



### **B** Matching Deluxe Speaker Cabinet!

MATCHES THE AE-20 IN STYLING, BEAUTY! 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 5/8" x 10 3/16" slot for a horn tweeter.

AND YOU CAN MATCH THE AE-40 WITH ANY 12" OR 15" SPEAKER FOR BEST TONE! You achieve a perfect cabinet-to-speaker match

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 speaker, 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 cps, so the tube length reading is 6". You then cut the pre-installed tube to 6" (see above illustration). That's all there's to it . . . you have a perfect speaker-to-cabinet match!

PREASSEMBLED, READY FOR SPEAKER INSTALLATION! Overall dimensions: 18 1/2" W. x 19" D. x 32 3/8" H. Order a pair for stereo now!

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

### 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-94 Garrard Lab 80 Automatic Stereo Turntable with choice of 1c cartridge, pg. 34, \$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

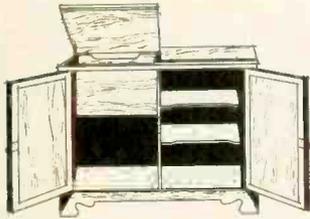
Complete System Kit HFS-75  
Reg. . . . . \$559.36  
Save 5% . . . . . \$ 27.97  
You Pay Only . . . . . \$531.39

# Adds Elegance To Any Room!



## Exclusive Heath "Early American" Stereo/Hi-Fi Furniture

.. For A Touch Of Our Proud Heritage!



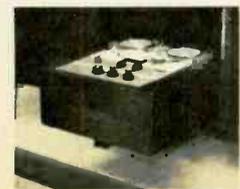
- Custom designed for Heathkit components
- Holds most hi-fi/stereo components
- Stunningly styled in a special Heathkit motif
- Luxuriously finished in fashionable salem-maple
- Factory-assembled, ready to use

**☐ 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, 77 lbs. . . no money dn., \$11 mo. . . . . \$115.00

**AE-13S EQUIPMENT ACCOMMODATIONS AND SIZES:** Cabinet, overall: 28" H x 36" W x 18 1/4" D. **Changer compartment:** 17" W x 16" D x 5 1/4" 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:** 14 3/4" H x 17" W x 17 1/4" D for record storage; space is convertible with accessory sliding drawers to accommodate tape recorder. **Shelf compartments:** Top shelf, 6 1/4" H x 17" W x 15 1/2" D. Middle shelf, 6" H x 17" W x 15 1/2" D. Bottom shelf, 9" H x 17" W x 17" D. Shelves accept any Heath stereo or mono tuner, stereo or mono preamplifier, or stereo or mono combination amplifier.



### 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 16 1/2" D., wood 1/2" thick. Model AEA-13-1, uncut recorder drawer, 16 lbs. . . . . \$20.00

### ☐ Matching Speaker Cabinet!

**MATCHES THE AE-13S EQUIPMENT CENTER IN STYLING, QUALITY AND FINISH.** Handles 12 or 15 inch speakers, and has a 3 3/8" x 10 3/16" slot for horn tweeter. Tube-vented design allows simple cabinet-to-speaker matching—see opposite page for example. Completely factory assembled and finished. Measures 18 1/4" W. x 18 3/4" D. x 28" H. Use of attractive spindle grille optional. Order a matching pair for stereo now! Model AE-23S, 55 lbs. . . no money dn., \$6 mo. . . . . \$55.00

### Save \$34.57 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-24 Dual 1009 Automatic Stereo Turntable with choice of 1c cartridge, pg. 34, \$99.51

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-76**  
 Reg. . . . . \$691.41  
 Save 5% . . . . . \$ 34.57  
**You Pay Only . . . . . \$656.84**



# NEW 1966 SONY STERECORDERS!



GDP-184B  
\$179<sup>00</sup>

## New Sony Model 200-B Portable Sterecorder . . . Compact Size, King-Size Performance!

- 4-track stereo & mono record & playback at 7½ & 3¾ ips
- Full-range stereo speaker system • Sound-on-sound recording capability • Dynamically balanced capstan flywheel • Two V.U. meters • Automatic Tape Lifter • Pause control and digital tape counter • Full 7" reel capacity • FM stereo inputs • Built-in Stereo preamplifiers & power amplifiers

DESIGNED FOR HOME OR PORTABLE USE! That's the new Sony 200-B Sterecorder with detachable speakers that can be placed up to 15 ft. apart . . . achieves stereo reproduction in all its grandeur.

COMPARE ITS FEATURES! Boasts 4-track stereo and mono record and playback for complete operating versatility . . . Full range 2-speaker stereo system that combines to form carrying case lid . . . Sound-on-sound individual push button selection of channel 1 or 2 enables inter-channel transfer for multiple track or special effects recording . . . Dynamically balanced capstan flywheel with advanced "rim drive" principle—no belts

**"Suitcase" Portability**  
2-speaker stereo system combines to form carrying lid . . . separate up to 15' for maximum stereo effect. AC operation only.



to stretch or wear out . . . Two V.U. meters to assure accurate indication of recording level . . . Automatic tape lifter to protect heads from wear during fast forward & rewind operation . . . Pause control & digital tape counter for precise cueing, editing & tape indexing . . . Full 7" reel capacity . . . FM stereo inputs to record "off-the-air" from your FM stereo tuner . . . and built-in stereo preamplifiers and power amplifiers that can be used with external sound systems or as a public address system. Complete with portable carrying case & 2 Sony F-96 dynamic microphones. Not a kit.

Model GDP-184B, 53 lbs. . . No money down, \$17 mo. . . . . \$179.00

**GDP-184B SPECIFICATIONS**—Power requirements: 70 watts 117 volts, 60 cycles (50 cycles optional). Tape speeds: 7½ and 3¾ ips. Frequency response: 50-14,000 cps @ 7½ ips; 50-10,000 cps @ 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.

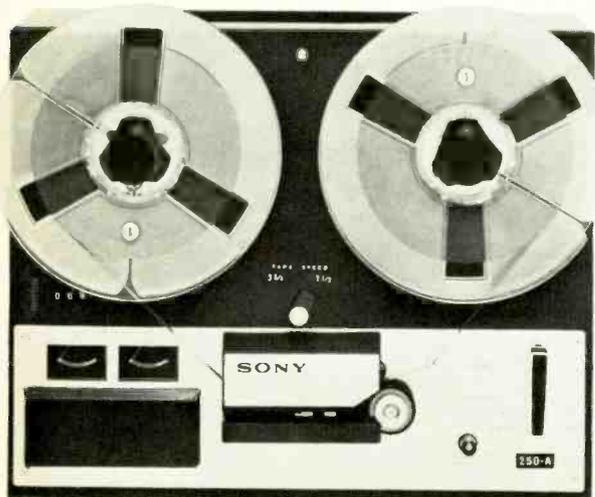
## New Sony 250-A All-Transistor Sterecorder . . . Instant Operation, Long Life, Low Cost!

- 4 track stereo & mono record & playback at 7½ & 3¾ ips
- All-transistor for instant operation, compact size • Operates in both horizontal or vertical positions • Two V.U. meters • Automatically shuts itself off at end of reel • Dynamically balanced capstan flywheel • Automatic tape lifter • Simple single-knob operation for all functions • Attractive walnut cabinet-base

NOW FOR LESS THAN THE COST OF A GOOD RECORD CHANGER, you can enjoy an exciting new dimension in home entertainment . . . the quality performance of Sony 4-track stereo & mono tape recording & playback. And besides reproducing already-recorded music with greater authenticity, you'll soon recoup your investment by recording your own stereo collection directly from your FM stereo tuner and favorite records.

ADVANCED FEATURES FOR COMPLETE OPERATING VERSATILITY! This new 4-track stereo & mono tape deck features both record & playback preamplifier; all transistor circuit for cool, instant operation; single knob for control of all functions; both vertical & horizontal operation; automatic tape lifter that protects heads from wear during fast record & rewind; and dynamically balanced capstan flywheel . . . no belts to stretch or wear out. The recording control microphone inputs, and record interlock are recessed under a hinged panel for a modern, professional appearance. Walnut cabinet base included. Not a kit.

Model GDP-174A, 17 lbs. . . No money down, \$12 mo. . . . . \$129.00



GDP-174A  
\$129<sup>00</sup>

**GDP-174A SPECIFICATIONS**—Power requirements: 115 volts, 60 cycles (50 cycles optional). Tape speeds: 7½ and 3¾ ips. Flutter & wow: 0.19% @ 7½ ips; 0.25% @ 3¾ ips. Frequency response: 50-14,000 cps @ 7½ ips. Signal to noise ratio: 50 db or more. Level indication: 2 VU meters. Inputs: Microphone and line per channel. Outputs: High level line per channel. Dimensions: 14½" W x 6½" D x 9" H.

# VHF FM Monitorradios!



For An Exciting New Listening Experience, Choose One Of These

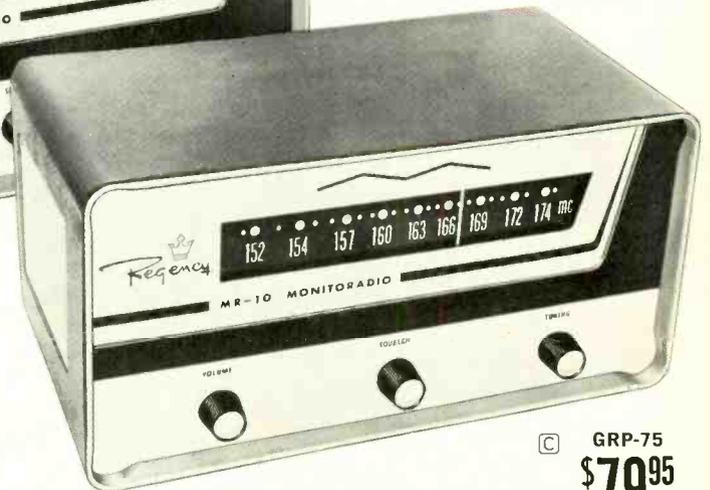
*Regency* Monitorradios . . . Famous For Professional Quality & Performance!



**A** GRP-45  
**\$79.95**



**B** GRP-55  
**\$79.95**



**C** GRP-75  
**\$79.95**

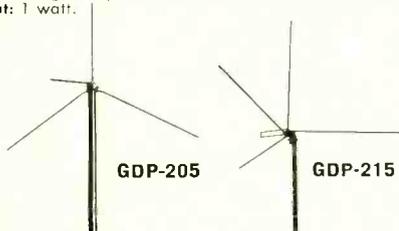
## **A** *Regency* Aircraft Flight Monitorradio!

- Covers 108 to 136 mc • 3-gang condenser with nuvistor RF amplifier for 1 uv sensitivity • Adjustable squelch for full quieting • Built-in 5" speaker • Fully tuned RF stage for better image rejection • Illuminated slide-rule dial • External speaker provision • Power transformer • Vinyl laminated leather-grained scratch & marproof metal cabinet • Not a kit

**FOR THE SERIOUS AVIATION ENTHUSIAST!** Hear aircraft, control towers, approach control, radar approach, ILS, Unicom, Omni-range . . . the whole exciting panorama of America in flight. Outperforms "commercial grade" aircraft receivers. Provides increased sensitivity . . . a stronger, clearer signal . . . improved signal-to-noise ratio . . . reduced oscillator radiation. Measures 12" W x 6 1/4" H x 6 3/8" D.

Model GRP-45, 14 lbs., No money down, \$8 mo. . . . . **\$79.95**

**GRP-45 SPECIFICATIONS:** Frequency: 108-136 mc. Sensitivity: 1 uv for 10 db S + N/N at 30% modulation. Squelch range: Adjustable from .5 uv to 100 uv. Power output: 1 watt.



**HY-GAIN GP-150 1/4 WAVELENGTH UNITY GAIN GROUND PLANE ANTENNA!** Ideal for both GRP-45 & GRP-75 Monitorradios. Frequency adjustable from 108 thru 500 mc. Withstands winds up to 100 mph. Iridite treated bracket & hardware. Model GDP-205, 3 lbs. . . . . **\$5.40**

## **B** *Regency* Model MR-33B FM Monitorradio!

- Covers 30 to 50 mc • Full tuned RF stage insures better image rejection • Built-in 5" speaker • 3-gang condenser • 7 tube circuit with rectifier • Built-in adjustable squelch for complete quieting • Provision for external speaker or headphones • Illuminated slide-rule dial for quick, easy station tuning • Power transformer • UL approved • Not a kit

**WIDEN YOUR LISTENING HORIZONS!** With this quality engineered special-purpose radio, you keep posted on the latest happenings on power utility, industrial, highway maintenance, forestry, private mobile telephone and radio paging frequencies as well as fire and police calls. Completely assembled. Measures 7 7/8" x 11 1/4" x 6 1/2".

Model GRP-55, 14 lbs., No money down, \$8 mo. . . . . **\$79.95**

**GRP-55 SPECIFICATIONS:** Frequency: 30-50 mc. Sensitivity: 4.0 uv or better for 20 db quieting. Squelch: 2.0 uv (adjustable). Power output: 0.8 watt @ 10% distortion.

**HY-GAIN GP-50 1/4 WAVELENGTH UNITY GAIN GROUND PLANE ANTENNA!** Ideal for GRP-55 Monitorradio (above). Omni-directional. Covers 27-50 mc. Withstands winds up to 80 mph. Model GDP-215, 6 lbs. . . . . **\$12.95**

## **C** *Regency* Model MR-10B FM Monitorradio!

- Covers 152-174 mc • 7 tube circuit with rectifier • Fully tuned RF stage for better image rejection • 3-gang condenser • Built-in 5" speaker • Reliable built-in, all-electronic squelch • Provision for external speaker or headphones • Illuminated slide-rule dial for nighttime operation • Power transformer • Listed by Underwriters' Laboratories • Not a kit

**A NEW WORLD OF INTRIGUING LISTENING!** Just look at the exciting array of broadcasts you can hear with this superb receiver . . . civil defense, police and fire department calls, U.S. Weather Bureau broadcasts, railroads, taxis, private mobile telephone, power utilities, forestry and other emergency services! Comes completely assembled. Just plug into any AC receptacle to enjoy its informative and entertaining coverage. Measures 7 7/8" x 11 1/4" x 6 1/2".

Model GRP-75, 14 lbs., No money down, \$8 mo. . . . . **\$79.95**

**GRP-75 SPECIFICATIONS:** Frequency: 152-174 mc. Sensitivity: 4.0 uv or better for 20 db quieting. Squelch: 2.2 uv (adjustable). Power output: 0.8 watt @ 10% distortion.

## Heathkit IM-11 VTVM ... Has Set The Standards For Price, Accuracy And Versatility For More Than A Decade

- Single AC/Ohms/DC probe for all measurements • 7 AC, 7 DC & 7 Ohms ranges • Easy to read 4½" 200 UA meter • 1% precision resistors for extremely accurate readings • Extended low frequency response ±1 db from 25 cps to 1 mc • Simple to build & operate

CHART THE COURSE OF THE HEATHKIT VTVM THROUGHOUT THE PAST 16 YEARS! You'll discover a price difference of only 45c. Yet you'll discover a big difference in performance ... an up-to-date performance that meets the servicing needs of the modern technician.

For example, the meter movement has changed from 500 ua to 200 ua to improve sensitivity ... the minimum voltage range was lowered from 3 volts to 1.5 volts ... there are now 7 AC/DC/Ohms ranges instead of 6 ... the meter has been enlarged to 4½" for easier reading ... a voltage doubler rectifier replaced the half-wave rectifier for peak-to-peak response ... a single test probe instead of two for all readings simplifies operation ... and circuit board construction now provides greater stability, easier assembly.

Although the basic compact shape & size has changed very little, the color styling has been modernized for a more attractive appearance. And we have kept the same shatterproof meter cover. Many refinements, many improvements ... all for only 45c more than the 1949 price! Just another example of the constantly improving value you expect from Heath.

NOW 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.

And the slim, all-purpose test probe permits switch-selection of AC-Ohms or DC functions, and is equipped with a miniature "hook" which permits clipping the probe to the component leads for "hands-free" operation.

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 cps; 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: 0.4, 14, 40, 140, 400, 1400, 4000. Resistance: 10 ohm center scale x1, x10, x100, x1000, x10k, x100k, x1 meg. Measures .1 ohm to 1000 megohms with internal battery. Meter: 4½" 200 ua movement. Multipliers: 1% precision type. Input resistance DC: 11 megohms (1 megohm in probe) on all ranges. Circuit: Balanced bridge (push-pull) using twin triode. Accuracy: DC ±3%, AC ±5% of full scale. Frequency response: ±1 db, 25 cps to 1 mc (600 ohm source). Tubes: 12AU7, 6AL5. Battery requirements: 1.5 volt, size "C" flashlight cell. Power requirements: 105-125 volt 50/60 cycle AC, 10 watts. Dimensions: 7¾" H x 4-11/16" W x 4¾" D.



Kit Form  
or  
Factory  
Assembled

Kit  
\$24<sup>95</sup>  
Wired  
\$39<sup>95</sup>



### 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.

Kit Form or  
Factory Assembled

### Etched Circuit RF Probe Kit

This handy RF probe may be used with any 11 megohm VTVM for RF measurements up to 250 megacycles. 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

309-C  
\$3<sup>50</sup>

Kit Form or  
Factory Assembled

### 30,000 Volt DC High Voltage Probe Kit

Invaluable for TV service work or any other application where extremely high DC voltages are measured. Provides a multiplication factor of 100 on the DC ranges of any 11 megohm VTVM. Two-color sleek plastic probe body provides plenty of insulation for safety.

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

336  
\$4<sup>50</sup>

# Accuracy At Lowest Cost



Kit  
**\$32<sup>95</sup>**

Wired  
**\$49<sup>95</sup>**

Kit Form  
or  
Factory  
Assembled

## Where More Performance Means More Income To You ... Outfit With The Deluxe Service-Bench VTVM

- 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

**NEED A VACUUM TUBE VOLTMETER FOR SHOP SERVICING?** Then consider the Heathkit IM-13. It's engineered right, shaped right, priced right for your "in-shop" servicing needs. 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 con-

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

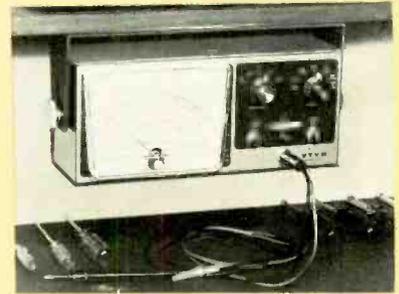
**AVAILABLE IN KIT OR FACTORY ASSEMBLED FORM!** No matter which version you choose, you enjoy big savings over comparable units. If you choose the IM-13 kit, you enjoy *extra* savings while having fun . . . the fun of "do-it-yourself." And with famous Heathkit step-by-step instructions and conventional wiring, your IM-13 goes together quickly and easily. The factory assembled IMW-13 is ready to go to work immediately . . . simply install 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, 8 lbs. . . . \$49.95**  
 No money down, \$5 mo. . . . . \$49.95  
 Export model available for 115/230 VAC, 50-60 cps; 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:**  $\pm 1$  db 25 cps to 1 mc (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 3 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.



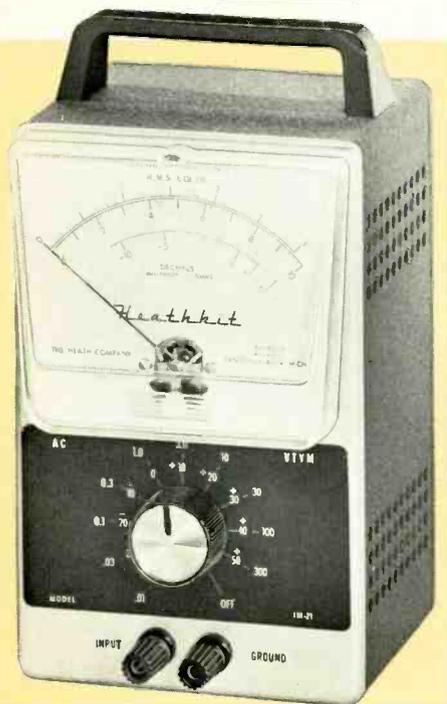
**SPACE SAVING CONVENIENCE**  
 The IM-13 easily mounts under a shelf at eye-level reading position for greater convenience. Bracket holds meter securely in any position.

*You Get Twice As Much For Your Budget With Heathkit*



# Precision Test Equipment

Kit Form or  
Factory Assembled



Kit  
**\$33<sup>95</sup>**

Wired  
**\$52<sup>95</sup>**

## Heathkit Laboratory AC VTVM . . .

**For Precision AC Measurements**

- 10 voltage ranges—0.01 to 300 volts RMS full scale
- Extended frequency response,  $\pm 1$  db from 10 cps to 500 kc
- 10 megohm input impedance for high accuracy
- Calibrated DB scale for audio measurements

**PLUS FEATURES FOR PRECISION AC MEASUREMENTS!** That's what you get with the Heathkit IM-21 AC Vacuum Tube Voltmeter! A precision voltage divider provides 10 AC ranges, 10 millivolts to 300 volts RMS full scale . . . ideal for audio design and development work, laboratory use, or general servicing. Features cathode follower stage on all ranges to provide a 10 megohm input impedance to measure voltages in sensitive circuits without appreciable loading . . . provides greater accuracy! Has a two-stage amplifier with approximately 19 db of negative feedback for high output stability and linearity. And the meter features VU-type ballistic damping . . . ideal for monitoring audio signals in such applications as tape recording and audio system measurements! The power supply consists of a half-wave rectifier circuit, containing a modern silicon rectifier. In order to minimize hum, the filament winding of power transformer is balanced to ground.

**ATTRACTIVE PRACTICAL STYLING!** The IM-21 is attractively styled in a rugged all-steel cabinet

with a handy carrying handle. With its compact shape and light weight, it's ideal for taking with you anywhere your service work calls you. Inside you'll find the highest quality components which have been chosen to give you years of reliable, trouble-free service, excellent stability, and precision accuracy. And you'll like the way the chassis is laid out . . . clean, open, easy-to-get-at when assembling.

**SAVE EITHER WAY . . . KIT OR FACTORY ASSEMBLED!** The IM-21 is available in ready-to-use assembled form, or as an easy-to-build kit for extra savings. Regardless of which version you choose, you still enjoy big savings over comparable models. Choose your IM-21 now!

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 cps; write for prices.

**IM-21 SPECIFICATIONS**—Frequency response:  $\pm 1$  db 10 cps to 500 kc,  $\pm 2$  db 10 cps to 1 mc, 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 uuf on ranges 10 to 300 volts, 10 megohms shunted by 22 uuf on ranges .01 to 3 volts. **Tube complement:** (1) 6AW8, (1) 6EJ7/EF-184. **Accuracy:** Within 5% of full scale. **Power requirements:** 105-125 volts, AC, 50-60 cycles, 10 watts. **Dimensions:** 7 $\frac{3}{8}$ " H x 4-11/16" W x 4 $\frac{1}{8}$ " D.

## Heathkit VOM . . . Dependable Components, Accurate 20,000 Ohm/Volt Circuit

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

**COVERS HUNDREDS OF SERVICE APPLICATIONS IN OR AWAY FROM SHOP OR LAB!** If your service work takes you in and out of your shop, you'll find this compact MM-1 an ideal companion. Provides wide voltage, current, resistance and db ranges to cover practically any service requirement. Completely self-contained, the MM-1 uses easy-to-replace standard flashlight battery power . . . ideal for "on-the-spot" field checks and testing permanently installed or "awkward-to-move" equipment!

**1% PRECISION RESISTORS ASSURE MAXIMUM ACCURACY!** 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 will produce a meter deflection of 2 $\frac{1}{4}$ "! A polarity reversing switch eliminates transferring test leads when alternately measuring

positive and negative voltages, and the test jacks are recessed to minimize shock hazard. The meter comes preassembled to the panel to keep out dust and protect internal components.

**SIMPLE MONEY-SAVING ASSEMBLY!** The Heathkit VOM is easy to build . . . all components attach directly to the front panel. The batteries snap in or out in a matter of seconds . . . and the resistor "rings" eliminate excessive handling of switch contacts during construction and provide rugged mountings for precision components. Black bakelite case with soft, pliable plastic carrying handle. Complete with test leads, batteries not included.

Be ready to handle that next "out-shop" call with a Heathkit VOM! Order yours now!

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".



MM-1  
**\$29<sup>95</sup>**

# At Savings Up To 50%!



## Heathkit Deluxe Transistor Tester . . .

### Performs Laboratory-Level Transistor Analysis



IM-30  
\$54.88

- 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 level 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.



**DESIGNED FOR COMPLETE, THOROUGH TESTING.** Superbly engineered circuitry and many unique design features are combined in the Deluxe Heathkit IM-30 to bring you precision lab-type facilities at unheard-of savings! Complete and thorough tests of all transistor types can be made with high accuracy in addition to precise checks of diode characteristics. Ideal for use in servicing and industry where fast, easy testing, high accuracy and versatility are prime factors to be considered.

**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 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.

**WIDE RANGE OF TESTS AVAILABLE.** Tests provided by the Heathkit IM-30 include: Base current, Gain, Collector current, Collector voltage, Leak voltage, Short test, Diode or Collector-to-Emitter leakage (Iceo), and Collector-to-Base leakage (Icbo).

**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

**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.

## Heathkit Transistor/Diode Checker . . .

### A "Must" For The Up-To-Date Service Technician

- 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

**A HANDY UNIT FOR ANY TEST BENCH.** 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.

**VERSATILE OPERATION.** The Heathkit IT-10 checks transistors and diodes, and serves as a handy continuity tester. Tests for low and high-power transistors include: short, leakage, open element and current gain. Versatile switching accommodates PNP or NPN type transistors and eliminates transferring of test leads for diode testing. Removable test leads are provided for checking transistors which do not fit tester socket. Put this handy handful to work for you now . . . Only \$6.95! Less batteries.

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 1/8" H x 3 1/8" W x 3 3/4" D.



IT-10  
\$6.95

# Engineered For Quality... Priced

TEST INSTRUMENTS



Kit Form  
or  
Factory  
Assembled

Kit  
\$29<sup>95</sup>

Wired  
\$49<sup>95</sup>

### Easy To Assemble

Vertical chassis design provides easy access to all components, simplifies assembly. Complete instructions included.



IT-12  
\$19<sup>95</sup>



## Heathkit Deluxe 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 uuf to 1,000 mfd • Comparator circuit—measures "L", "C", or "R" with external standard • Calibrated power factor control • "Eye" tube null & leakage indicator

**ELIMINATES DOUBT & GUESSWORK IN SERVICING AND DESIGN WORK.** Unknown or suspected capacitors and resistors encountered in daily servicing and design work can be tested quickly and efficiently with this superbly designed instrument. Many advanced-design features have been incorporated to assure high accuracy and "safe" testing of all capacitor types . . . even miniature electrolytics that are easily damaged through ordinary testing procedures.

**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 uuf to 1,000 mfd 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 condensers 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  
Assembled ITW-11, 9 lbs. . . No money down, \$5 mo. . . . . \$49.95  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

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

## Heathkit Visual-Aural Signal Tracer . . . Ideal Trouble-Shooter For Solid-State AM Circuits

- Traces RF, IF and audio signals • Locates noisy and intermittent components • Convenient audio-RF probe with switch • Doubles as a utility amplifier or test speaker
- Ideal for "safe" testing of transistor circuits

**QUICKLY ISOLATES DEFECTIVE STAGE IN DEVICE UNDER TEST.** The Heathkit IT-12 Signal Tracer provides a fast, effective means of tracing signals through RF, IF and audio stages to quickly isolate a defective stage. Signals are traced "visually" with the "electron-eye" tube indicator or audibly with the built-in speaker. Audio and RF inputs are handled by one convenient probe with switch-selection of either input.

**PROVIDES SAFE TESTING OF TRANSISTOR EQUIPMENT.** Sensitive transistor circuits, easily damaged through ordinary testing procedures, can be tested safely, since no voltage is applied to the circuit under test. Minute signals are amplified by the IT-12 through a high-gain amplifier with an adjustable level control.

**DOUBLES AS A UTILITY AMPLIFIER OR TEST SPEAKER.** Highly versatile, the IT-12 is ideal for use in checking record changers, tuners, microphones, musical instrument pickups, etc. Speaker and output transformer are also available for substitution tests. A unique noise-locator circuit helps pinpoint noisy and intermittent components. The many features and uses of the IT-12 at low-cost 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 cps; write for prices.

**IT-12 SPECIFICATIONS**—Power supply: Transformer operated. Power requirements: 117 volts 50/60 cycles 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 Short Work Of Capacitor Checks!

- Spots open, shorted or intermittent capacitors without removing from 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 mmf up, not shunted by an excessively low resistance value and "shorted" capacitors up to 20 mfd, 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 cps signal for "short" test, and a 19 mc 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 cps; write for prices.

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



IT-22  
\$10<sup>95</sup>

# For Savings... Heathkit® Test Gear



A NATIONWIDE FAVORITE! The many fine features incorporated in the Heathkit IG-52 at low cost have made this instrument a favorite among TV technicians nationwide! Used with an oscilloscope, such as the Heathkit IO-12, the IG-52 provides all the essential facilities you need for fast, easy alignment of FM and VHF TV receivers.

**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 fundamentals (3.6 to 220 mc) 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 mc (depending upon center frequency).

**HIGH RF OUTPUT.** Well over .1 volt RF output is available to allow "cold" alignment of tuned circuits, filters, traps, etc. Fixed-step and variable attenuators give smooth control of RF output to allow alignment of high-gain stages without danger of overloading.

**CRYSTAL AND VARIABLE MARKER OSCILLATORS ARE BUILT-IN.** A 4.5 mc crystal (included with kit) provides an output at 4.5 mc 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 cps; write for prices.

**IG-52 SPECIFICATIONS—Output impedance:** 50 ohms terminated at both ends of cable. **Sweep deviation:** Continuously variable from 0-4 mc lowest max. deviation to 0-42 mc highest max. deviation (depending on base frequency). **Crystal marker:** 4.5 mc and multiples thereof. **Variable marker:** 19 mc to 60 mc on fundamentals, 57 mc to 180 mc 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 cycles, 50 watts. **Dimensions:** 13" W x 8 1/2" H x 7" D.

## Heathkit TV Sweep Alignment Generator

... All Essential Facilities For FM & TV

Alignment ... A Record Of Service

Proves Its Dependability

- Stable, all-electronic sweep circuit • FM & TV coverage—3.6 to 220 mc • Built-in crystal and variable marker oscillators

IG-52  
**\$67<sup>95</sup>**



**YOUR BEST BUY IN A COLOR TV SERVICE INSTRUMENT!** No other service instrument on the market today offers such an array of features, performance, and quality at so low a price! The Heathkit IG-62 provides all the patterns necessary for color, convergence, linearity and other picture adjustments on both color and black & white TV sets.

**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 at 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.

**ORDER YOURS TODAY!** The many fine features of this superbly designed instrument offer performance and versatility that will be appreciated for years to come. Complete with crystals, test leads and comprehensive operational instructions.

Kit IG-62, 13 lbs... No money down, \$7 mo. .... \$64.95  
Export model available for 115/230 VAC, 50-60 cps; 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 mc 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 cycles, 70 watts. **Dimensions:** 13" W x 8 1/2" H x 7" D.

## Heathkit Color Bar & Dot Generator ...

Unmatched In The Industry For

Performance And Price

- Ideal for color or B&W TV servicing • Produces six different patterns for picture adjustment • 10 vertical color bars—special shading bar pattern • Crystal-controlled for accuracy & stability

IG-62  
**\$64<sup>95</sup>**



# Precision Signal Generators For



IG-112  
**\$99.00**

## Heathkit FM Stereo Generator . . . Provides All Signals For FM Stereo Alignment

- 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 kc ( $\pm 2$  cps) pilot signal, adjustable in level from 0 to 10% for check of tuner lock-in range • Switch selection of 400 cps, 1000 cps, 5000 cps, 19 kc, 38 kc & 65 kc or 67 kc SCA signals for complete alignment capability • 100 mc sweep signal (adjustable  $\pm 2$  mc) for overall RF & IF alignment on clear portion of FM band
- Built-in 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

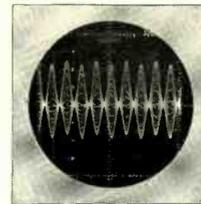
**A COMPLETE FM SERVICE CENTER!** Here in a completely self-contained, easy-to-use instrument are provided all the signal facilities you need for fast, easy alignment and trouble-shooting of all stereo and mono FM tuners, receivers, and multiplex stereo adapters.

**AN EXCITING ARRAY OF FEATURES.** Signals produced by the Heathkit IG-112 include an audio or composite stereo signal for multiplex

adapter adjustments . . . an RF carrier modulated by these same signals for tuner and receiver adjustments . . . a "phase test" function for accurate adjustment of sub-carrier transformers . . . a variable level crystal-controlled 19 kc ( $\pm 2$  cps) pilot signal to check the lock-in range of stereo receivers, and built-in sweep and marker signals for overall RF & IF alignment. Carrier signal is adjustable up to 2 megacycles above or below its nominal frequency to permit alignment on a clear portion of the FM band.

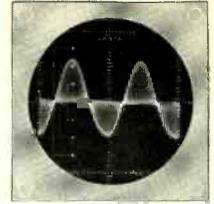
**MANY EXTRAS FOR VERSATILE OPERATION.** Instant selection is made for either right or left channel signals and the special "phase test" on the front panel with no balancing required for equal right and left channel modulation level. Switch selected frequencies for either direct or RF modulation use include 400 cps, 1000 cps, 5000 cps, 19 kc, 38 kc, and two special SCA (subscription service) frequencies (65 kc or 67 kc), 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.



### 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.



### 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 is required to align the generator for accurate results.

**EASY TO BUILD.** Average assembly time is 14 hours. Clean, open circuit layout provides easy access to all components for ease of assembly. Complete with test leads and detailed stereo alignment instructions. Order your Heathkit FM Stereo Generator now for faster, easier servicing and extra profits in this vastly growing field!

Kit IG-112, 11 lbs. . . . .  
No money dn., \$10 mo. . . . . **\$99.00**

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

**IG-112 SPECIFICATIONS**—RF Signal Frequency: 100 mc adjustable by approx.  $\pm 2$  mc. Pilot modulating frequency: 19 kc  $\pm 2$  cps. FM Modulation: Left channel (stereo), right channel (stereo), Phase test (left plus right channel in phase), Monophonic FM. Deviation: Adjustable to 75 kc. Sweep rate: (used for RF and IF alignment) 60 cps. Sweep width: (used for RF and IF alignment) Adjustable to 750 kc. RF Attenuator range: 60 db in 20 db steps. Crystal-controlled markers: 10.7, 90.95, 96.30, 101.65, & 107 mc. Composite signal output: Left channel (stereo); Right channel (stereo). Phase test (left plus right channels in phase). Audio output: 400, 1000, & 5000 cps; 19 kc ( $\pm 2$  cps); 38 kc, & SCA (65 or 67 kc). Distortion: (At 400, 1000 & 5000 cps) Less than 5%. Front panel controls: 19 kc pilot level control, deviation-sweep width-composite level-audio level control, function switch, frequency switch, & RF attenuator switches. Rear panel adjustments: Balance adjust, 38 kc sync, pilot level adjust, & SCA frequency switch. Chassis adjustments: Oscillator adjust, frequency adjust & modulation adjust. Tube complement: 12AT7—19 kc oscillator & 19 kc doubler; 6AU8—19 kc buffer & 38 kc amplifier; 6AN8—Reactance tube modulator & 100 mc oscillator; (3) 12AU7—Audio osc., audio cathode follower & 19 kc pilot amplifier; composite/audio amplifier & 5.35 mc crystal set. Power requirements: 105-125 volts AC, 50/60 cps, 35 watts. Dimensions: 10 1/4" H x 8" D x 13 1/2" W.



IB-2A  
**\$69.95**

- Four popular bridges in one compact instrument • Slanted control panel for easy reading & operation • Built-in generator & detector amplifier • Battery-type tubes—no warmup required • 1/2% precision resistors & silver-mica capacitors

## Heathkit Impedance Bridge Kit

**VERSATILE TESTING FACILITIES WITH LAB ACCURACY.** Four precision measuring bridge circuits, a Wheatstone bridge for resistance, a Capacity Comparison bridge for capacitance, a Maxwell bridge for low Q inductance, and a Hay bridge for high Q inductance, are combined in this compact, easy-to-use instrument. **DESIGNED FOR RAPID, ACCURATE TESTING.** Clearly identified panel controls show units, fractions of units, and multipliers. Single function switch eliminates confusion.

**BATTERY-TYPE TUBES.** Minimize changes in operating characteristics due to thermal effects . . . ready to go at a flick of the switch. . . .

**EASY-ON-THE-BUDGET PRICE!** The low cost of the IB-2A puts lab testing facilities within

easy reach of the service technician, radio amateur, or home experimenter.

Kit IB-24, 11 lbs. No money dn., \$7 mo. **\$69.95**  
Export model available for 115/230 VAC, 50-60 cps; 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 cycle generator. Terminals on panel for external generator at other frequencies. Detector: Vacuum tube detector and amplifier, using built-in meter. Terminals provided for external detector. Resistance: 0.1 ohm to 10 megohm. Capacitance: 100 mmf to 100 mfd. 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 selenium rectifier. Power requirements: 105-125 V, 50/60 cycles AC, 10 watts. Dimensions: 8" H x 17" W x 6" D.

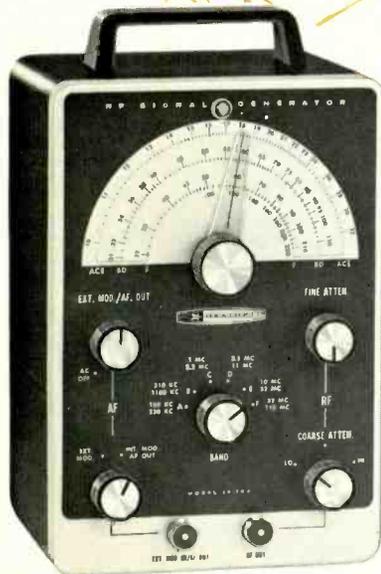
# The Service Bench & Laboratory



## Heathkit RF Signal Generator . . . Fulfills Virtually All Laboratory And Service Requirements

- Covers 100 kc to 220 mc in six bands
- Large, accurately calibrated dial scales
- Prewired, pre-aligned coil/bandswitch assembly
- Modulated or unmodulated RF output
- 400 cps signal for audio tests

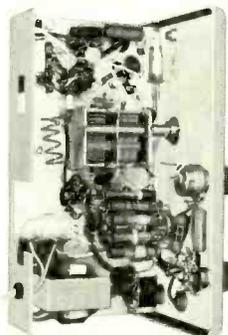
A VALUABLE ADDITION TO ANY TEST BENCH! This popular low-cost Heathkit RF signal generator provides wide frequency coverage, excellent accuracy and high reliability for countless applications in radio and TV service work. Quality and performance is unmatched at this low price.



Kit Form or  
Factory Assembled

Kit **\$27<sup>95</sup>**      Wired **\$54<sup>95</sup>**

**FACTORY ALIGNED COILS**  
Preassembled coil and band switch assembly, aligned to factory precision standards, assures accurate calibration of your completed instrument.



**OUTSTANDING 2% CALIBRATION ACCURACY!** Carefully designed circuitry and accurately calibrated dial scales permit precise frequency settings on all bands. Frequency coverage provides 100 kc to 110 mc on fundamentals . . . 100 mc to 220 mc on calibrated harmonics in six overlapping bands. Frequency is read on three large, easy-to-read dial scales.

**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 cps, and provision is made for external modulation at other frequencies. The 400 cps signal with 10 volt output is available separately for audio tests.

**EASY TO BUY . . . EASY TO BUILD . . . EASY TO USE!** Order one for your test bench now for faster, easier servicing and alignment!

Kit IG-102, 6 lbs. No money dn., \$5 mo. **\$27.95**  
Assembled IGW-102, 6 lbs.,

No money dn., \$6 mo. . . . . **\$54.95**  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**IG-102 SPECIFICATIONS**—Frequency range: Band A, 100 kc to 320 kc; Band B, 310 kc to 1.1 mc; Band C, 1 mc to 3.2 mc; Band D, 3.1 mc to 11 mc; Band E, 10 mc to 32 mc; Band F, 32 mc to 110 mc. **Calibrated harmonics:** 100 mc to 220 mc. **Accuracy:** 2%. **Output:** Impedance, 50 ohms; Voltage, 100,000 uv. **Modulation:** Internal, 400 cps, 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 cycles AC, 15 watts. **Dimensions:** 6½" W x 9½" H x 5" D.

## Heathkit Switch-Selected Audio Generator . . . When A Near-Perfect Sine Wave Is Required

- Switch-selected output frequencies—10 cps to 100 kc
- Less than 0.1 of 1% distortion—20 to 20,000 cps
- Panel metered output is calibrated in volts & db
- Output level and frequency accurate to within ±5%

AN IDEAL AUDIO SERVICE INSTRUMENT. Thanks to the unique circuitry of this superbly designed instrument you can forget about input variations and distortion when working with audio equipment. The Heathkit IG-72 provides convenient switch-selection of the audio frequency with less than 0.1 of 1% distortion between 20 & 20,000 cps for outstanding results in every application.

**SWITCH-SELECTED AUDIO FREQUENCIES.** Three rotary switches select two significant figures and a multiplier to determine frequency. Frequency can be varied in one-cycle steps from 10 to 100 cps, and a four-position multiplier increases this range in multiples of 10 for an overall range of 10 cps to 100 kc. Accuracy is well within ±5% and resetability is excellent . . . ideal for testing different components under identical conditions.



**PRECISION COMPONENTS**  
200 ua meter plus precision resistors in "cycle" switches contribute to the high accuracy of the completed instrument.

Kit Form or  
Factory Assembled

Kit **\$41<sup>95</sup>**      Wired **\$64<sup>95</sup>**

**METERED OUTPUT VOLTAGE.** Generator output is indicated on a large 4½" 200 ua meter calibrated in volts and decibels for exact settings to test conditions. Output attenuator operates in steps of 10 db and is calibrated in 8 full-scale meter ranges. A variable output attenuator provides "fine" adjustment on each range, and a slide-switch selects either built-in or external 600 ohm load. Order one of these fine units for your test bench now.



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 cps; write for prices.

**IG-72 SPECIFICATIONS**—Frequency: 10 cps to 100 kc, 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 cps. **Tubes:** (1) 6AU6, (1) 6CL6, (1) 6X4. **Power:** 105-125 volts AC, 50/60 cycles, 40 watts. **Dimensions:** 9½" W x 6½" H x 5" D.

# How to Order

## Three Ways To Order From The World's Largest Selection Of Electronic Kits

**I. BY MAIL:** Make your selections from the full line of Heathkits and accessory items offered in this catalog. You'll find the descriptions and detailed specifications a great help in deciding which Heathkits best suit your needs. To Order: Fill out the Heath order blank—including the reverse side if you wish to use our liberal Time Payment Plan. Enclose your check or money order to cover the type of payment plan you've chosen, plus shipping charges if required.

**II. BY TELEPHONE:** Days (8 a.m.—4:30 p.m. EST) Call area 616, 983-3961 for personal service. Nights (4:30 p.m.—8 a.m. EST) Call area 616, 983-3921 for our Electronic Secretary. However, if the Electronic Secretary does not hear your instructions within twelve seconds the line will be disconnected... so be prompt, yet speak slowly, clearly, and at an above-average level. *Helpful Tips.* You can call Heath after 8 p.m. from anywhere in the U. S. for \$1.00 or less. When calling at night, spell out your name, street address and city, and any unusual words; give the kit model number and price; indicate your preference for shipping method (parcel post, express, motor freight); and give your phone number. All phone orders are shipped C.O.D.

**III. DIRECT FROM THE FACTORY:** Visit our factory showroom at Benton Harbor... examine an assembled model of the Heathkit you've chosen... then take your kit home with you or arrange for shipment through direct factory-to-you sales.

### Especially For New Customers—To Order By Mail...

The numbered instructions below are keyed to the numbers on the order blank opposite. They'll make it easy to fill out your first order correctly.

We can fill and ship your order quickly and accurately when the information you give us is complete and clearly written.

**1 Print Name In Full.** Always use the same name when ordering; for example, do not use Robert E. Jones one time and R. E. Jones another. This keeps your name on our mailing list for new catalogs—and your order will be handled faster.

**Print Your Complete Address.** Give all information: street address, route, box no., post office, state, and zip code.

**2 To Ship To Another Address.** Be sure to give complete information.

**3 Select The Shipping Method** you want us to use and mark the appropriate square. The Shipping Information page includes rates and other details. This, with your own knowledge of delivery conditions in your community, will help you make the best selection.

**If You Have Selected REA Express,** be sure to fill in the town and state if your express delivery point is different from your own address.

**NOTE:** We will change routings to the cheapest way if a delay condition forces us to ship more than once to complete your order.

**4 If You Have Moved Since Your Last Order,** fill in your former address in this space.

**5 To Help Us In Our Development Of New Heathkits** you would like to see, please fill in this portion.

**6 We Can Handle Your Order Most Promptly** if we know whether this is your first order. Please check the correct square.

**7 Fill In Part 7** using the product descriptions for reference. Include total price. Use a separate line for each different model ordered.

**8 Check The Appropriate Square For Whichever Way You Wish To Buy.** Cash orders should include full remittance to cover merchandise, sales tax, and postage if you wish us to ship by Parcel Post. (A check or money order is preferred. If you must send currency, please use Registered Mail. Do not send stamps.)

Include a 20% deposit if you wish us to ship C.O.D.

Although not required on Time Pay orders up to \$300, a down payment will reduce your monthly payment and carrying charge. Please refer to the reverse side of the order blank for Time Pay details.

*If this order is to be added to a current Time Payment account, be sure to show your present account number as it appears in your payment book. For fast handling, enclose your payment book and any payment you wish to make with your order. Do not make any further payments until we have sent you a new payment book.*

**9 If You Used A Different Catalog Or Advertisement** to make your selection for this order, show the number of that catalog or ad in this space.

**10 Sum Up Your Order As Described Below:**

**A.** When a discount is offered, such as 5% for a stereo/hi-fi system, write the amount in the first space in this column.

**B.** Add the totals for the kits ordered, deduct any allowance, and fill in the remaining total amount for the merchandise ordered.

**C.** Fill in the amount of Michigan Sales Tax if the order is to be delivered in Michigan.

**D.** Fill in the amount for parcel post. Do not remit money for REA express, or Motor Freight as charges are collected by the carrier at the time of delivery.

**E.** If you are remitting a balance due from a previous order, fill in original invoice number and enter amount.

**F.** Enter the sum of the amounts from the spaces above.

**G.** If you are remitting for a Time Pay down payment, or a 20% deposit for a C.O.D. order, check the proper square and enter the amount in this space.

**H.** If you are remitting for a 20% C.O.D. deposit, enter the amount in this space.

**I.** Enter the Total Amount from F, less any down payment or deposit from G, or H.

Note additional Time Pay instructions on reverse side of Order Blank.

Be especially sure to sign the Time Pay Agreement.

Before you mail your order, please look over the order blank. Make sure it is complete and that all the figures are correct. Check to be certain that your money order or check is for the correct amount—total amount on cash orders; down payment amount on Time Pay orders; or 20% deposit on C.O.D. orders.

**Important:** If you have any reason to write us, please write your correspondence on a separate paper rather than on the order blank.

## Open Your Heath Time-Pay Account & Enjoy No Money Down On Orders Up to \$300.00... Easy Monthly Payments

If your order is \$300 or more, only 10% down opens your Heath Time-Pay Account. What's more, once your Heath account is established and you have made at least three payments, you can "add-on" purchases of \$25.00 or more. To Make "Add-On" Purchases... merely fill out the order blank as usual, being sure to show your present account number; check the "add-on" box; sign the Time Payment Agreement; then send your order and payment book to us. Make no further payments until your new payment book is sent to you. The chart below will assist you in "adding-on" and planning your Heath Time-Pay Account.

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

## Heath Accounts For Government, Business And Educational Institutions

We offer 30 day terms to governmental agencies and established commercial firms.

For firms who have not purchased from us, either an acceptable Dun and Bradstreet rating or names and addresses of five firms with whom you are presently doing business are required.

Please submit your purchase order rather than the Heath order blank.

We also offer 30 day terms to educational institutions. Write for special quotations.

## Heathkit Overseas

Many Heathkits are available in special export versions. Look for the "Export model available" note at the bottom of the price lines. Heathkits can be shipped direct from the Heath factory to most overseas countries, in addition to those with Heathkit affiliated companies. For details on international orders and shipments, write to Mr. Joseph Solari, International Division, Heath Company, Benton Harbor, Michigan 49023.

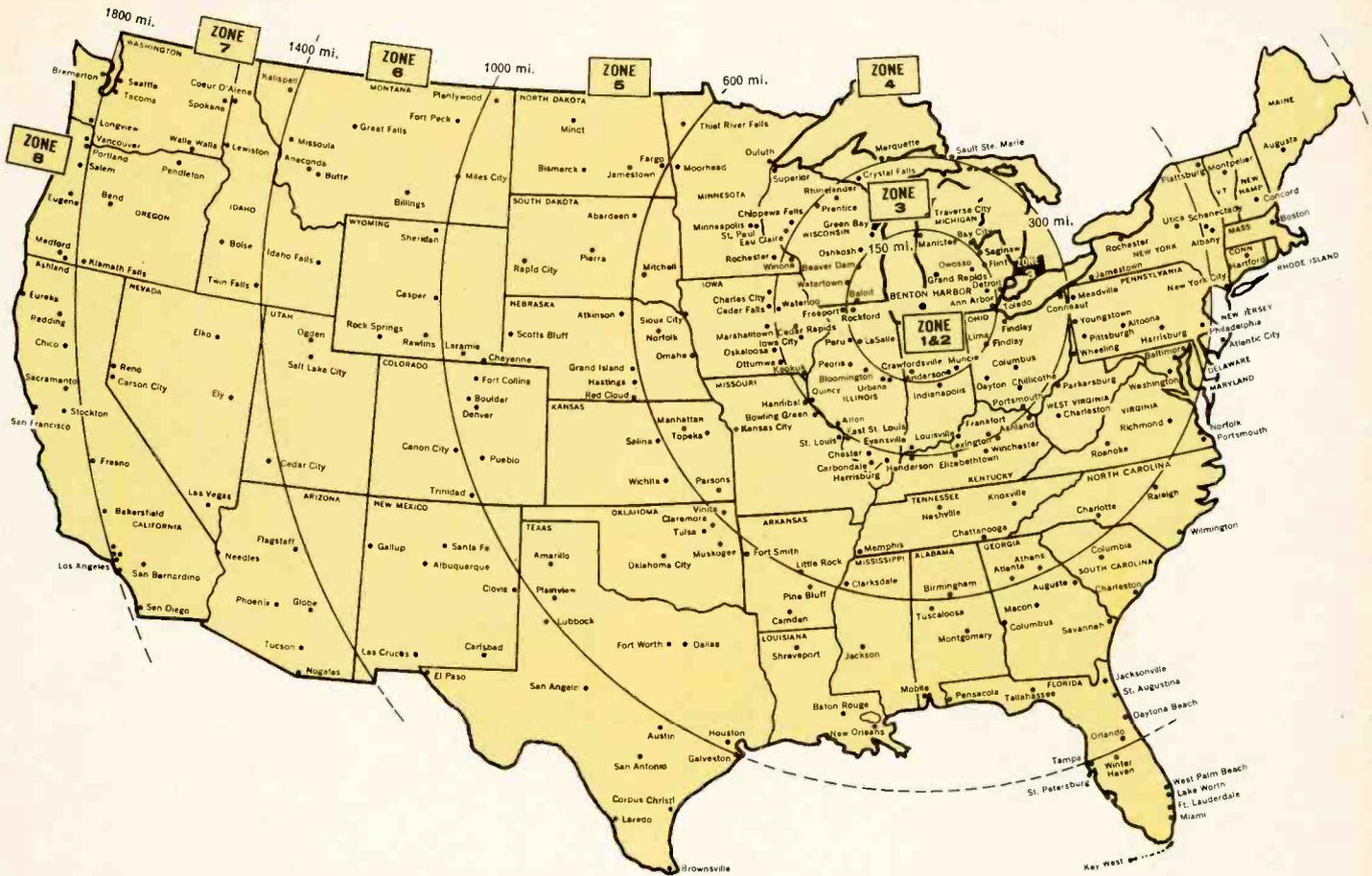
**Attention:** Heathkit Fans In Puerto Rico And Other U.S. Possessions! A special time payment plan is available. Write us for details.

## So We May Serve You Best

When you are moving, please send us your former name and address as we have it now, and your new address, including all information: Street Address, Route, Box Number, Post Office, State, and Zip Code. This will keep catalogs, correspondence and your shipments coming without interruption.

# How To Figure Shipping Costs

The Map And Tables Below Will Help You Choose The Best Way For Shipping Your New Heathkits



Find Parcel Post Zone On Map . . . Then Refer To Rate Table Below

## Parcel Post Rates

### Weight Limitations

Shipments are limited to 20 pounds to zones 3 to 8 and to 40 pounds to zones 1 and 2. Exception: Shipments up to 70 pounds can be made to RFD and most APO and FPO addresses.

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 \$5.00	40 cents
\$5.01 to \$10.00	50 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.

### PARCEL POST RATE TABLE

Weight 1 Pound and Not Exceeding	1 & 2 Up to 150 Miles	3 to 150 Miles	4 to 300 Miles	5 to 600 Miles	6 to 1,000 Miles	7 to 1,400 Miles	8 Over 1,800 Miles
2	\$0.33	\$0.35	\$0.39	\$0.45	\$0.51	\$0.58	\$0.64
3	.38	.41	.47	.55	.64	.74	.83
4	.43	.47	.55	.65	.77	.90	1.02
5	.48	.53	.63	.75	.90	1.06	1.21
6	.53	.59	.70	.85	1.03	1.22	1.40
7	.58	.65	.77	.95	1.16	1.38	1.59
8	.63	.71	.84	1.05	1.29	1.54	1.78
9	.68	.77	.91	1.15	1.42	1.70	1.97
10	.73	.83	.98	1.25	1.55	1.86	2.16
11	.77	.89	1.05	1.35	1.67	2.02	2.34
12	.81	.95	1.12	1.45	1.79	2.18	2.52
13	.85	1.01	1.19	1.55	1.91	2.34	2.70
14	.89	1.07	1.26	1.65	2.03	2.50	2.88
15	.93	1.13	1.33	1.75	2.15	2.66	3.06
16	.97	1.18	1.40	1.85	2.27	2.81	3.24
17	1.01	1.23	1.47	1.95	2.39	2.96	3.42
18	1.05	1.28	1.54	2.05	2.51	3.11	3.60
19	1.09	1.33	1.61	2.15	2.63	3.26	3.78
20	1.13	1.38	1.68	2.25	2.75	3.41	3.96
21	1.17	1.43	1.75	2.34	2.87	3.56	4.14
22	1.21	1.48	1.82	2.43	2.99	3.71	4.32
23	1.25	1.53	1.89	2.52	3.11	3.86	4.50
24	1.29	1.58	1.96	2.61	3.23	4.01	4.68

Weight 1 Pound and Not Exceeding	1 & 2 Up to 150 Miles	3 to 150 Miles	4 to 300 Miles	5 to 600 Miles	6 to 1,000 Miles	7 to 1,400 Miles	8 Over 1,800 Miles
25	\$1.33	\$1.63	\$2.03	\$2.70	\$3.35	\$4.16	\$4.86
26	1.37	1.68	2.10	2.79	3.47	4.31	5.04
27	1.41	1.73	2.17	2.88	3.59	4.46	5.22
28	1.45	1.78	2.24	2.97	3.71	4.61	5.40
29	1.49	1.83	2.31	3.06	3.83	4.76	5.58
30	1.53	1.88	2.38	3.15	3.95	4.91	5.76
31	1.57	1.93	2.45	3.24	4.06	5.05	5.93
32	1.61	1.98	2.52	3.33	4.17	5.19	6.10
33	1.65	2.03	2.59	3.42	4.28	5.33	6.27
34	1.69	2.08	2.66	3.51	4.39	5.47	6.44
35	1.73	2.13	2.73	3.60	4.50	5.61	6.61
36	1.77	2.18	2.80	3.69	4.61	5.75	6.78
37	1.81	2.23	2.87	3.78	4.72	5.89	6.95
38	1.85	2.28	2.94	3.87	4.83	6.03	7.12
39	1.89	2.33	3.01	3.96	4.94	6.17	7.29
40	1.93	2.38	3.08	4.05	5.05	6.31	7.46
45	2.13	2.63	3.43	4.50	5.60	7.01	8.26
50	2.33	2.88	3.78	4.95	6.15	7.71	9.06
55	2.53	3.13	4.08	5.35	6.70	8.36	9.86
60	2.73	3.38	4.38	5.75	7.25	9.01	10.66
65	2.93	3.63	4.68	6.15	7.80	9.66	11.46
70	3.13	3.88	4.98	6.55	8.35	10.31	12.26

IMPORTANT: Parcel Post rate changes enacted April, 1964 are reflected in this table.

### 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.

Charges For 100 Lbs. Or Less	Up to 150 Miles	150 to 300 Miles	300 to 600 Miles	600 to 1,000 Miles	1,000 to 1,400 Miles	1,400 to 1,800 Miles	Over 1,800 Miles
Type of Merchandise:							
Instruments	\$4.91	5.18	6.23	6.70	7.77	8.80	9.87
TV's, Organs, Receivers, Transmitters, Amplifiers, Record Players	\$4.91	5.18	6.23	6.70	8.18	9.36	9.36
Cabinets	\$4.91	5.18	6.53	7.59	9.77	10.79	10.79

### 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.

Ship. Wt.	Up to 150 Miles	150 to 300 Miles	300 to 600 Miles	600 to 1,000 Miles	1,000 to 1,400 Miles	1,400 to 1,800 Miles	Over 1,800 Miles
5 lbs.	\$3.73	3.73	3.73	3.77	3.80	3.93	4.00
10 lbs.	3.93	4.00	4.13	4.28	4.48	4.80	5.05
20 to 75 lbs.	4.52	4.44	5.14	—	—	—	—
30 to 75 lbs.	—	—	—	6.08	7.50	8.42	8.80
100 lbs.	4.52	4.46	5.17	6.12	7.54	8.47	8.85

# Save Up To 50% on Your Instruments

## Heathkit Sine-Square Wave Generator A General Purpose Instrument That Produces Research-Quality Sine & Square Wave Signals

- Covers 20 cps to 1 mc 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

**USEFUL IN AUDIO, TV, HIGH-FIDELITY AND GENERAL LAB TESTING!** Because of its ability to produce a wide range sine and square wave signals, the compact IG-82 can be used for virtually any application in any of these testing areas. There's plenty of quality performance and versatility, too. Both sine and square wave outputs may be used separately or simultaneously . . . *without* affecting either waveform. And 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, p. 70, 14 lbs. . . . No money down, \$10 mo. . . . \$94.00  
 Export model available for 115/230 VAC, 50-60 cps; write for prices.

**IG-82 SPECIFICATIONS—SINE WAVE:** Frequency range: 20 cycles to 1 mc. 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 cycles. Frequency response:  $\pm 1.5$  db 20 cycles to 1 megacycle. **SQUARE WAVE:** Frequency range: 20 cycles to 1 mc. 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 cycles, 55 watts. Dimensions: 13" W. x 8 1/2" H. x 7" D.



Kit Form or  
Factory Assembled

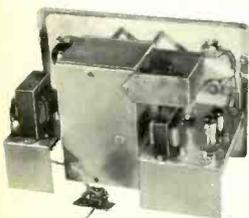
IG-82  
**\$51<sup>95</sup>**



**EXTRA-VALUE DESIGN** means better performance. Shielded tuning condenser and frequency multiplier switch—conservatively rated power transformer—silicon diode rectifiers—simplicity of circuitry—all contribute to high quality waveforms.



IG-42  
**\$56<sup>95</sup>**



**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.

## Heathkit Laboratory RF Generator Provides Precision-Attenuated RF Signals

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

**SPECIALLY DESIGNED FOR PROFESSIONAL SERVICE SHOP OR LABORATORY!** That's the Heathkit IG-42 Laboratory RF Generator . . . an invaluable instrument for design and development work. Covers a frequency range of 100 kc to 30 mc . . . all on fundamentals in five easy-to-read bands. The accurately calibrated 200 microampere panel meter indicates output in microvolts or percent modulation as selected by a panel switch.

**100,000 MICROVOLT MAXIMUM METERED OUTPUT!** And it is controlled by both fixed step and continuously variable output attenuators. Modulation is variable from 0 to 50% at 400 cycles internally or externally between 60 cps and 10,000 cps.

**FEATURES EXTENSIVE SHIELDING!** The compartmentalized chassis is copper-plate shielded, and with the line cord filter, isolates critical stages and prevents spurious RF radiation. The well-designed power supply is transformer operated for safety and high efficiency . . . features generous filter design and voltage regulation for smooth stable plate voltage. The generator output impedance is 50 ohms. The terminating resistor, located in a plastic pod on the end of the coaxial cable, is easily changed for specific impedances.

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 cps; write for prices.

**IG-42 SPECIFICATIONS—Frequency ranges:** Band A, 100 to 290 kc; Band B, 280 to 1000 kc; Band C, 0.95 to 3.1 mc; Band D, 2.9 to 9.5 mc; Band E, 9 to 31 mc. **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 cycles or external audio frequencies. **Modulation depth:** 0 to 50% variable, indicated on meter. **Tube complement:** 6AF4, 6AV5, 12AU7, 6B2. **Power requirements:** 105-125 V. 50/60 cycles. **Dimensions:** 13" W. x 8 1/2" H. x 7" D.

# For Circuit Analysis



## Heathkit Harmonic Distortion Meter . . . For Accurate Analysis Of Hi-Fi Electronics

- Measures distortion from 20 to 20,000 cps
- Meter scales calibrated in volts RMS, % distortion & db
- Measures noise levels down to -60 dbm
- Quality components for precision measurements
- Easy to operate and assemble

**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 cps. 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. Order yours now!

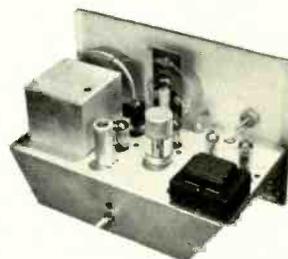
Kit IM-12, 13 lbs. . . No money down, \$6 mo. . . . . \$54.95  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**IM-12 SPECIFICATIONS**—Frequency: 20 cps to 20,000 cps 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: 6X4, 6X4, 5879, 12AT7, 12AX7, 12BY7. Power requirements: 105-125 V. 50/60 cycles AC, 30 watts. Dimensions: 13" W x 8 1/2" H x 7" D.



IM-12

\$54<sup>95</sup>



### Quality Design

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

## Heathkit Audio Analyzer . . .

### 3 Audio Test Instruments In One . . . Performs Complete Intermodulation Checkout

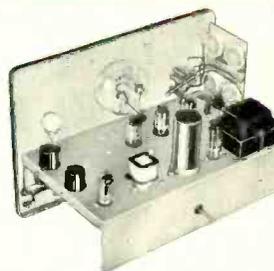
- Considerable savings over 3 separate instruments
- Combines function of AC VTVM, Wattmeter & IM Analyzer
- Built-in high and low frequency sources for IM tests
- Built-in load resistors for 4, 8, 16 and 600 ohms
- Large easy-to-read meter—simplified switching system

**COMPACT, EASY-TO-USE, VERSATILE!** The Heathkit IM-22 audio analyzer provides all the facilities you need for complete and *thorough* IM analysis of stereo high fidelity equipment. Performs all basic functions with only two sets of test leads. A unique built-in switching system allows use of any portion of the instrument separately or combines functions internally for simple operation . . . no clutter of test instruments . . . no more confusing mass of 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 kc and 60 cps 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 cps; write for prices.

**IM-22 SPECIFICATIONS**—Frequency response—AC VTVM: 10 cycles to 100 kc  $\pm 1$  db. Wattmeter: 10 cycles to 50 kc  $\pm 1$  db. I.M. Analyzer high pass filter: 2000 cps to 12,000 cps. I.M. Analyzer low pass filter: 10 cps to 600 cps. 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 cycles; High frequency, approximately 6 kc. 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 cycles 20 watts. Dimensions: 13" W x 8 1/2" H x 7" D.



### 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.



IM-22

\$56<sup>95</sup>



# Heathkit Power Supplies... For

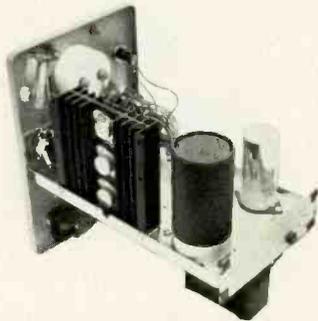


A Heathkit Classic... features reliable, proven, time-tested circuitry. The dual series-regulators operate well within their ratings.



Kit Form or  
Factory Assembled

Kit **\$56<sup>95</sup>**    Wired **\$84<sup>95</sup>**



Large area heat sink assures long component life and stable operation. Spacious component layout provides ample ventilation... easy assembly.

Kit Form or  
Factory Assembled

Kit **\$72<sup>95</sup>**    Wired **\$114<sup>95</sup>**



Kit Form or  
Factory Assembled

Kit **\$47<sup>50</sup>**  
Wired **\$59<sup>95</sup>**



Husky silicon diode rectifiers maintain a minimum of internal voltage drop—a maximum of efficiency and dependability.



## Heathkit Variable-Voltage Regulated Power Supply Provides A Wide Range Of Voltages 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

**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 protection 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 cps; 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  $\pm 10$  v. change at 117 V. AC input. **Ripple:** Less than 10 millivolts RMS, ripple, jitter and noise. **Output impedance:** Less than 10 ohms, DC to 1 mc. **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" Regulated Power Supply Excellent For Testing Or Servicing—Features An Adjustable Current Limiter

• All-transistor solid-state circuitry • Relay protected against short circuit & overload • 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

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 cps; write for prices.

**IP-20 SPECIFICATIONS—Input:** 105-125 volts 60 cps; 125 watts at full load (50V, 1.5A). **Output:** 0.5-50 volts DC; 1.5 amps max. DC. **Load regulation:**  $\pm 15$  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 kc; less than .5 ohms 10 kc & up. **Overload protection:** Current limiter & relay. **Meter:** 3 1/2", 1 ma, 50 ohm. **Current ranges:** 50 ma, 150 ma, 500 ma, 1.5 amp. **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 . . . Low AC Ripple Makes This A Remarkably Versatile Low-Voltage Supply

• Convenient switch-selection of 6 or 12 volt DC power • Special ripple filter circuit holds AC ripple to less than .3%. Panel metered output voltage & current • Doubles as a convenient battery charger • Heavy-duty well-rated components throughout • Dependable silicon diode rectifier circuit provides increased efficiency.

**AN INSTANT SOURCE OF 6 OR 12 VOLT DC POWER!** This modern battery eliminator provides a ready, reliable source of 6 or 12 volt DC power for servicing all types of transistor and hybrid radio equipment . . . no stock of batteries to keep on hand or messy storage batteries to worry about.

**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**  
**Assembled IPW-12, 17 lbs. . . . . No money down, \$6 mo. . . . . \$59.95**  
 Export model available for 115/230 VAC, 50-60 cps; 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 cycles AC at 200 watts. **Dimensions:** 13" W x 8 1/2" H x 7" D.

# Professional & Laboratory Test

## 3-Decade Condenser Kit

This precision laboratory-type capacitance decade provides convenient switch-selected capacitor values from 100 uuf to 0.111 uf in 100 uuf steps. Ideal for use in substitution tests, and many more applications where extremely high accuracy is desired. Shows effects of different capacitance to determine proper value . . . often faster than involved calculations! High quality ceramic wafer switches have positive detent action.

Kit IN-21, 3 lbs. . . . . \$17.95

**IN-21 SPECIFICATIONS**—Range: 100 uuf to 0.111 uf in increments of 100 uuf. Voltage rating: 350 v. DC continuous; 500 v. DC Intermittent; 1000 v. DC instantaneous test. Accuracy of incremental capacity:  $\pm 1\%$ . Stray capacitance: 10 to 15 uuf at terminals. Dimensions: 7 1/2" W x 4" H x 5" D.

## 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 at terminals with all sw. set at zero. Dimensions: 7 1/2" W x 5" H x 6 3/8" D.

## Resistance Substitution Box Kit

Radio and TV service technicians find this kit valuable for restoring proper circuit characteristics when replacing 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

## Condenser Substitution Box Kit

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 uf to 0.22 uf. 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



IN-21  
\$17.95



IN-11  
\$24.95



IN-12  
\$5.95



IN-22  
\$5.50

## Heathkit FM Alignment Generator

FMO-1  
\$34.95

- Variable 10.7 mc sweep, 200 kc to over 1 mc • Switch-selected 90, 100 & 107 mc signals • 100 kc bandwidth markers for checking bandpass

**FAST, EASY FM ALIGNMENT!** Provides all essentials for tuning RF and IF circuits. Sweep center marker is crystal controlled. A 400 cps signal is available to modulate RF for audio checks. Complete with test leads.

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

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



## Heathkit Laboratory "Q" Meter

QM-1  
\$54.95

- Tests components at operating frequency—150 kc to 18 mc
- Measures Q, L, and distributed capacity of coils • Large 4 1/2" 50 ua meter—easy-to-read dial scales • Special test coil furnished for calibration • Oscillator output metered for constant injection

**A PRACTICAL TOOL FOR ENGINEERING AND DESIGN** . . . tests components under actual working conditions. Measures unknown capacitors (fixed & variable), distributed capacity, and "Q" of coils. No involved calculations necessary, since the meter shows "Q" values directly.

Kit QM-1, 13 lbs. . . . . No money down, \$6 mo. . . . . \$54.95  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**QM-1 SPECIFICATIONS**—Frequency: 150 kc to 18 mc in four bands. Inductance: 1 microhenry to 10 millihenrys. "Q": 250 full scale x1 or x2. Capacitance: Actual, 40 uuf to 450 uuf; Effective, 40 uuf to 400 uuf; Vernier  $\pm 3$  uuf. Tubes: (1) 12AT7, (1) 6AL5, (1) 12AU7, (1) 6X5, (1) OD3/VR150. Power requirements: 105-125 volts, 50/60 cycles AC, 30 watts. Dimensions: 8" H x 17" W x 6" D.



# Equipment . . . Up To 50% Savings



## Heathkit Tube Checker . . . Fills All Daily Service Requirements

- Latest design features and professional styling • Tests most all tube types including new Compactron, Nuovistor, 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

With this modern up-to-date tube checker on your test bench you can test tubes encountered in everyday radio and TV servicing. Saves valuable time by eliminating doubt and guesswork as to tube quality before further circuit investigations are made.

**VERSATILE.** 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  
\$44<sup>95</sup>

**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, loctal, 10-pin miniature, 9-pin novar, 12-pin compactron, 5-pin nuovistor, 7-pin nuovistor. **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 cycles. **Dimensions:** 13" W x 8 1/2" H x 5 1/2" D.

## 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, Nuovistor, Novar & 10-pin miniature tube types

Professionals involved in critical service and design work choose the Heathkit TT-1A. It offers sophisticated, thorough tube testing facilities at low acquisition cost.

**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 required. Other service-designed features include an illuminated roll chart with thumbwheel drive knobs on both sides and a 110 volt AC outlet for other equipment. Handsomely styled in a rich, black leatherette portable case the TT-1A is ideal for tests "on" or "away from" the test bench. Order yours today!

Kit TT-1A, 34 lbs. . . No money down, \$14 mo. . . . . \$149.95



TT-1A  
\$149<sup>95</sup>

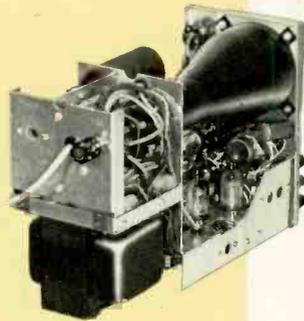
**TT-1A SPECIFICATIONS**—Power requirements: Voltage: 105-125, 60 cycle AC. Watts: 10-60 (dependent upon tube under test). **Plate supply (silicon rectifiers):** DC volts: 26, 90, 135, 225, variable 80 to 200. (Separate DC supply for space charge grids.) **AC volts:** 20, 45, 177. **Bias supply (silicon 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 cycles. **Filament supply:** Voltages: .65, 1.1, 1.5, 2, 2.3, 3.3, 5, 6.3, 7.5, 10, 13, 20, 27.5, 35, 47, 70, 115. Currents: 300, 450, 600 ma. (Note: Filament voltage is reduced 10% during life test.) **Testing circuits:** Gm: mutual conductance for amplifiers, 0-24,000 micromhos. Emission: rectifiers and diodes. Leakage: direct reading ohmmeter. Grid current: 1/4 microampere sensitivity. Voltage regulator: firing voltage and regulation tolerance. Low power thyatron: grid characteristics, conduction capabilities. Eye tubes: control grid characteristics. **Meter:** AC: 1000 ohms/volt (1 volt full scale). DC: .89 ma full scale. Scales: Gm, 0-3000 micromhos. VR test volts, 0-200. Leakage, 0-10 megohms. Diodes, OK. Rectifiers, OK. Line check arrow at midscale. **Tube complement:** (1) 3A4 oscillator and (1) 12AV6 meter control. **Calibration circuit:** Built-in, switch operated. **Socket accommodations:** 4-pin, 5-pin, 6-pin, 7-pin combination and pilot light, 7-pin miniature, 7-pin subminiature, 8-pin submarine, octal, loctal, 9-pin miniature, 10-pin miniature, 5-pin and 7-pin nuovistors, 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.

### 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.

# Unsurpassed Values in Service and

## Heathkit "Space-Saver" 3" DC Oscilloscope For DC, AC, And Low Frequency AC Applications



IO-10  
\$89<sup>95</sup>

- Identical vertical & horizontal DC or AC coupled amplifiers • DC to 200 kc bandwidth—less than 5° phase shift • Recurrent sweep generator, 5 cps to 50 kc in four ranges • External capacitor binding posts for slower sweep rates • Small, compact, easy to carry from job to job

**VERSATILE.** This beautifully designed instrument takes only a fraction of the space occupied 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.

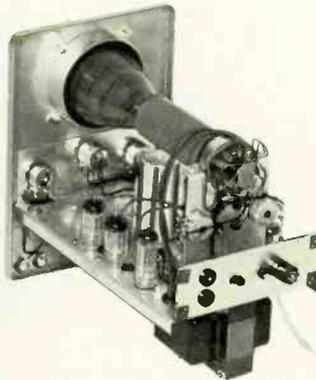
**PROVIDES EXTREMELY LOW SWEEP RATES.** The recurrent sweep generator employed in IO-10 covers 5 cps to 50 kc in four overlapping ranges . . . lower sweep rates may be obtained by connecting additional capacitors across the external binding posts provided. This feature is especially useful in medical 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 assures 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, \$9 mo. . . . . \$89.95  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**IO-10 SPECIFICATIONS—(Vertical and horizontal channels identical):** Bandwidth: DC to 200 kc (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 saw-tooth produced by multivibrator type generator covering 5 cps to 50 kc 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 cycle AC at 100 watts max. Dimensions: 7 3/8" H x 4 3/8" W x 11" D.

## Heathkit "General Purpose" 3" Oscilloscope Compact . . . Lightweight . . . Surprisingly Versatile . . . An Ideal Scope For Home Or Classroom Electronics



IO-21  
\$54<sup>95</sup>

**IO-21 SPECIFICATIONS—(Vertical and horizontal amplifiers identical):** Frequency response: ±2 db, 2 cps, to 200 kc. Sensitivity: .25 volts RMS/inch P-P deflection at 1 kc. Input impedance: 10 megohms shunted by 20 uuf. (Direct connection to vertical CRT plates on rear panel). Sweep generator: Range 20-100,000 cps. 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 cycle, 40 watts. Dimensions: 9 1/2" H x 6 1/2" W x 10" D.

- Push-pull vertical and horizontal amplifiers • Wide-range sweep generator—20 to 100,000 CPS • Automatic sync—retrace blanking • Clean, open circuit layout for easy assembly

**AN AMAZING VALUE!** This handy oscilloscope fills hundreds of the daily requirements in servicing, the home workshop, 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 tubes 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. . . . . \$54.95  
Export model available for 115/230 VAC, 50-60 cps; write for prices.  
See page 65 for comb. offer with EF-2 Applications Course. . . . \$62.95

# Laboratory Oscilloscopes



## Heathkit 5" Wide-Band Laboratory Oscilloscope

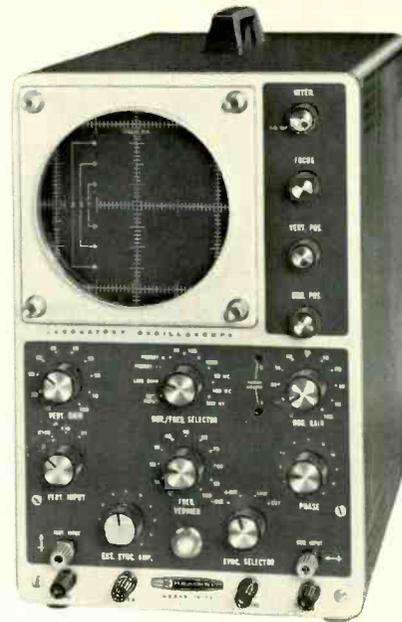
• 5 mc bandwidth • Heath patented sweep circuit—10 cps to 500 kc • Push-pull vertical & horizontal amplifiers • Circuit board construction • Facilities for two preset adjustments in the horizontal sweep circuit for returning to often-used sweep frequencies • Up to 50% savings over equivalent oscilloscopes

**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.

**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 most of your oscilloscope requirements . . . compare the specifications.

Kit IO-12, 24 lbs. . . . No money down, \$8 mo. . . . . \$76.95  
 Assembled IO-12, 24 lbs. . . . No money down, \$12 mo. . . . . \$126.95  
 Export model available for 115/230 VAC, 50-60 cps; write for prices.  
 See Page 65 for comb. offer with EF-2 Applications Course. . . . \$84.95



Kit \$76.95  
 Wired \$126.95

Kit Form or  
 Factory Assembled

**IO-12 SPECIFICATIONS—(Vertical) Sensitivity:** 0.025 volts RMS per inch at 1 kc. Frequency response (referred to 1 kc level):  $\pm 1$  db 8 cps to 2.5 mc; +1.5 to -5 db, 3 cps to 5 mc; response at 3.58 mc, -2.2 db. **Rise time:** 0.08 microseconds or less. **Input impedance:** (AT 1 KC) 2.7 megohms at X1; 3.3 megohms at X10 and X100. **(Horizontal) Sensitivity:** 0.3 volts RMS per inch at 1 kc. **Frequency response:**  $\pm 1$  db 1 cps to 200 kc;  $\pm 3$  db 1 cps to 400 kc. **Input impedance:** 4.9 megohms at 1 kc. **Sweep generator:** Range—10 cps to 500 kc in five steps, variable, plus only 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 cycles AC at 80 watts; fused. **Dimensions:** 14 1/4" H x 8 3/4" W x 16" D.

## Oscilloscope Accessories

### 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.

Kit 337-C, 1 lb. . . . . \$3.50  
 Assembled 337W-C, 1 lb. . . . . \$4.50

Kit Form or  
 Factory Assembled

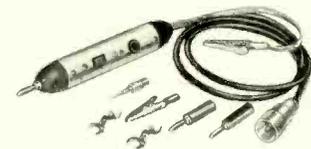
337-C  
 \$3.50



### 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.

Kit PK-1, 1 lb. . . . . \$4.95



PK-1  
 \$4.95

### Heathkit Electronic Switch

• All-electronic switching •  $\pm 1$  db, 0-100 kc response • Separate gain controls for each channel • Four switching rates - 150, 500, 1500, and 5000 cps • 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. Measures 9 1/2" W x 6 1/2" H x 5" D.

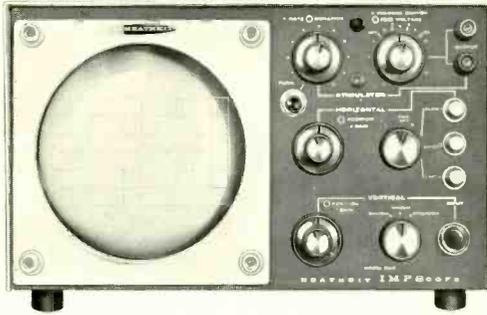
Kit ID-22, 7 lbs. . . . . \$23.95

ID-22  
 \$23.95



# Heathkit Electronics Puts Modern Instrumentation In

## Heathkit IMPScope Brings New Insight To Life-Science Classes



EV-3  
\$160<sup>00</sup>

IMPScope Achieved Immediate Success In High School Biology Classes . . .

- 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

IMPSCOPE IS AN INEXPENSIVE INSTRUMENT for the study of physiological phenomena of man and common invertebrates. Investigates electrical activity of heart, nerves, muscles, & brain. It consists of a high-gain oscilloscope with a built-in stimulator, and can be augmented with accessories to perform many additional functions for the study of biology and physiology.

IMPSCOPE BRINGS MODERN INSTRUMENTATION into your classroom, fulfilling a vital need in the teaching of life science. Can be easily understood by high school students!

### IMPScope Lets Students "See" Physiological Phenomena

#### WHAT IT DOES

- Clearly Demonstrates EKG • Shows Human EKG • Shows Frog Sciatic Nerve Impulse • Shows Frog EKG • Shows Plethysmographic Pulse Pressure Display • Plus Many More Lab And Classroom Uses



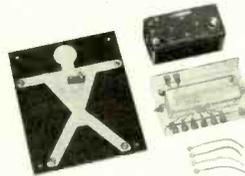
#### Included With IMPScope

- Input termination and calibrator
- Human EKG electrodes • EKG paste • Connecting leads

Has Become An Integral Part Of Many College Physiology Courses

- Kit EV-3, 29 lbs. . . . . \$160.00
- Assembled EVW-3, 27 lbs. . . no money dn., \$23 mo. . . . . \$250.00
- Export model available for 115/230 VAC, 50-60 cps; 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:  $\pm 3$  db from 0.25 to 2500 cps. 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 cps AC. Dimensions: Overall, 11 1/2" W x 7 1/2" H x 19 1/2" D. Net weight: 17 1/2 lbs.



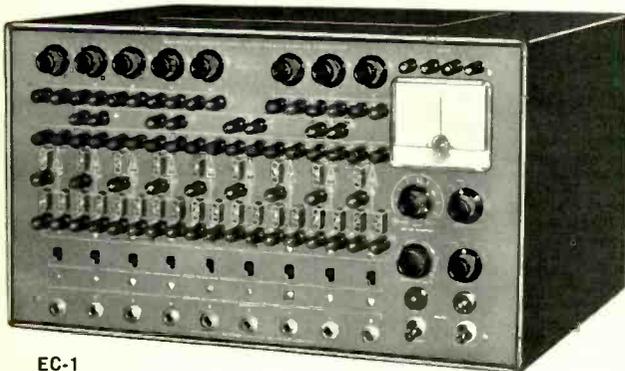
### IMPScope Accessories

EVA-3-1 \$35<sup>00</sup>

#### 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. 3 lbs. . . \$35.00
- EVW-3-1, Factory Assembled Accessories, 3 lbs. . . . . \$50.00



EC-1  
\$199<sup>95</sup>

- 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

EC-1 SPECIFICATIONS—Amplifiers: Open loop gain approximately 1000. Output—40 +60 volts at 7 ma. Power supplies:  $\pm 300$  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 cps), to repeat the solution any number of times; permits observation of effect of changing parameters on solution. Meter: 50-0-50  $\mu$ a movement. Power requirements: 105-125 volts, 50/60 cycles, 100 watts. Dimensions: 19 1/2" W x 11 1/2" H x 15" D.

Large ES-Computer and individual components still available. Address your inquiries to Heathkit, Cooksville, Ontario, Canada.

### Heathkit Educational Analog Computer . . . Lowest Cost Computer Of Its Quality On The Market

NOW THE ENTIRE RANGE OF ANALOG COMPUTER ELECTRONICS IS WITHIN EASY REACH OF ANYONE. The EC-1 can be set up to illustrate and solve a multitude of complex mechanical and mathematical problems.

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

( $\frac{d^2x}{dt^2} + \frac{C}{M} \frac{dx}{dt} = 0$  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, 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, 49 lbs. . . . . \$199.95
- Export model available for 115/230 VAC, 50-60 cps; write for prices.

# Your Classroom . . . Within Your Budget



## "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), 4 lbs. . . . \$8.95
- Kit EF-1-3, includes EF-1 and IM-11 VTVM, p. 46, 9 lbs. . . . \$32.50
- No money down, \$5 mo. . . . \$39.95
- Kit EF-1-4, includes EF-1 and IM-13 VTVM, p. 47, 11 lbs. . . . \$39.95
- No money down, \$5 mo. . . . \$5.00
- 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

COMPLETE AND THOROUGH SUBJECT COVERAGE! Well-organized and informative textbook is of maximum help to beginners . . . provides a fresh, new approach to the basic theory and application of the oscilloscope to professionals! Besides the 169-page text, which is written in plain, simple-to-understand language, the EF-2 includes a special test chassis for performing interesting and educational experiments . . . clarifies material by dramatically illustrating various points outlined in the text.

In addition you learn the general principles of electronics, and maintenance, service, and special applications of the scope. "Solderless" spring clip connectors allow fast, easy circuit changes and permit using parts again and again, once initial soldering is done. Order with either the IO-21 or IO-12 oscilloscopes, and enjoy the 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 62, 16 lbs. . . No money down, \$7 mo. . . . \$62.95
- Kit EF-2-4 includes EF-2 and IO-12 Oscilloscope, page 63, 28 lbs. . . No money down, \$9 mo. . . . \$84.95
- Manuals only for EF-2 (single copy) . . . \$5.00
- . . . (10 or more copies) . . . \$3.00 each.



EF-2  
"Text & Chassis"  
\$9.95

EF-2-3  
"Text & Instrument"  
\$62.95

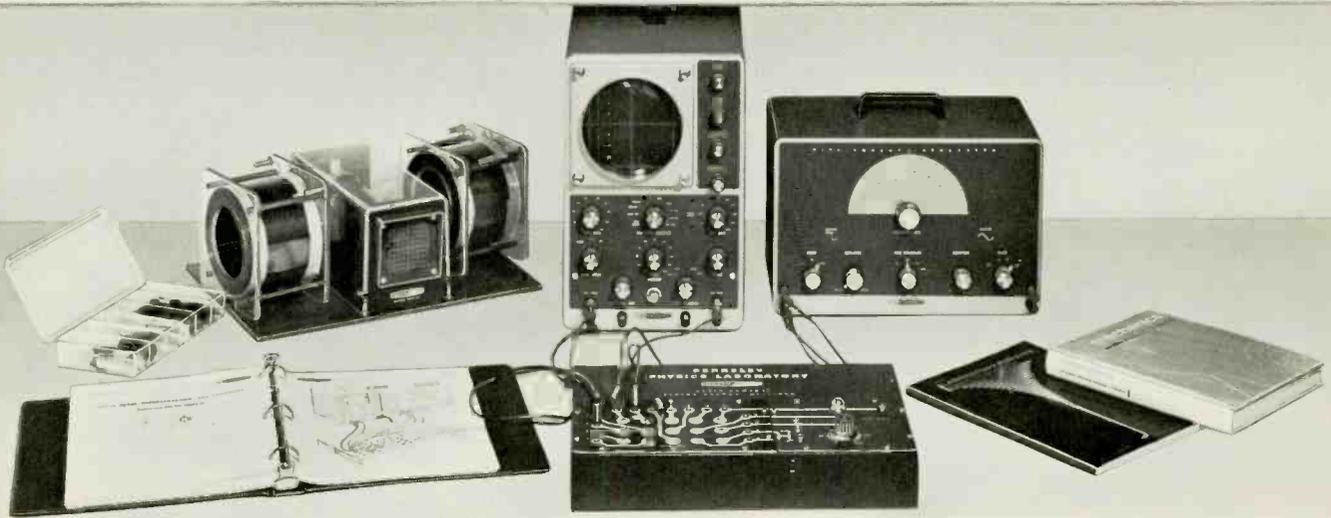
## "How To Understand And Use Your Signal Generator"



- 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

IDEAL FOR CLASSROOM, FOR SELF-TEACHING, OR AS REFERENCE FOR PROFESSIONALS. The EF-3 Technical Applications course shows the proper use, and provides an understanding of signal generators in servicing and alignment. The informative text, written in plain everyday language covers theory, function and use of RF and Audio frequency generators. Student performs interesting experiments, using the special test chassis furnished, to illustrate & clarify text material. Special "solderless" spring-clip connectors make circuit changes quick & easy after initial soldering is done. Textbook contains a wealth of information that serves as a handy reference for years to come. Buy in combination with IG-102 or IG-82 generators for extra savings!

- 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. 53 10 lbs. . . No money down, \$5 mo. . . . \$37.95
- Kit EF-3-3, Includes EF-3 and IG-82, pg. 56, Sine-Square Generator, 17 lbs. . . No money down, \$7 mo. . . . \$61.95
- Manuals only for EF-3 (single copy) . . . \$5.00
- . . . (10 or more copies) . . . \$3.00 each.



## Heath Berkeley Physics Laboratory

• Complete 2-student college physics lab stations • Same Heath educational and professional test instruments as used in the development of the Berkeley Physics Laboratory • Available in assembled or kit form to fit budget requirements • Instruments may be purchased separately or as complete lab stations • Instruments can be used for an unlimited spectrum of laboratory work—course is not bound to an inflexible list of predetermined experiments and exercises • Standard components provide replacement parts for test chassis

HEATH, MANUFACTURER OF TEST INSTRUMENTS & MATERIALS AS USED AT BERKELEY . . . now provides complete instrumentation facilities for outfitting Berkeley-type college physics laboratories. One basic Heath 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, & D of the course can be supplied separately as they continue to become available. Order components for Part A along with the instrumentation for initial outfitting.

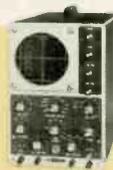
A MODERN AND COMPLETE LAB SYSTEM . . . The Heath Berkeley Physics Laboratory Part A consists of six high quality test instruments and two laboratory component sets plus battery set. Each instrument is rated for professional research and testing and will provide classroom experience comparable to the 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.

A NEW IDEA . . . a test chassis that makes breadboarding practical—provides positive contact through solderless connections, plus low stray inductance and capacitance, assuring accurate experimental results. The use of standard components permits "open-ended" experiments at very low cost. Component shells of the cathode ray tube and deflection coil set are transparent allowing students to make complete visual inspections.

COMPLETE SPECIFICATIONS ON EACH INSTRUMENT . . . are shown in this Heathkit catalog on the indicated pages. 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! Order No. 595-764 . . . \$2.00

PLACE YOUR ORDER NOW! . . . to assure delivery in time to meet your class program.

Kit EP-100A, complete 2-student lab station with Part A, 110 lbs. \$396.72  
 Assembled EPW-100A, complete 2-student lab station with Part A, 110 lbs. \$545.26  
 No Further Educational Discount Available on EP-100A, EPW-100A or its individual components. The regular Heathkit instruments are subject to educational discount.



**Laboratory 5" Oscilloscope**  
 Kit 10-12S . . . \$76.95  
 Assembled 10W-12S . . . \$126.95  
 Specifications same as 10-12, pg. 63, plus special jacks that permit connection to the HV and sweep circuits of the scope.



**RF Signal Generator**  
 Kit IG-102S . . . \$30.00  
 Assembled IGW-102S . . . \$60.00  
 Specifications same as IG-102, pg. 53, except that accuracy is 3% and includes RF jacks



**Regulated Power Supply**  
 Kit IP-32 . . . \$56.95  
 Assembled IPW-32 \$84.95  
 Specifications: pg. 59.



**Sine-Square Wave Generator**  
 Assembled EUW-27 \$94.00  
 Kit IG-82 . . . \$51.95  
 Specifications IG-82: pg. 56.



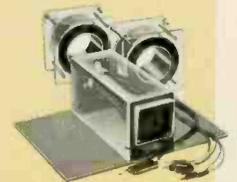
**Vacuum Tube Voltmeter**  
 Kit Model IM-11 . . . \$24.95  
 Assembled IMW-11 \$39.95  
 Specifications: pg. 46.



**Transistorized Power Supply**  
 Assembled EUW-17, 0-35 VDC. pg. 71 . . . \$20.00

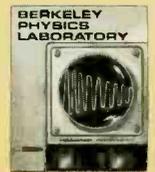
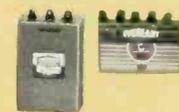


**Test Chassis and Small Parts**  
 includes binder & lab manual for Part A. Assembled. EPW-14, 9 lbs. \$60.00

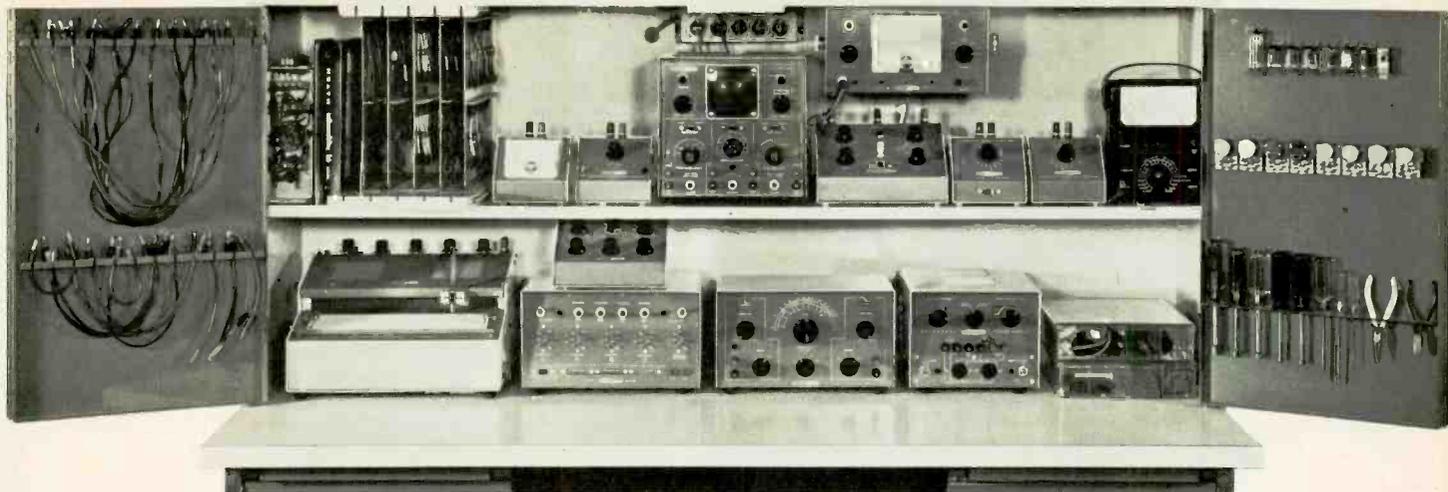


**Cathode-Ray Tube & Deflection Coil Set**  
 includes binder & lab manual for Part A. Assembled EPW-24, 33 lbs. \$115.00

**EPA-10-1 Battery Set For Berkeley Physics Lab**  
 Consists of one 0-22½-45 V. battery & one 0-1½-3-4½-6-7½ V. battery. 2 lbs. \$5.00



All Part A units available for immediate delivery September 10, 1965. For more information, send for FREE EP-100A folder.



## Malmstadt-Enke Instrumentation Lab by Heath . . . A Coordinated System Of Instruments, Accessories & Text For Education And Research Purposes

• A complete electronics lab for scientists & engineers • All equipment factory wired & tested • Ideal for teaching electronics to both graduate and undergraduate scientists • Perfect for every day use in research labs • "Solderless" spring-clip connectors in experimental parts groups allow fast, easy circuit changes • Authoritative Malmstadt-Enke textbook "Electronics For Scientists" • Multi-purpose units with features not matched at any price

**COMPLETE, COORDINATED ELECTRONICS LABORATORY!** Consists of special experimental chassis and parts, factory-assembled test & lab instruments, and an informative textbook . . . fills countless requirements in scientific, educational and research applications. The EU-100A "Malmstadt-Enke Instrumentation Lab" was engineered by Heath in association with Dr. Howard Malmstadt, University of Illinois, and Dr. Christie Enke, Princeton University . . . originators of the system and authors of the widely acclaimed text, "Electronics For Scientists." **IDEAL FOR ALL SCIENCES!** Provides chemists, physicists, engineers, medical scientists, biologists, students and research workers with a firm working knowledge of circuits and modern instrumentation that will prove invaluable in their work.

**WIDELY ACCEPTED IN ACADEMIC AND INDUSTRIAL LABS!** Used by colleges, universities and industrial institutions at all levels . . . technician, undergraduate, graduate and post-doctoral.

**SPECIAL-PURPOSE INSTRUMENTS!** Many units within the EU-100A station serve multi-purpose applications. For example, the EUW-20A Servo-Chart Recorder is useful in learning about servo systems and null-point recorders . . . recording pressure, speed, temperature, strain, light radiation, etc. in research or development labs when used with suitable transducers . . . and can be modified with a simple plug-in adapter to provide a sensitive and accurate pH meter for research & control labs. **NEW! ALL-STEEL DESK-TOP CABINET** . . . (illustrated above) holds all EU-100A components and instruments. Everything is in line-of-sight and at fingertip control. 10 labeled instrument power outlets are controlled by a single on/off switch. Sturdy brackets keep tools, leads, and all other parts within easy reach. Requires 30" x 60" desk or bench space. Entire system can be set up and operating within a few hours after delivery.

**PURCHASE AS A GROUP OR SEPARATELY!** All components are available as a complete system may be purchased separately in select groups, or as individual units for specific applications.

**SPECIAL BOOK COMBINATION OFFER!** Discover the many practical uses of the famous Malmstadt-Enke Lab Series. Order both the EUA-11 manual and EUP-11 text, "Electronics For Scientists," and get the manual FREE! It's a regular \$14 value for only \$11.50. Order No. EUP-11 (EUA-11 manual available separately at \$2.50).

### FREE FOLDER!

Gives full descriptions of entire Malmstadt-Enke Lab System and components. Complete with specifications and prices. Write for your free copy today.



**EU-SERIES INSTRUMENTATION BEGINS WITH BASIC ELECTRONICS . . . ENDS WITH SOPHISTICATED INSTRUMENTS FOR TEACHING OR RESEARCH.** Experimental chassis and small parts can be used in conjunction with the "Electronics For Scientists" text as educational laboratory apparatus, or as components for "trial-circuitry" in research and development. EU-Series instruments are applicable for research . . . Heath now supplies plug-in modular chassis for precision pH measurement and for polarographic techniques in chemistry. Heath will offer additional modular electronics . . . the Malmstadt-Enke Laboratory series will continue to grow!



Basic circuits can be constructed, tested, and modified in a fraction of the time required for conventional soldered circuits.



pH module is fully described on page 73.

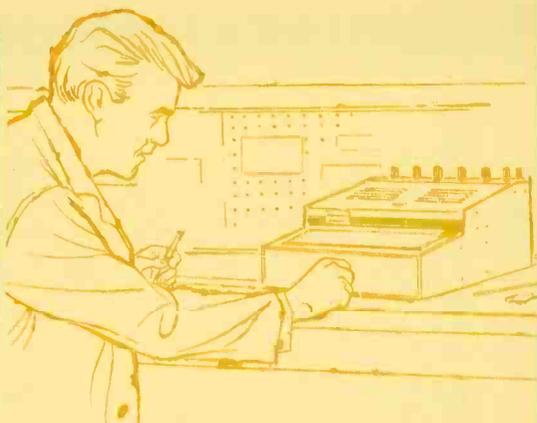


Polarography module is fully described on page 72.

### Buy The Complete M-E Station And Save!

EUA-11 Manual	\$ 2.50
EUP-11 Text, "Electronics for Scientists"	\$ 11.50
EU-13A Universal Experimental Chassis & Parts	\$ 177.00
EU-14A Special Experimental Chassis & Parts	\$ 64.00
EUW-15 Assembled Universal Power Supply	\$ 75.00
EUW-16 Assembled Voltage Reference Source	\$ 65.00
EUW-17 Assembled Transistorized Power Supply	\$ 20.00
EUW-18 Assembled Lab Meter With Shunts	\$ 22.00
EUW-19A Assembled Operational Amplifier System	\$ 135.00
EUW-20A Assembled Servo Chart-Recorder	\$ 199.00
EUW-24 Assembled VTVM	\$ 62.00
EUW-25 Assembled DC Oscilloscope	\$ 163.00
EUP-26 Assembled Weston 980 VOM	\$ 55.00
EUW-27 Assembled Sine & Square Wave Generator	\$ 94.00
EUW-28 Assembled Resistance Substitution Box	\$ 16.00
EUW-29 Assembled Capacitance Substitution Box	\$ 14.00
EUW-30 Assembled Decade Resistance	\$ 34.00
GH-25 Deluxe Tool Set	\$ 16.95
<b>Total</b>	<b>\$1225.95</b>
<b>EU-100A Special Group Price (Includes all items above)</b>	<b>\$1100.00</b>
(Educational Institutions qualify for additional group discount)	
Export models available for 115/230 VAC, 50-60 cps; write for prices.	
EUP-22A, All-steel desk top cabinet	\$130.00

# Heath-Built Servo-Chart Recorder

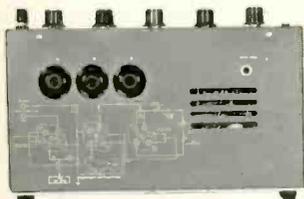


EUW-20A  
**\$199<sup>00</sup>**

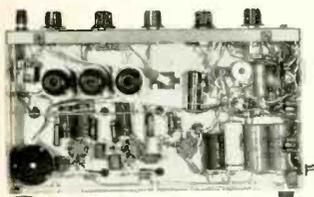
All Operating Controls Are On One Panel, Providing A Simple And Yet Complete Control Center.



- Ultimate in functional design • True potentiometric null-point balance on all ranges • Full provisions for plug-in modular accessories • 10" pen travel • 0.1 second per inch response • 5 ranges—10 to 250 mv • Repeatability 0.2%—accuracy better than 1% • Uses inexpensive, practical cartridge-type pen • Rapid chart advance, pen lift, paper tear guide • Time scale easily altered with interchangeable chart drive motors • Completely assembled & tested



Standard 5-pin connectors and circuit diagram screened on the back panel permit use of plug-in modules for specific requirements.



Back view with cover removed shows neat layout of circuit components. Easy access to all parts make it ideal for teaching servo design.

## EUW-20 CHART PAPER PRICES

Part 445-8	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.

**PRECISION RECORDING FACILITIES AT LOW COST!** The Heath model EUW-20A is a precision laboratory-type self-balancing potentiometric recorder that offers many unique operational features at tremendous dollar savings. High quality is emphasized throughout the design of the EUW-20A to provide chemists, physicists, medical researchers, engineers, and other scientists with an accurate, dependable recorder that will fill a multitude of research and control applications. It can be used to record pressure . . . speed . . . temperature . . . strain . . . pH . . . light radiation and many other phenomena when used with suitable transducers.

**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-20A to a versatile and highly sensitive direct-reading and/or recording pH/MV electrometer (see page 73). Additional factory-assembled modules are forthcoming. However, 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. 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. Optional chart-speed motors are also available at low cost for specific laboratory functions. Easy access to motor mounts permits fast, easy change to other speeds.

**ORDER THE HEATH SERVO-CHART RECORDER . . .** for outstanding versatility and accuracy, for the ultimate in functional design—all at the lowest cost. Price includes complete EUW-20A instruction manual.

- EUW-20A, 20 lbs. . . . . \$199.00
- EUA-20-1, Blank plug-in adapter chassis, 3 lbs. \$9.00

## Chart Drive Motor Assembly

Wt. 1 lb. Price ea.			
EUA-20-2	.1 inch/min.	EUA-20-7	5.0 inch/min.
EUA-20-3	.2 inch/min.	EUA-20-8	8.0 inch/min.
EUA-20-4	.5 inch/min.	EUA-20-9	12.0 inch/min.
EUA-20-5	1.0 inch/min.	EUA-20-10	2.0 inch/hour
EUA-20-6	4.0 inch/min.		

**EUW-20A SPECIFICATIONS — Chart Paper:** Grid width, 10". Length, 120 foot roll. Markings, 0-100, right to left. **Chart Speed:** 2 inches per minute (standard). **Chart Span:** Five fixed ranges: 10, 25, 50, 100, and 250 mv, plus a sensitivity control to permit adjustment for any value from 10 to 250 mv. Also external position available for special plug-in ranges. **Pen:** Standard fountain pen, cartridge-type. **Balancing Time:** 0.1 second per inch, 1 second full scale (10"). **Error** (includes dead zone): Less than 1% of full scale for all ranges. 10 to 250 mv. **Repeatability:** 0.2%. **Maximum Source Resistance:** 50 K ohm. **Reference System:** Mercury cell. **Reference Cell Life:** 300 hours (approx.). **Power Requirements:** 105-125 volts, 60 cps AC; 50 watts. **Dimensions:** 13 3/4" W x 8 3/4" H x 13 3/4" D.

# Heath-Built Malmstadt/Enke Laboratory Instruments



## EUW-19A Operational Amplifier

- Four high-gain operational amplifiers plus booster amplifier
- Standard 5-pin amplifier terminals accessible on front panel
- Completely self-contained with built-in power supplies
- Amplifier balance controls on front panel
- Fully assembled and tested

**FEATURES HIGH GAIN, LOW DRIFT, RAPID RESPONSE, AND WIDE FLEXIBILITY.** This operational amplifier system represents an outstanding value in lab facilities. It can be connected as a constant current source, a controlled potential source, a linear sweep generator, or as a servo-system simulator. Addition, subtraction, integration and differentiation problems can also be programmed for countless applications in measurement, computation and control work.

**SOLVES A GREAT RANGE OF PRECISION ELECTRICAL MEASUREMENT AND CONTROL PROBLEMS.** See chapter eight of the Malmstadt/Enke text, "Electronics for Scientists," EUP-11, for a full description of the capabilities of operational amplifiers.

**COMPLETE INSTRUMENT MANUAL INCLUDED.** Discusses the circuitry, theory and operation of the EUW-19A in detail.

- EUW-19A, 22 lbs. . . no money dn., \$13 mo. . . . . \$135.00
- EUA-19-1, Single 5-Amplifier Adapter Chassis, 3 lbs. . . . . \$9.00
- EUA-19-3, 5 Individual Adapter Chassis, 4 lbs. . . . . \$10.00

EUW-19A  
**\$135<sup>00</sup>**

**EUW-19A SPECIFICATIONS—OPERATIONAL AMPLIFIERS:** DC Gain, open loop: 21,000 (87 ± 1 db). Frequency response: to 450 kc. Voltage range: -50 V DC to +50 V DC at input and output with a 50 K ohm load. Output current: -1 ma to +1 ma with 50 K ohm load. Output impedance: Less than 1.5 ohms. Phase shift: Less than 1 degree at 100 kc. Rise time: 12 microseconds. Drift: Less than ±8 mv/day under normal conditions after 48 hours, or more, aging period. Amplifier 1 bias only: May be switched for Follow 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 cps. 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 12¾" D.



EUW-24  
**\$62<sup>00</sup>**

## EUW-24 Vacuum Tube Voltmeter

- Single AC/Ohms/DC probe
- 7 AC, 7 DC, & 7 Ohms ranges
- Easy to read 4½" meter
- 1% precision resistors
- Factory assembled and tested
- Front panel Servo Recorder connections

The Heath EUW-24 VTVM Is Especially Designed For Laboratory Use . . . and features maximum VTVM functions and versatility. All calibration and zero-set controls are available at the front panel, and the meter output is accessible through panel-mounted banana jacks for connection to a recorder such as the EUW-20A for permanent records of necessary measurements or for application to experimental setups. Gimbal mounting bracket is included for under-shelf installation. Single-probe and test lead provided.

EUW-24, 6 lbs. . . no money dn., \$7 mo. . . . . \$62.00  
**EUW-24 SPECIFICATIONS—Meter scales:** DC & AC (RMS): 0-1.5, 5, 15, 50, 150, 500, 1500 volts full scale. AC peak-to-peak: 0-4, 14, 40, 140, 400, 1400, 4000. Resistance: 10 ohm center scale x1, x10, x100, x1000, x10K, x100K, x1 meg. Measures 0.1 ohm to 1000 megohms with internal battery. Meter: 4½" 200 uq 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 cps to 1 mc (600 ohm source). Battery: 1.5 volt, size "C" flashlight cell. Power requirements: 105-125 volt 50/60 cycle AC 10 watts. Dimensions: 6½" H x 11½" W x 5" D.



EUW-25  
**\$163<sup>00</sup>**

## EUW-25 3' DC Oscilloscope

- Identical vertical & horizontal AC or DC coupled amplifiers
- DC to 400 kc bandwidth
- Rise time, less than 1.5 microsecond
- Recurrent sweep generator, 5 cps to 50 kc 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

The identical DC coupled vertical and horizontal amplifiers make this scope a versatile x-y plotter. This oscilloscope is ideal for application to distortion detection, phase angle measurement, hysteresis observation, analog computer readout, and biological and physiological instrumentation techniques requiring conventional to very slow sweep rates.

EUW-25, 18 lbs. . . no money dn., \$16 mo. . . . . \$163.00  
**EUW-25 SPECIFICATIONS—(Vertical and horizontal channels identical):** Bandwidth: DC to 400 kc (3 db point). Sensitivity: 0.1 V (peak-to-peak) per ¼" (uncalibrated). Attenuator: 3-position, compensated type. Gain control: Continuously variable. Input impedance: 3.6 megohms shunted by 35 mmf. Coupling: Either AC or DC, switch-selected. Relative phase shift between channels: Less than 5°. Sweep generator (recurrent type): Linear saw-toothed produced by multivibrator type generator covering 5 cps to 50 kc 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 cycle AC at 100 watts max. Dimensions: 9¾" H x 9¾" W x 11¾" D.

Heath Offers You Incomparable "Extra" Customer Service

# Heath-Built Malmstadt/Enke Instruments



EUIW-15  
\$75<sup>00</sup>

## EUIW-15 Universal Lab Power Supply

- Functions as a full-wave, half-wave, bridge or voltage doubler power supply • Less than 10 millivolts ripple, jitter & noise
- Regulated B+, 200 to 350 volts DC @ 0 to 100 ma • Unregulated output, 100 to 500 volts DC in five ranges • Separate power & high voltage on/off switches • Fully assembled & tested

A MULTI-PURPOSE LAB POWER SUPPLY. Spring-clip connectors on jumper wires permit fast, simple circuit changes—voltages and filtering, etc. Partial schematic diagrams are screened inside the chassis for handy reference. Compare these features and specifications to your requirements.

EUIW-15, 15 lbs... no money dn., \$8 mo. .... \$75.00

The following specifications are for the EUIW-15 Power Supply when it is wired for voltage-doubler operation.

**EUIW-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  $\pm 1$  volt for a  $\pm 10$  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 cps. 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 AC, 50/60 cps, 85 watts. Dimensions: 8 1/4" W x 6 1/2" H x 12 1/2" D.



EUIW-16A  
\$65<sup>00</sup>

## EUIW-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

A VALUABLE LABORATORY INSTRUMENT. The voltage is accurately adjustable from 0 to 100 volts DC for calibration purposes, for bias or zero suppress voltages or for other applications where current drain is low. Accurate potentiometric voltage measurements can be made with this instrument. Excellent for meter or recorder calibration.

EUIW-16A, 6 lbs... no money dn., \$7 mo. .... \$65.00

**EUIW-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 cps. Dimensions: 5 1/4" H x 8 1/4" W x 8" D.



EUP-26  
\$55<sup>00</sup>

## 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

A HIGHLY-SENSITIVE, PRECISION VOM. A favorite instrument of thousands of physics and electronics laboratory technicians and teachers, the Weston model 980 Mark II Analyzer is complete with special switch-selected damping to reduce the effects of vibration during transportation and handling in your lab. Meter is diode protected against overload.

EUP-26, 4 lbs... no money dn., \$6 mo. .... \$55.00

**EUP-26 SPECIFICATIONS—**Sensitivity: 20,000 ohm/volt DC, 1000 ohm/volt AC. Range: DC Volts; 1.6-8-40-160-400-800-4000. AC Volts; 1.6-8-40-160-400-1600. DC Current; 80 microamperes, 1.6-8-80-800 milliamperes, 8 amperes. Ohmmeter: Rx1, Rx10, Rx100, Rx1000, Rx10,000. Decibels (DB): -15 to +6, -1 to +20, +13 to +34, +25 to +46, +33 to +54. Accuracy:  $\pm 2\%$  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.  $\pm 2$  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  $\Omega$ , 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 1/8" high x 3 1/4" deep (overall). Net weight: 3 lbs. 1 oz. Shipping Weight: 4 lbs.



EUIW-27  
\$94<sup>00</sup>

## EUIW-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 cps to 1 mc in 5 bands • Factory assembled and tested

VERSATILE LABORATORY-TYPE SINE-SQUARE WAVE SOURCE ... Separate output attenuators provide steps of 10, 1, and 0.1 volts for both sine and square wave outputs with an extra 0.01 volt step for the sine wave signal. Dial calibration and tracking are excellent.

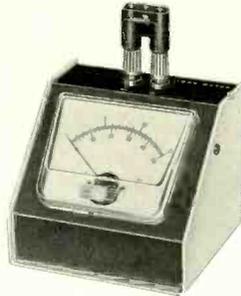
EUIW-27 ... 14 lbs... no money dn., \$10 mo. .... \$94.00

**EUIW-27 SPECIFICATIONS—**Sine wave: Frequency range: 20 cycles to 1 mc. 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 cycles. Frequency response:  $\pm 1.5$  db 20 cycles to 1 megacycle. Square wave frequency range: 20 cycles to 1 mc. 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 cycles, 55 watts. Dimensions: 13" W x 8 1/4" H x 7" D.

# Separate Or As A Complete Lab



EUW-18  
**\$22<sup>00</sup>**



## 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

A GENERAL PURPOSE LABORATORY METER. Designed as part of the EU-100A Instrumentation Laboratory, the Heath EUW-18 has plug-in terminals for 3/4" dual banana plugs (four plugs are included). Shunt wire and two precision resistors are included. Dimensions: 4 3/4" H x 4 3/4" W x 4 1/4" D.

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  
**\$16<sup>00</sup>**



## 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 3/4" dual banana plug

IDEAL FOR OUTFITTING PHYSICS OR ELECTRONICS LABORATORIES . . . Although the EUW-28 is primarily intended as a component of the Malmstadt-Enke Station, its compact size (4 1/2" L x 4 3/4" W x 5" H), and wide selection of resistance values make it well suited for general purpose use.

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  
**\$20<sup>00</sup>**



## 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

COMPACT, DEPENDABLE . . . the all solid-state EUW-17 measures only 4 3/4" H x 4 3/4" W x 4 1/2" D. A pilot light provides insurance against leaving equipment "on" after class time. Binding posts accept 3/4" dual banana plugs. Ideal for laboratory or classroom.

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 cps, 9 watts.

EUW-29  
**\$14<sup>00</sup>**



## EUW-29 Capacitance Substitution Box

- Selects each of 18 capacitors 0.0001 mfd to 0.22 mfd • Matches dual banana plug with 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



(Complete Set  
Includes  
Over  
500 Parts)

EU-13A  
**\$177<sup>00</sup>**

## 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

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, 10 lbs... no money down, \$17 mo. .... \$177.00

Replacement resistor, capacitor and lead wire assemblies for the EU-13A are available. Write for price sheets.

EUW-30  
**\$34<sup>00</sup>**



## EUW-30 Six-Decade Resistance Box

- Selects values from 1 ohm to 999,999 ohms in 1 ohm increments • 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%. 3/4" terminal spacing for dual banana plugs. 7 1/8" W x 5" H x 6 5/8" D.

EUW-30, 3 lbs. . . . no money down, \$5 mo. .... \$34.00



# Modular Instrumentation From The

## NEW!

### Heath-Built Polarography Module

A versatile, precision instrument for investigating controlled potential electroanalytical measurements.



EUA-19-2  
\$185<sup>00</sup>

Polarography module plugs directly onto the Malmstadt-Enke Lab Operational Amplifier EUW-19A for complete instrumentation.

### The Heath Polarography System Features

- Provides controlled potential for conventional 3-electrode, or high resistance polarography • Includes an electronic sweep generator with 6 calibrated sweep rates • Measures electrode currents from 0.5 to 1000 microamperes full scale • 5 degrees of damping for recording d.m.e. currents • Provides continuously variable initial potential • Adjustable electrode current suppression • Linear charging current compensator • Includes very high input impedance follower amplifier for use with any reference electrode • Low impedance outputs for recording both current and voltage • Internal panel meter reads electrode current or voltage for manual polarography and amperometric titrations • Includes fast-response potential control section with external control inputs for use with AC, oscillographic, harmonic, phase, and other special polarography • Provides remote control of sweep start and reset • All zener diode references—no batteries or frequent calibration required

### The Heath Polarography System Capabilities†

- Conventional polarography (two-electrode, dropping mercury electrode, and recorder readout) • 3-electrode or non-aqueous polarography (with dropping mercury electrode and recorder readout) • Manual polarography • Amperometric titrations • Coulometry (with external coulometer and 2- or 3-electrode cell) • Cyclic polarography (with triangle generator and X-Y recorder readout) • AC polarography (with sine wave generator, AC amplifier, and recorder readout) • Oscillographic polarography (with triangle or sine wave generator and oscilloscope readout)

INNOVATIONS FROM HEATH . . . The Malmstadt-Enke Instrumentation Laboratory continues to grow in scope of application, providing basic electronics for education; the tools, instruments, and components for research and testing in electronics; and now a new and sophisticated instrument for research and education in chemistry. The Heath Polarography System enables educational institutions to investigate polarographic measurements where previously the cost would have been prohibitive. Its broad versatility opens up a new scope of potential research projects. **ELECTRONICALLY PRODUCED CONTROLLED POTENTIAL POLAROGRAPHY . . .** The Heath Polarography Module, in conjunction with the EUW-19A

Operational Amplifier, produces a controlled electronic sweep voltage accurate to 1%. For three electrode polarography, the control function maintains a uniformly varying electrode potential, as detected with the reference cell. The result is a linearly changing electrode potential which is independent of the potential between the solution and the counter (current supplying) electrode. The resulting fluctuations in the ion current appear as readout.

**EUA-19-2 SPECIFICATIONS\*:** Potential control: Max. output voltage:  $\pm 50$  v.; current:  $\pm 1$  ma. Stability:  $\pm 10$  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:  $\pm 3$  v. Electrode potential output resistance: 22 ohms. Initial potential source: Range:  $\pm 3$  v. Accuracy: 0.5%. Repeatability of adjustment:  $\pm 5$  mv. External control voltage inputs: Input impedance: 100K. Frequency response: down 3 db at 10 kc, 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:  $\pm 5$  v. Hold: will hold at any potential  $\pm 5$  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  $\pm 90$  microamperes in 2 ranges. Charging current suppression: up to 1 microampere/volt of sweep.

\*Plugged on front of Heath EUW-19A Operational Amplifier System and using 3-electrode cell and dropping mercury electrode.

Use the Malmstadt-Enke Series EUW-20A Chart Recorder for automatic recording of polarographic curves.

Relay circuits included synchronize the beginning of the electronic sweep with chart advance, providing an integrated instrumentation setup.

EUA-19-2 Polarography Module, 9 lbs. . . . .	\$185.00
EUW-19A Operational Amplifier, 22 lbs. . . . .	\$135.00
EUW-20A Chart Recorder, 23 lbs. . . . .	\$199.00
EUW-401 Complete Polarography System (consists of EUA-19-2, EUW-19A, EUW-20A), 54 lbs. . . . .	\$499.00

Further educational discounts available.

Note: The EUW-401 and EUA-19-2 will be available for shipment in September 1965. Place your order now.

†With suitable electrodes, function generators, and readout devices, the new Heath Polarography System will perform all the functions described.

# Malmstadt-Enke Laboratory

## Recording pH Meter/Recording Electrometer

The Heath EUW-301 pH Recording Electrometer can be used as a general-purpose laboratory pH meter or as a research instrument that can provide exacting pH and millivolt measurements. On all scales and at all times the electrometer operates as a true null-point instrument. This feature enables pH and millivolt measurement from very high to very low impedance transducers . . . acid-base titration curves, reaction-rate curves, oxidation-reduction titration curves, and stability curves can be readily obtained.

### Compare The Features And Price With Any Other Instrument

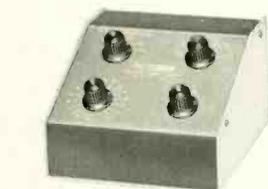
- **MULTI pH RANGES!** Full scale pH spans of 1, 2, 5, 10 and 14. Any 1 pH unit, 2 pH units (etc.) over entire pH region of interest can be switched for full scale on 10" scale or recorder chart.
- **MULTI MV RANGES!** Full-scale millivolt spans of  $\pm 50$ , 100, 200, 500, 1000 and 1400. There are 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.).
- **VERSATILE RECORDING SPEEDS!** Chart with 10" grid on 120' roll moves at selected rates. Standard rate of 2"/min.; other chart speeds as low as 2"/hr. and as high as 12"/min. are available with interchangeable motors.
- **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, 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 2000 megohms.
- **ADAPTS TO PLUGS OR MODULES!** Easily added because of the modular design and connector arrangement provided.



**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.

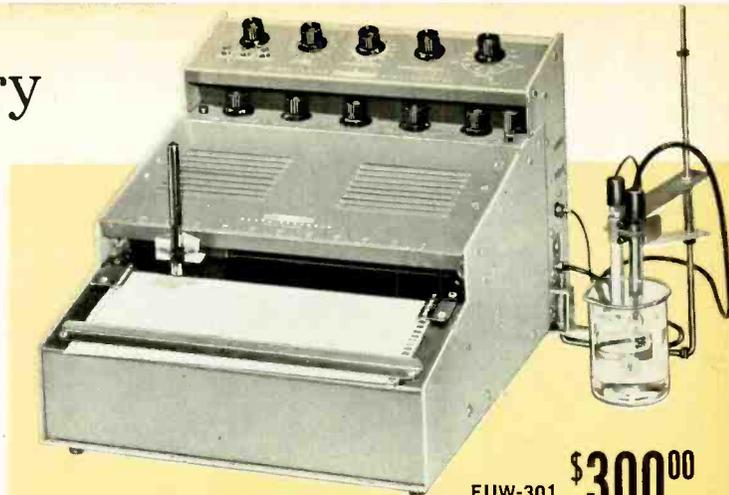
**EUA-20-12 pH Test Box . . . \$25.00**  
Provides quick pH meter check-out independent of cell or buffers through switch-selected output calibrated in pH units. 1% component accuracy. Checks linearity of pH meter from pH 0 to 14. Tests temperature compensation of pH meter. Checks for leakage currents 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.



**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".

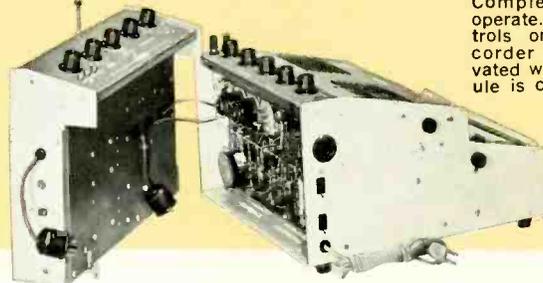
**EUA-20-16 Temperature Probe . . . \$18.00**  
Provides automatic temperature compensation of the EUW-301 Recording pH Electrometer. Simple plug-in connection.



EUW-301 **\$300<sup>00</sup>**



**pH Module Controls Complete, easy to operate.** Regular controls on Chart Recorder are inactivated when pH module is connected.



### 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 EUW-20A 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 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  $K_w$ , activity coefficients, 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 circuitry is connected for simple modifications by plug-in adapters. One plug-in adapter can convert the pH recording electrometer into a precision recording photometer for use in spectrophotometry, or an ionization detector readout for gas chromatography. The pH Recording Electrometer can be easily adapted for control of automatic burettes and for pH Stat.

**EUW-301, pH Recording Electrometer, 26 lbs.** (pH electrodes not included) . . . no money dn., \$28 mo. . . . **\$300.00**

**EUA-20-11, pH Module only, 8 lbs.** (converts Heath EUW-20A Servo-Recorder to pH Recording Electrometer) . . . **\$125.00**

**EUA-301-1, Parts Kit** (chopper, three 5-prong plugs and back cover) to convert recorder in EUW-301 to standard EUW-20A chart recorder. **\$20.00**

### Send For FREE Brochure!

A brochure describing the functions and applications of the EUW-301 pH Recording Electrometer in detail is yours FREE by simply dropping a note or card with your name & address to the Heath Company, Benton Harbor, Michigan 49023.





HR-10  
\$75.00



**Quality Throughout**

3-gang tuning capacitor for proper tracking of all circuits, neat layout, and sturdy mechanical construction assure fine performance, ease of assembly.



**HRA-10-1 Crystal Calibrator**

Handy plug-in accessory for the HR-10. Permits fast, accurate checks of dial calibration at any 100 kc point on dial. .\$.95

## Unsurpassed Value In Amateur Radio Equipment . . .

### Explore The Exciting World Of Amateur Radio With The Heathkit HR-10

• Amateur band coverage only for maximum stability & accuracy • Tunes SSB, AM & CW signals on 80 through 10 meter bands • Prebuilt, prealigned tuning unit for fast, simple assembly • Lattice-type crystal filter for high selectivity • Superheterodyne receiver with RF stage for extra sensitivity • Complete controls for full operating convenience • Attractive low-silhouette styling with green-gray color combination

STARTER, STAND-BY, OR FULL-TIME PERFORMER . . . build the HR-10! It's an exceptionally fine receiver any amateur would be proud to own. Covers the amateur bands 80 through 10 meters with each separately calibrated on the accurate, easy-to-read slide-rule type dial. This 7-tube superheterodyne receiver features an RF stage for high sensitivity, and a half-lattice crystal filter for sharp selectivity. Plus, there's a specially-designed detector circuit and beat oscillator for receiving AM, CW, and SSB signals.

THE PERFORMANCE FEATURES YOU FIND IN EXPENSIVE RECEIVERS. There's

a built-in "S" meter to indicate signal strength, and provisions for a plug-in 100 kc crystal calibrator. A standby/receive switch enables the HR-10 to "mate" with most transmitters. Even experienced amateurs choose the HR-10 for a stand-by receiver . . . separate AF and RF gain controls, and an AVC on/off switch mean big set versatility. Choose the HR-10 for your starter, stand-by, or full-time performer . . . you'll experience years of dependable performance.

Kit HR-10, 20 lbs. . . No money down, \$8 mo. . . . . **\$75.00**  
Kit HRA-10-1 Plug-in 100 kc crystal calibrator, 1 lb. . . . . **\$.95**

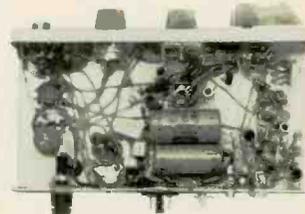
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**HR-10 SPECIFICATIONS**—Frequency coverage: 80 through 10 meters. IF frequency: 1681 kc. Sensitivity: 1 uv for 10 db signal-to-noise ratio. Image rejection: 40 db or better. Selectivity: 3 kc at 6 db, 9 kc 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 cycles, 50 watts. Dimensions: 13 3/4" W x 11 1/2" D x 6 1/2" H.

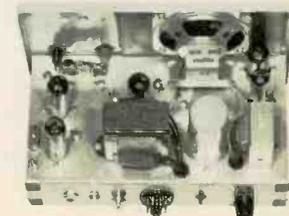


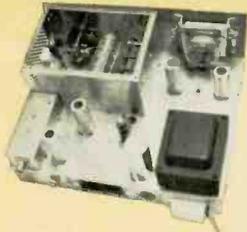
HW-29A  
\$44.95

**Point-To-Point Wiring,** and quality components assure easy assembly and trouble-free operation.

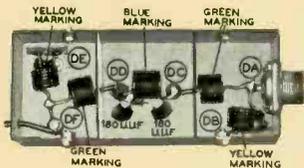


**Clean, Compact Design** through straight-forward component layout has made a notable reputation for the "Benton Harbor Lunch Box."





**Convenient Chassis Layout**  
Easy access to crystal sockets, shielded final amplifier, low-pass filter. Permits fast, easy assembly.



**Low Pass Filter**  
Built-in . . . reduces harmonic radiation, TV interference . . . assures clean signal output.



**DX-60A**  
**\$79.95**

## Through Heath Engineering And Design



### Heathkit DX-60A Phone & CW Transmitter

• 90 watts phone or CW—80 through 10 meters • Neutralized 6146 final amplifier • Built-in low pass filter • Grid block keying—easy access to crystal sockets • May be run at reduced power for novice operation • Transmitter mate of the HR-10

**NOVICE OR OLD-TIMER, CHOOSE THE DX-60A!** 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 page 76, an excellent VFO for the DX-60A). No transmitter in this price range will offer you more.

**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 the entire satisfying project a matter of a few evenings.

**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 Heathkit DX-60A.

**Kit DX-60A, 25 lbs. . . No money down, \$8 mo. . . . \$79.95**  
Export model available for 115/230 VAC, 50-60 cps; 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 cps, 225 watts. Dimensions: 13 1/2" W x 11 1/2" D x 6 1/2" H.

### Heathkit VHF Transceivers

#### The Popular "Benton Harbor Lunch Boxes"

• Neat, compact design—low in cost—versatile • Ideal for local net & emergency communications • Crystal-controlled transmitters—5-watt input • Tunable super-regenerative receivers with RF stage • Ideal for MARS, and CAP use • HW-30 2-meter model capable of operation on the new United States Coast Guard Auxiliary frequency, 143.28

**LOW-COST—PLUS NEAT, COMPACT DESIGN . . .** have made the Heathkit "Sixer" and "Twoer" the fastest selling units on the market today.

**IDEAL FOR LOCAL "NET" OR EMERGENCY OPERATIONS . . .** 5-watt, crystal-controlled transmitters and the receivers with 1 microvolt sensitivity are more than adequate for local net operations. Communications under "skip" conditions is unlimited.

**OPERATE "MOBILE" OR "FIXED."** 117 volt AC power supply is built-in for fixed-station operation and conversion to mobile use is easily accomplished with the Heathkit GP-11 vibrator power supply shown on this page. "Benton Harbor Lunch Boxes" include ceramic element microphone. Less crystal.

Kit HW-29A (6 meter), 9 lbs. . . No money down, \$5 mo. . . . \$44.95  
Kit HW-30 (2 meter), 9 lbs. . . No money down, \$5 mo. . . . \$44.95

### Heathkit Mobile Vibrator Power Supply

GP-11  
**\$16.88**

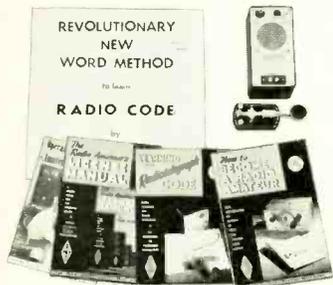


• Ideal for use with the "Sixer" and "Twoer"  
• Operates from 6 or 12 volt DC source • Silicon diode rectifiers • Small, compact—easy to install • Provides remote on/off switching • Heathkit green color

Kit GP-11, 6 lbs. . . . \$16.88

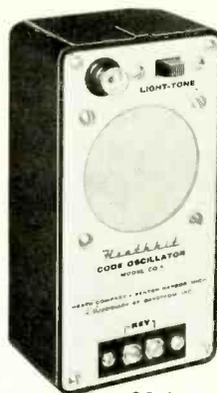
**GP-11 SPECIFICATIONS—**Power requirements: 6 volt version, 6.3 VDC @ 6.5 amperes or 12.6 VDC @ 3 amperes for rated output. Power output: 250 VDC @ 100 ma. 1CAS. Power rectifier: Two silicon diodes in voltage doubler circuit. Vibrator: Mallory type 1610 or equivalent. Vibrator frequency: Approximately 115 cps. Overall dimensions: 4 1/2" H x 6 1/2" W x 4 1/4" D.

## Here's The Way To Get Your Amateur Radio Operator's License



LEARN THE THEORY, PASS THE CODE TEST . . . through study at home in your spare time! Course includes 4 authentic American Radio Relay League handbooks: "How To Become A Radio Amateur"; "Radio Amateur's License Manual"; "Learning The Radio-Telegraph Code"; "Operating An Amateur Radio Station"; and code oscillator kit. Plus, 3 records that teach code by the revolutionary "word-method." Begin at 13 words-per-minute, continue at the same rate increasing high proficiency . . . then, pass your examinations and enjoy the exciting world of amateur radio!

- HDP-22, 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. . . 2 lbs. . . . . \$7.95



### Heathkit Transistorized Code Practice Oscillator

HERE'S THE WAY TO PRACTICE RADIO-TELEGRAPH CODE . . . assemble two CO-1's and practice with a friend—conversation in code improves both sending and receiving ability, and you can use your battery powered CO-1 anywhere. Authentic CW tone provides indoor practice — blinker light enables practice in reading Navy-type blinker communications at night. Switch selects speaker or light. Complete with standard telegraph key. Use 2 "C" cell batteries (not included).

CO-1  
**\$7.95**

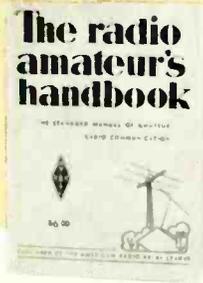
Kit CO-1, 2 lbs. . . . . \$7.95



**A** HG-10  
**\$34.95**



**B** HD-20  
**\$14.95**



**C** HDP-293  
**\$4.00**



**E** HD-11  
**\$14.95**



**D** HM-11  
**\$15.95**

### **A** Heathkit Variable Frequency Oscillator

CALIBRATED FOR AMATEUR BANDS 80 THROUGH 2 METERS! Provides 5 volts RMS signal—enough to drive most transmitters. HG-10 is the perfect VFO for the DX-60A, and what's more, it keys beautifully. Features 28-to-1 dial drive, plus "spot" switch for off-the-air tuning. Add this to your rig 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 mc, 7 to 7.425 mc, and 8 to 9 mc 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: 9 7/8" W x 6 1/2" H x 9 1/8" D.

### **B** 100 KC Crystal Calibrator

IDEAL FOR CALIBRATING COMMUNICATIONS RECEIVERS AND VFO'S . . . produces accurate signals every 100 kc from 100 kc to over 54 mc. Connects to receiver antenna terminal. Transistorized circuit has 100 kc crystal with 0.005% tolerance. Frequency trimmer adjustment. Uses single 9-volt battery (not included). Kit HD-20, 1 lb. . . . . \$14.95

### **C** 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

### **D** Heathkit Reflected Power Meter

SHOWS ANTENNA/TRANSMISSION LINE MATCH FOR RATING EFFICIENCY AND OUTPUT. Compares forward and reflected power to indicate SWR (standing wave ratio) from 1:1 to 3:1 and percent reflected power on the built-in meter. Handles well over 1 kw peak power on amateur bands 160 through 6 meters. Matches 50 or 75 ohm transmission lines, and may be left in line at all times. Kit HM-11, 3 lbs. . . . . \$15.95

### **E** Heathkit "Q" Multiplier

ACHIEVES HIGH RECEIVER SELECTIVITY THROUGH EFFECTIVE "Q" OF 4000! Operates with virtually any receiver with I.F. frequency between 450 and 460 kc. Peak or reject signals on AM, CW, or SSB. Both peak and notch are tunable within the receiver bandpass. Use sharply peaked tuning for CW reception, broad-peaked for AM, and rejection notch to "tune-out" interfering adjacent signal. Built-in power supply. Kit HD-11, 3 lbs. . . . . \$14.95  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

# Of Amateur Radio Equipment



## A Heathkit "Antenna" Transmitter Dummy Load

TEST TO A DUMMY LOAD AND AVOID THE CHANCE OF CREATING ILLEGAL INTERFERENCE! Heathkit "Antenna" provides the 50 ohm load you need for testing up to 1 kw transmitters. Standing Wave Ratio (SWR) is less than 1.5:1 for frequencies from 160 to 2 meters. Connect to transmitter through coax fitting . . . make relative power checks with any standard VTVM or VOM through phono jack provided. Oil coolant capacity, 1 gallon (oil not included).

Kit HN-31, 3 lbs. . . . . \$9.95

## B Heathkit PM-2 Handy RF Power Meter

USE IT FOR RF CHECK-OUT ON HAM, MARINE, COMMERCIAL, OR CB TRANSMITTERS. Indicates transmitter relative power output by sampling RF field near the transmitter antenna. Covers 100 kc to 250 mc. 0.3 volts RMS sensitivity at meter antenna for full-scale reading. Strong magnet holds PM-2 to any ferrous surface. No power connections or battery required.

Kit PM-2, 2 lbs. . . . . \$12.95

## C Heathkit Hybrid Phone Patch

HANDLE EMERGENCY TRAFFIC FAST! HD-19 transfers audio to 600 ohm telephone lines with separate transmit and receive gain controls to adapt to varying land line conditions. Compatible with VOX operated or PTT transmitters! Use with 3 to 16 ohm speakers and Hi-Z microphone input.

Kit HD-19, 4 lbs. No money down, \$5 mo. . . . . \$29.95

## D Heathkit Mobile Speaker

NEAT, COMPACT, IDEAL FOR USE WITH ALL HEATHKIT MOBILE EQUIPMENT. Rugged steel cabinet includes adjustable gimbal mounting bracket. 8 ohm, 4" x 6" oval, heavy-duty PM speaker produces excellent tone quality. Dimensions—6<sup>7</sup>/<sub>32</sub>" W x 4<sup>3</sup>/<sub>4</sub>" H x 2<sup>1</sup>/<sub>2</sub>" D.

Kit HS-24, 4 lbs. . . . . \$7.00

## E Heathkit Solid-State Mobile Power Supply For SSB Rigs

ESPECIALLY DESIGNED FOR HEATHKIT MOBILE SSB TRANSCEIVERS . . . provisions are included for remote operation. Primary and filament lines are circuit breaker protected. Husky ratings also enable broad general purpose use.

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 cps (approx.). Ambient temperature: —10° to 122° F. Dimensions: 7<sup>3</sup>/<sub>4</sub>" W x 7<sup>1</sup>/<sub>8</sub>" L x 2<sup>3</sup>/<sub>8</sub>" D. All voltages referenced at 13 VDC input.

## F Heathkit AC Power Supply For SSB Rigs

RECOMMENDED AC POWER SOURCE FOR HEATHKIT SSB TRANSCEIVERS! HP-23 was especially designed to power a wide variety of SSB rigs, and features excellent dynamic regulation to provide solid SSB signals—includes silicon diode rectifiers and provisions for remote switching of primary circuits. The useful range of output voltages also makes this a versatile general purpose power supply . . . check it for your needs.

Kit HP-23 AC Power Supply . . . 19 lbs. . . . No money down, \$5 mo. . . \$39.95

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

HP-23 SPECIFICATIONS—Power requirements: 120 volts AC, 50-60 cycles, 350 watts maximum. High voltage output: 820 volts DC no load; 700 volts DC @ 250 ma ±10%. AC ripple: Less than 1% @ 250 ma. Duty cycle: 150 ma continuous, to 300 ma @ 50%. Low voltage output: (High tap) 350 volts DC, no load; 300 volts DC @ 150 ma ±10%, (Low tap) 275 volts DC, no load; 250 volts DC @ 100 ma ±10%. Less than .05% AC ripple @ 150 ma, continuous duty to 175 ma. Fixed bias: —130 volts DC, ±10%, no load; —100 volts DC @ 20 ma. Adjustable bias: —40 to —80 volts DC @ 1 ma maximum. Less than .5% AC ripple. Filament voltage: 6.3 V AC @ 11 amps; 12.6 V AC @ 5.5 amps. Dimensions: 9" L x 4<sup>3</sup>/<sub>4</sub>" W x 6<sup>1</sup>/<sub>4</sub>" H.

## G Special SSB "Ham" Microphone

IDEAL FOR USE WITH SB-400 OR ANY TRANSMITTER! Special response, 300 to 3,000 cps favors voice frequencies for clear, sharp SSB communications. Mike stand has grip-to-talk switch with lock position. Hi-Z output. Rugged die-cast zinc case. Complete with wiring diagrams for use with any rig. Cables included.

HDP-21, 4 lbs. . . No money down, \$5 mo. . . . . \$29.40



## 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 mc • Gear-drive tuning • Durable epoxy-coated plug-in coils • Coils color-matched to dial scales • Built-in coil storage BATTERY OPERATED, COMPLETELY PORTABLE . . . all solid-state circuit functions as a grid-dip meter or absorption wave meter. One of the handiest instruments a ham can own. Easy to build. Less battery.

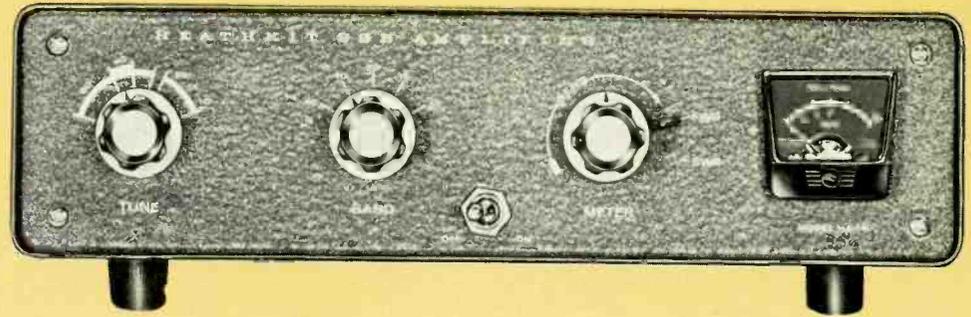
Kit HM-10A, 3 lbs. . . No money down, \$5 mo. . . . . \$34.95

HM-10A SPECIFICATIONS—Frequency range: 3-260 mc. 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. Dimensions: 5<sup>7</sup>/<sub>8</sub>" L x 2<sup>1</sup>/<sub>8</sub>" W x 4<sup>1</sup>/<sub>8</sub>" H (cover included).



# Look To Heath For The Finest

HA-14  
\$99<sup>95</sup>



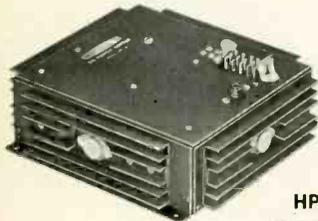
## Heathkit "KW Kompact" . . . World's Smallest Kilowatt SSB Linear Amplifier

- 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 (572-B's or T-160-L's) • Full provision for control of "remotely" located AC or DC power supply.

HERE'S A KILOWATT SSB LINEAR AMPLIFIER THAT SETS NEW STANDARDS FOR SIZE AND PRICE! It can be installed under the dash of nearly every model car with plenty of room to spare—room enough in most cars to allow it to be stacked with your Transceiver, providing a complete under-the-dash mobile kilowatt station. Or picture the KW Kompact on your desk top . . . its ultramodern low profile and handsome styling will swell your pride in owning the world's smallest kw SSB linear. It measures just 3-3/16" H x 12-3/16" W x 10" D! And what's more, the KW Kompact is only \$99.95!

KW KOMPACT GIVES THE PERFORMANCE YOU EXPECT FROM HEATHKIT AMATEUR RADIO EQUIPMENT . . . A kilowatt in a car means real sock for mobile and emergency communications, 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 changeover relay is built-in, and provides "barefoot" operation when the linear is off. Input circuitry is pre-tuned.

## Put A Kilowatt In Your Car! Heathkit HP-14 Mobile Power Supply



HP-14  
\$89<sup>95</sup>

- All solid-state circuitry • Toroidal core transformer • 1500 cps switching frequency • Circuit breaker protection • Includes all interconnecting cables • Remote switching from KW Kompact front panel.

PROVIDES NECESSARY MOBILE POWER FOR KW KOMPACT SSB LINEAR . . . including high voltage and bias. The HP-14 achieves the exceptionally high dynamic regulation ideal for SSB operation through use of a toroidal core transformer and solid-state circuitry operating at a switching frequency of 1500 cps.

INSTALL IT AND FORGET IT! . . . No fuses to replace! . . . Circuit breakers reset automatically. Operates quietly . . . 1500 cps signal is only softly audible. HP-14 is recommended for operation only with 12v. alternator equipped, negative ground cars.

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 cps approx. Dimensions: 8 3/4" W x 7 3/4" L x 2 1/4" D.

A pair of 572-B's or T-160-L's (the two types are equivalent) operate 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. With the appropriate power supply, the KW Kompact operates fixed or mobile, and can be driven by most SSB transmitters in the 100 watt output range. Use one of the Heathkit "Single Banders" for a driver, and get the best value in a high performance mobile rig.

Kit HA-14, 10 lbs. . . No money down, \$10 mo. . . . . \$99.95

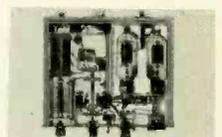
HA-14 SPECIFICATIONS—Band coverage: 80, 40, 20, 15, and 10 meters. Maximum power input: SSB, 1000 watts P.E.P. Driving power required: 100 watts P.E.P. Duty cycle: 50% (SSB voice modulation). Third order distortion: -30 db or better at 1000 watts P.E.P. Output impedance: Fixed 52 ohms unbalanced. SWR 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 VDC at 4 amperes. Cabinet size: 12 3/8" W x 3 3/8" H x 10" D. Net weight: 7 lbs.



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.

## Heathkit HP-24 AC Power Supply For Fixed Operation Of The KW Kompact!



HP-24  
\$49<sup>95</sup>

- 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 NECESSARY FIXED STATION POWER FOR THE KW KOMPACT SSB LINEAR . . . with ripple voltage less than 1% at 500 ma (full peak power) output, and excellent dynamic regulation for the demands of SSB operation. HP-24 requires either 120 or 240 VAC. All connecting cables are included.

OPERATES FROM KW KOMPACT FRONT PANEL CONTROL . . . The HP-24 can be hidden away for convenience, since all necessary controls are available at the front panel of the KW Kompact linear amplifier.

Kit HP-24, 21 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: -180 v. DC with no load; -120 v. DC @ 60 ma. Duty cycle: Continuous @ 40 ma. ALC Threshold voltage: Approximately 6 v. DC. Filament voltage: 12.6 v. AC @ 4 amperes. Power requirements: 120 v., 50-60 cps AC @ 16 amperes (max.); 240 v., 50-60 cps AC @ 8 amperes (max.). Dimensions: 9" L x 4 3/4" W x 6 1/4" H.

# Amateur Radio Equipment



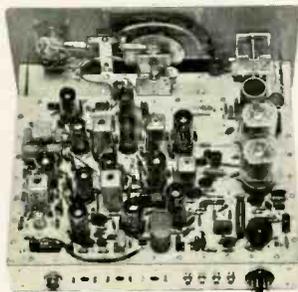
HW-12  
(80-METER)  
**\$119<sup>95</sup>**

## Heathkit "Single-Bander" Transceivers . . . Choose 80, 40 or 20 Meter Models

- Operate SSB on either 80, 40, or 20 meters • 200 watts P.E.P. input • LSB on 80 & 40, USB on 20 • Crystal filter SSB generation • Complete transceiver operation • ALC, AVC, and S-meter • Built-in VOX & push-to-talk circuitry • Stable low frequency VFO • 2 kc dial calibration—6" bandspread—vernier tuning

**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 Compact 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 mc 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 kc selectivity and slow AVC action assure excellent SSB reception. Provision is made for simple plug-in connection of a 100 kc crystal calibrator for accurate band-edge markings.

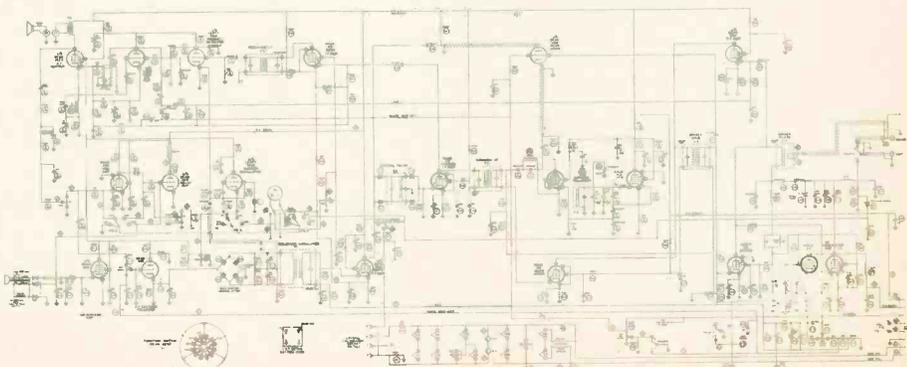


**Sturdy Design—Easy Circuit Board Assembly**  
Over 90% of the components in these units mount on a heavy-duty circuit board for fast, easy assembly and high circuit stability. All three units are compact, lightweight in design, yet sturdily-built to take plenty of hard use. Ideal for either mobile or fixed-station operation.

**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 and page 77). Choose one of these fine-performing units now for versatile all-around "Ham" communications at tremendous savings!

- 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 kc crystal calibrator. . . 1 lb. . . . **\$8.95**

**SPECIFICATIONS—RF input:** 200 watts PEP. **Sideband generation:** Crystal lattice band-pass filter method. **Stability:** 200 cps per hour after warm-up. **Carrier & unwanted sideband suppression:** 45 db. **Frequency coverage:** HW-12, 3.8—4.0 mc; HW-22, 7.2—7.3 mc; HW-32, 14.2—14.35 mc. **Receiver sensitivity:** 1 uv for 15 db (S+N); N ratio. **Receiver selectivity:** 2.7 kc @ 6 db, 6.0 kc @ 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, final bias. **Tube complement:** Fourteen tube heterodyne circuit; (3) 6EA8's mic. amp., VOX relay amp., IF amp., RF amp., Recvr. mixer; (5) 6AU6's, VFO, VOX amp. IF amps., Xmtr. mixer; (1) 6BE6, VFO isolator (HW-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 1/4" W x 10" D.



*You Get Twice As Much For Your Budget With Heathkit*

# Value Specialists in Amateur Radio

## Heathkit "Ham-Scan" Spectrum Monitor

- Adds "sight" to "sounds" of amateur operations • Operates with virtually all receivers in use today • Monitors up to 100 kc of band spectrum—50 kc on either side of the signal to which you are tuned
- Ideal for spotting band openings, checking carrier & sideband suppression, or identifying splattering received signals • Identifies signals as to AM, CW or SSB types • Easy to assemble!

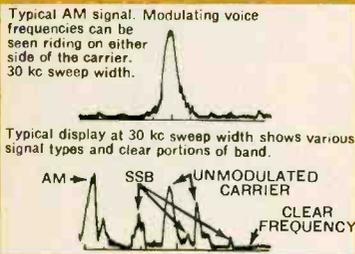


CONTINUOUSLY MONITORS AMATEUR BAND ACTIVITY . . . showing up to 100 kc of band spectrum centered on the frequency to which you are tuned. Eliminates unnecessary "hunting-and-tuning" across the dial to find band openings or areas of maximum activity. All signals within the receiver bandpass and up to 50 kc above or below the frequency to which you are tuned are clearly displayed on the CRT screen as vertical pips. As the receiver is tuned, the display moves horizontally along the baseline with the signal you hear always appearing in the center of the screen.

OPERATES WITH NEARLY ALL RECEIVERS. The Heathkit "Ham-Scan" may be used with receivers with the IF frequencies listed below. Order a "Ham-Scan" for a new dimension in amateur operating.

Kit HO-13, 13 lbs. . . . No money down, \$8 mo. . . . . \$79.00  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**HO-13 SPECIFICATIONS**—Receiver IF: 455, 1600, 1650, 1681, 2075, 2215, 2445, 3000, 3055, 3395 kc. **RF Amplifier**—Response:  $\pm 0.5$  db at  $\pm 50$  kc from receiver IF. **IF**—350 kc. **Sensitivity**: Approx. 50 uv input for 1" vertical deflection at full gain setting. **Horizontal Deflection**—Sweep Generator: Linear sawtooth, recurrent-type (internal). **Frequency**: 10 to 50 cps, variable. **Sweep width**: 30 kc or less, to 100 kc  $\pm 20\%$ , continuously variable. (Approx. 15 kc to 100 kc for 455 kc IF). **Resolution**: 2 kc (frequency difference between two 1" pips whose adjacent 3 db points coincide. Measured at slowest sweep speed and at 30 kc sweep width). **Power supply**: Transformer operated, fused at  $\frac{1}{2}$  ampere. **Low voltage**: Full wave voltage-doubler circuit provides 250 volts @ 20 ma, & 580 volts @ 6 ma. **High voltage**: Half wave circuit provides—1500 volts @ 1 ma for CRT. **Power requirements**: 120 volts AC, 50/60 cps, 40 watts. **Tube complement**: 3RP1 CRT (medium persistence green trace), 1V2 HV rectifier, 6AT6 detector, 6EW6 RF amplifier, 6C10 sweep generator/horizontal amplifier, (2) 6EW6 IF amplifier, 6EA8 oscillator/mixer, (4) 750 ma silicon diode low voltage rectifiers, crystal diode, (1) 1N954 voltage-variable capacitor. **Controls**: On-Off/Intensity, Focus, Horizontal gain, Sweep width, Pip center, Horizontal position, Pip gain, Vertical position, Sweep frequency/AGC, astigmatism. **Dimensions**:  $5\frac{1}{4}$ " H x  $7\frac{3}{8}$ " W x 11" D.



HO-13  
**\$79<sup>00</sup>**

## Heathkit HO-10 Signal Monitor . . . Shows a Continuous Display Of Transmitted And Received Signals

- Shows actual quality of transmitted & received signals • Displays envelope, AF and RF trapezoid patterns • Specially designed for amateur radio use • Automatic switching on transmitted & received envelope patterns • Built-in two-tone test oscillator • 4-position RF level attenuator • Handles power inputs from 5 watts to 1 kilowatt
- Simple to connect in antenna system feed line • Attractive dark-green perforated cabinet with light gray front panel and contrasting dark-green knobs & scope bezel

MAINTAIN A QUALITY SIGNAL! . . . HO-10 shows the quality of the signal you transmit . . . or receive. Distortion, over-modulation, no modulation, non-linearity, and many more effects can be spotted immediately.

SWITCHING FROM TRANSMITTED TO RECEIVED ENVELOPE PATTERNS IS AUTOMATIC. On trapezoid patterns a clamping circuit is employed to pull the spot off-screen during "receive" to prevent burning of CRT screen phosphor . . . switching to received pattern is manual.

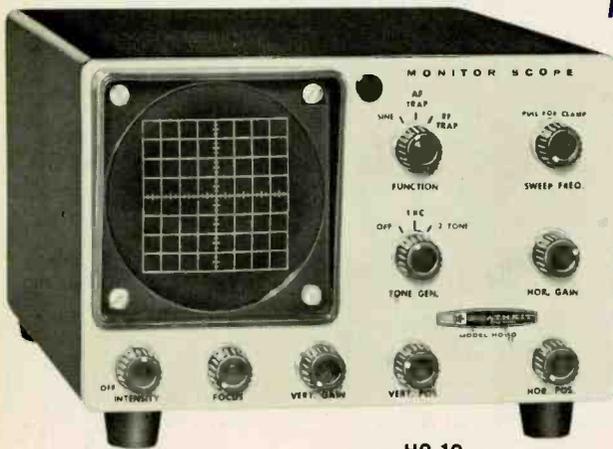
INDEPENDENT OF FREQUENCY. The HO-10 requires no additional tuning when used with transmitters on all amateur bands from 160 through 6 meters, and it operates with all receivers having up to 500 kc IF's.

BUILT-IN TWO-TONE TEST OSCILLATOR. Simplifies transmitter adjustments and testing. When you add the HO-10 to your amateur rig, you will have the finest techniques for signal monitoring at your finger tips.

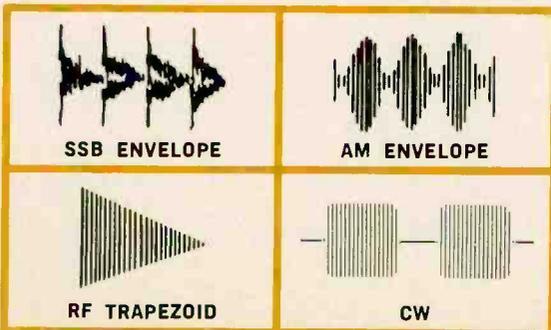
USABLE WITH CB TRANSCEIVERS, TOO! Manual contains special information on using the HO-10 for monitoring the performance of most CB transceivers.

Kit HO-10, 13 lbs. . . . No money down, \$6 mo. . . . . \$59.95  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**HO-10 SPECIFICATIONS**—Vertical response:  $\pm 3$  db from 10 cps to 500 kc. **Sensitivity**: 500 mv per inch deflection. **Input resistance**: 50 k ohm. **Horizontal response**:  $\pm 3$  db from 3 cps to 30 kc. **Sensitivity**: 800 mv per inch deflection. **Input resistance**: 1 megohm. **Sweep generator**: Recurrent type: 15 to 200 cps (variable). **Tone oscillators**: Approximately 1000 cps and 1700 cps. **Output voltage**: 15 mv (nominal). **GENERAL**: Frequency coverage: 160 through 6 meters (50-75 ohm coaxial input). **Power limits**: 5 watts to 1 kilowatt output. **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 6 db per step. **Power supply**: Transformer operated, fused  $\frac{1}{2}$  amp. **Power requirements**: 105-125 VAC, 50/60 cps, 35 watts. **Dimensions**:  $5\frac{1}{4}$ " H x  $7\frac{3}{8}$ " W x 11" D.



HO-10  
**\$59<sup>95</sup>**



# Kits For Nearly Two Decades



## Now! . . . The SB-Series Moves Up To 6 Meters . . . With The Heathkit SB-110 6-Meter SSB Transceiver

- Full SSB-CW transceive 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 kc calibrator and antenna switching • Heath SB Series LMO (Linear Master Oscillator) — provides truly linear tuning • Covers 50-52 mc with crystals supplied—total coverage 49.5-54 mc • One kc dial calibrations — bandspread equal to 10 feet per megacycle • 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

SB-110 PUTS THE FAMOUS HIGH-PERFORMANCE HEATHKIT SB-SERIES ON "6." Now you can operate 6 meters with VOX control . . . have single knob tuning . . . operate "Nets" with transmitter crystal controlled while receiver tuning is variable . . . put out a stable, solid CW signal on "6" . . . or work cross-mode during contests, etc. . . . plus, have the sock of 180 watts PEP SSB! IMPROVED MANUAL TECHNIQUES, CIRCUIT BOARDS, AND WIRING HARNESS SIMPLIFY ASSEMBLY! Kit is divided and packaged in two parts (circuit boards and chassis) and each page of the simple step-by-step instructions is complete with its own two-color pictorial diagram. A VTVM, dummy load, and an AM broadcast receiver are all that is needed for alignment.

DISCOVER THE NEW "FEELING" OF TUNING 6 METERS WITH THE FAMOUS HEATHKIT SB SERIES LMO. That feeling is from the smooth dial mechanism and oscillator stability solid enough to satisfy the rigorous requirements of both CW and SSB operation; plus, truly linear 1 kc dial calibration. The Heath LMO on 6 meters means a maximum drift of less than 100 cps per hour after a 20-minute warmup time; it means dial readings accurate within 400 cps after calibration. Let these performance figures and the specifications below be your guide to choosing the best 6-meter rig available today . . . the SB-110!

Kit SB-110, 23 lbs. . . \$32 dn., \$27 mo. . . . . \$320.00

**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 kc @ 6 db down, 5 kc 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 cps & 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 cps tone. Keying Characteristics: VOX operated from keyed tone using grid-block keying. **GENERAL:** Frequency Coverage: 49.5 to 54.0 mc in 500 kc segments (50.0 to 52.0 mc with crystals supplied). Frequency Selection: Built-in LMO or crystal control. Frequency Stability: Less than 100 cps drift per hour after 20 minutes warmup under normal ambient conditions. Less than 100 cps drift for ±10% supply voltage variations. Modes of Operation: SSB, single sideband (suppressed carrier, with selectable upper or lower sideband). Tune, continuous wave. CW, keyed continuous wave (800 cps offset crystal for cross-mode operation between USB and CW). Dial Accuracy: Electrical, within 400 cps on all band segments, after calibration at nearest 100 kc point. Visual, within 200 cps. Dial Backlash: No more than 50 cps. Calibration: Every 100 kc. Intermediate Frequencies: Receiver First IF & Transmitter Second IF, 8.395 to 8.895 mc passband. Receiver Second IF & Transmitter First IF, 3.395 mc center frequency. Power Requirements: High voltage, +700 v. DC @ 250 ma with 1% max. ripple. Low voltage, +250 v. DC @ 100 ma with .05% max. ripple. Bias voltage, -115 v. DC @ 10 ma with .5% max. ripple. Filament voltage, 12.6 v. AC/DC @ 4.355 amps. Dimensions: 14 1/4" W x 6 3/4" H x 13 3/8" D.



Sectionalized layout on circuit boards simplifies construction—makes components accessible and easy to locate.

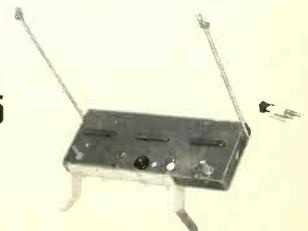
## NEW! Mobile Universal Mounting Bracket For SB-110

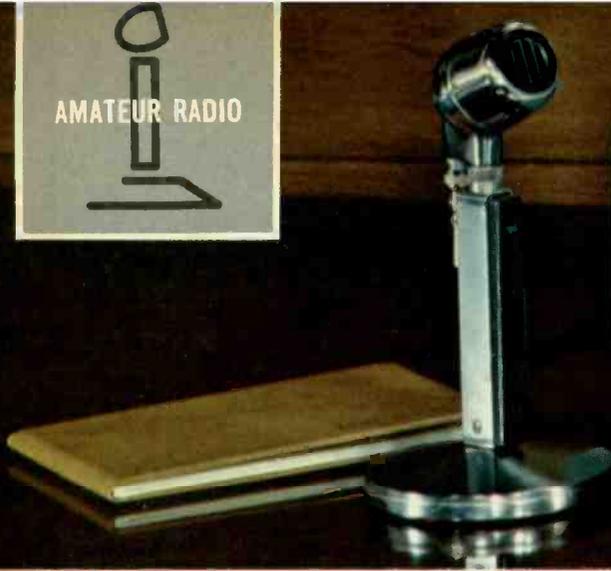
- Permits virtually any-angle mounting of SB-110 • Provides rugged support to handle stress and strain of mobile installation • Includes all necessary electrical connectors and associated wiring for quick-disconnect and plug-in type transceiver mounting

GO SIX-METER SSB MOBILE WITH THE SB-110! SBA-100-1 permits easy installation of SB-110 on transmission hump or under dash. Allows quick plug-in of entire SB-110 in car for easy change from fixed to mobile operation. Supporting rods are concealed behind mounting base when SB-110 is removed. Finish matches SB-110.

Kit SBA-100-1, 6 lbs. . . . . \$14.95

SBA-100-1  
\$14.95





## Heathkit® Deluxe SB-Series Sets The

### Heathkit SB-300 Amateur-Band Receiver \$250

- 80 through 10 meter amateur bands with all crystals furnished, plus provision for VHF converters
- Crystal-controlled front-end for same rate tuning on all bands • 1 kc dial calibrations—100 kc per dial revolution • Bandsread equal to 10 feet per megacycle
- Tuning dial to knob ratio approx. 4-to-1 • Provision for transceive operation with matching SB-400 Transmitter • Prebuilt Linear Master Oscillator (LMO), wiring harness and two heavy-duty circuit boards for fast, easy assembly

**SB-300 GAINS STATURE TO LEAD AMONG THE FINEST!** Experienced amateurs have quickly recognized the high standards to which this receiver is designed. When comparing their SB-300's with other receivers, they describe the crystal-controlled "front-end" that produces optimum stability on all bands; the prebuilt Linear Master Oscillator (LMO) for linear tuning that surpasses nearly every other receiver on the market; the bandsread equivalent to 10 feet per megacycle; the good "solid feeling" of tuning the non-backlash vernier dial mechanism; plus, proven on-the-air performance.

**MANY EXTRAS FOR VERSATILE OPERATION.** Provision is made for VHF converters (power, antenna, & AGC leads) to permit VHF SSB operation. The SB-300 is also ideal for transceive operation with its matching counterpart the SB-400 Transmitter. Use of a common BFO crystal in transceive operation prevents even the most minute frequency difference between transmitter and receiver to assure that the transmitter is "dead-on" the frequency to which the receiver is tuned. Check and compare the specifications and features with those of any other SSB receiver, and see what an outstanding dollar-value the SB-300 represents!

**ORDER YOUR SB-300 NOW!** . . . for unmatched savings, extra value, in a deluxe single-sideband amateur radio communications receiver!

Heath Linear Master Oscillator (LMO) is the heart of the SB-Series tuning. It is factory assembled and sealed to assure years of dependable service.



Kit SB-300, less speaker, 23 lbs. . . No money down, \$23 mo. . . **\$250.00**  
 SBA-300-1 Optional AM crystal filter (3.75 kc), 1 lb. . . . . **\$19.95**  
 SBA-300-2 Optional CW crystal filter (400 cps), 1 lb. . . . . **\$19.95**  
 Export model available for 115/230 VAC, 50-60 cps; write for prices.

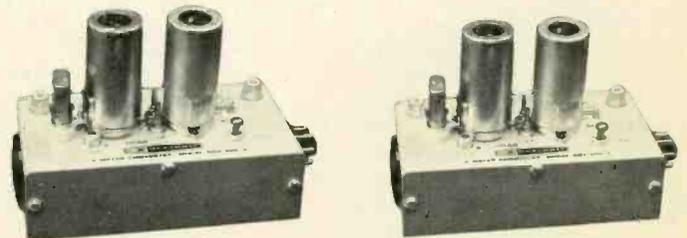
**SB-300 SPECIFICATIONS—**Frequency range (megacycles): 3.5 to 4.0, 7.0 to 7.5, 14.0 to 14.5, 21.0 to 21.5, 28.0 to 28.5, 28.5 to 29.0, 29.0 to 29.5, 29.5 to 30. Intermediate frequency: 3.395 megacycles. Frequency stability: Less than 100 cps per hour after 20 min. warmup under normal ambient conditions. Less than 100 cps for  $\pm 10\%$  line voltage variation. Visual dial accuracy: Within 200 cps on all bands. Electric dial accuracy: Within 400 cps on all bands after calibration at nearest 100 kc point. Backlash: No more than 50 cps. Sensitivity: Less than 1 microvolt for 15 db signal plus noise-to-noise ratio for SSB operation. Modes of operation: Switch selected; LSB, USB, CW, AM. Selectivity: SSB: 2.1 kc at 6 db down, 5.0 kc at 60 db down (crystal filter supplied). AM: 3.75 kc at 6 db down, 10 kc at 60 db down (crystal filter available as accessory). CW: 400 cps at 6 db down, 2.5 kc 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 cps nominal at 6 db. AM: 200 to 3500 cps nominal at 6 db. CW: 800 to 1200 cps 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 kc crystal. Front panel controls: Main tuning dial; function switch; mode switch; AGC switch; band switch; AF gain control; RF gain control; preselector; 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 cps, 50 watts. Dimensions: 14 1/2" W x 6 1/2" H x 13 1/2" D. Net weight: 17 lbs.

### 6 & 2 Meter Plug-In Converters For SB-300

**EXTEND OPERATION OF SB-300 TO VHF!** 6-meter model extends coverage of SB-300 from 48 to 54 mc (50 to 52 mc with crystal supplied); 2-meter extends coverage from 142 to 150 mc (144 to 146 mc using crystal supplied). Uses 6DJ8 cascode amplifier for low noise factor & high sensitivity. Applied AGC provision allows strong signal handling capability. Easy to build and install. Use with any receiver providing appropriate voltages and 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 cps bandwidth; SSB, less than 0.1 uv for 10 db @ 2100 cps bandwidth; CW, less than 0.1 uv for 15 db @ 400 cps bandwidth. Noise figure: 5 db or less. Frequency: Input, 48 to 54 mc (50 to 52 mc with crystal supplied). Output, 28 to 30 mc. Bandsread: Essentially flat over any 2 mc segment from 48 to 54 mc. Image rejection: 50 db or better @ 6 mc. IF rejection: 40 db or better @ 28 mc. Crystal: 22 mc  $\pm 0.005\%$ , 3rd overtone. Tube complement: 6DJ8 cascode RF amplifier, 6EA8 oscillator-mixer. Power requirements: 120 v. @ 12.5 milliamperes, 6.3 v. AC @ 815 milliamperes. Dimensions: Overall, 2 3/4" W x 5 3/4" L x 3 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 cps bandwidth; SSB, less than 0.2 uv for 12 db @ 2100 cps bandwidth; CW, less than 0.2 uv for 20 db @ 400 cps bandwidth. Noise figure: 7 db or less. Frequency: Input, 142 to 150 mc (144 to 146 mc with crystal supplied); output, 28 to 30 mc. Bandsread: Essentially flat over any 2 mc segment from 142 to 150 mc. Image rejection: 80 db or better at 88 mc. IF rejection: 50 db or better at 29 mc. Crystal: 38.67 mc  $\pm 0.003\%$ , 3rd overtone. Tube complement: 6DJ8 cascode RF amplifier, 6EA8 oscillator-triplexer-mixer. Power requirements: 130 V. DC @ 12.5 milliamperes, 6.3 V. AC @ 815 milliamperes. Dimensions: Overall, 2 3/4" W x 5 3/4" L x 3 3/4" H.



# Standards For Amateur Radio



## Heathkit SB-400 Transmitter . . . \$325

- Built-in power supply • Complete transceive capability with SB-300 Receiver • Linear Master Oscillator frequency control • Built-in antenna change-over relay • All crystals supplied for complete 80-10 meter coverage • Automatic level control for higher talk power, minimum distortion • 180 watts PEP SSB, 170 watts CW crystal filter type SSB generation • Operates SSB (upper or lower sideband) & CW • VOX & PTT control in SSB operation, VOX operated CW break-in • Crystal controlled heterodyne oscillators • 1 kc dial calibration—100 kc per dial revolution • Dial bandspread equal to 10 feet per megacycle • 500 kc coverage per bandswitch position • Switched 120 V AC for external antenna relay • Sturdy, lightweight, heavy-gauge aluminum construction throughout • Neat, modern "Low-Boy" styling • Variable loading

**THE PERFECT "MATE" TO THE SB-300.** The Heathkit SB-400 conforms to the same rigid specifications set by the SB-300. An identical LMO controls the stability and tuning rate of the SB-400 . . . it means you get the same outstanding characteristics . . . it means the SB-300 and SB-400 are completely compatible, allowing full transceive operation when they are "mated."

**UNIQUE DESIGN FEATURES.** The SB-400 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.

**BEAUTIFUL STYLING—STURDY CONSTRUCTION.** Neat, modern low-profile styling makes the SB-400 an ideal desk-top transmitter. Cabinet is attractively finished in light gray-green and fully perforated for good ventilation. Cabinet top is hinged for easy access to all inside-top components. Front panel features green "textured" finish with dark green molded dial escutcheon and knobs with spun aluminum inserts. Heavy-gauge aluminum chassis construction provides extra strength without excessive weight for a sturdy, lightweight unit that can be used anywhere.

**EASY TO ASSEMBLE TOO!** Construction proceeds smoothly from start to finish with the complete illustrated instructions furnished. A prebuilt Linear Master Oscillator and crystal SSB filter eliminate critical alignment.

**Kit SB-400, 34 lbs. . . \$33 down, \$28 mo . . . . . \$325.00**  
 Export model available for 115/230 VAC, 50-60 cps; write for prices.  
**HDP-21** (Special SSB "Ham" Microphone—see pg. 77 for details). . . 4 lbs. . . No money down, \$5 mo. . . . . **\$29.40**

**SB-400 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:** (mc) 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 cps per hr. after 20 min. warmup. **Carrier suppression:** 55 db below peak output. **Unwanted sideband suppression:** 55 db @ 1 kc. **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 cps. **ALC characteristics:** 10 db or greater @ 0.2 ma final grid current. **Noise level:** 40 db below rated carrier. **Visual dial accuracy:** Within 200 cps (all bands). **Electrical dial accuracy:** Within 400 cps after calibration at nearest 100 kc point (all bands). **Backlash:** Less than 50 cps. **Oscillator feedthrough or mixer products:** 55 db below rated output (except 3910 kc 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 cps  $\pm$  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 KW SSB Linear . . . \$200

- 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

**TO COMPLETE YOUR SB-SERIES 80-10 METER AMATEUR STATION . . .** here in a single compact unit is a completely self-contained desk-top linear amplifier that provides up to 1200 watts P.E.P. input SSB, 1000 watts CW in a high efficiency grounded-grid circuit for improved amateur communications.

**LATEST DESIGN FEATURES.** You'll find many advanced-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.

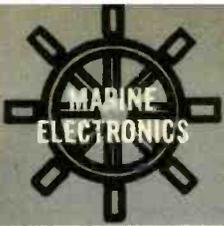
**IT'S EASY TO GO HIGH POWER . . .** when you choose the SB-200. Order yours today!

**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.



# Heath-Built Deluxe High-Performance



MWW-15  
**\$425.00**  
(less remote)



MWW-14  
**\$279.95**



# Marine Radiotelephones

## Heath-Built 150 Watt Marine Radiotelephone Now With Full Remote Control Option

- 150 watt power input • 8 crystal-controlled transmit & receive channels • Covers 2-3 and 4-5 mc 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 extra sensitivity & long range—ceramic Transfilters® for extra selectivity • 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

HERE'S THE RADIOTELEPHONE THAT SETS NEW STANDARDS IN 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! Receiver monitoring requires only 0.6 amperes, yet this sensitive receiver provides complete communications facilities as well as AM broadcast band tuning . . . compare them! . . . variable squelch control & automatic noise limiting; Transfilters® to minimize interference; provisions for remote monitoring 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.

NEVER BEFORE HAVE BOAT OWNERS BEEN OFFERED SUCH A DURABLE, HANDSOME PIECE OF ELECTRONIC EQUIPMENT . . . picture the MWW-15 on the bridge of your boat, or next to the chart table. The cabinet is aluminum, and is styled in black, white, and gray with sea blue accents. Your MWW-15 can be installed in any convenient position. Heath has styled it for your pride of ownership . . . and it will keep its smart appearance for years.

WHEN YOU CHOOSE A HEATH RADIOTELEPHONE, YOUR SATISFACTION IS ASSURED . . . the owner's manual is complete in virtually every respect. Installation is discussed completely and thoroughly. You can install this radiotelephone yourself! What's more, all necessary FCC regulations, license information, and forms are included. Crystals for 2182 & 2638 are even included. All you must do is have the final tune-up made by a 1st or 2nd class licensed technician.

- Assembled MWW-15, 31 lbs. . . \$43 dn., as low as \$25 mo. . . . \$425.00
- Assembled MWW-15R 150 watt 'phone plus remote control . . . write for credit details . . . \$520.00
- Assembled MWA-15-1 Radiophone remote control unit, 8 lbs. . . No money down, \$10 mo. . . \$95.00
- 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 mc. Broadcast, 540-1620 kc. 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:** (2) 2N1526 R.F. Amplifier & Mixer; (3) 2N1525 Marine Crystal Oscillator, 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 marine bands. RF Input: 150 watts. RF Output: 80 watts. **Transmitter tube complement:** (1) 12BY7 Colpitts Oscillator; (1) 6HF5 Power Amplifier. **Power requirements:** 12 volts DC. Receiver only, 0.6 amp. Standby, 2.9 amp. Transmit, 20 amps. **Dimensions:** 6½" H x 11¼" W x 17" D.

## Heath-Built Deluxe 75-Watt Radiotelephone

- 75 watt power input • Crystal-controlled transmit & receive channels • Covers 2-5 mc marine band and standard AM broadcast • 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

JUST AN ARM'S LENGTH AWAY FROM HELP! The MWW-14's power-packed 75 watts provides priceless peace-of-mind when venturing far from home. And it keeps you posted on latest weather reports, as well as entertaining the crew with popular AM radio!

**SOLID-STATE CIRCUITRY ASSURES LONG LIFE.** The all-transistor receiver has a new R.F. stage for greater sensitivity, plus modern ceramic Transfilters® that never need alignment and provide increased selectivity. There are provisions for remote monitoring, and 15 watts of audio for deck hailing. The heavy-duty power supply is also transistorized for long life—no rectifier tube or vibrator to fail. An adjustable squelch control and automatic noise limiter quiet background noise during standby. Plus, received signal strength and transmitter power output are indicated by the illuminated panel meter.

**CIRCUIT BREAKER PROTECTION ENDS FUSE REPLACEMENT!** Covered relays protect against dirt and dust, and all circuitry is moisture protected.

**COMPLETE AND READY FOR INSTALLATION.** Includes push-to-talk microphone, crystals for 2182 & 2638 kc, and complete license information, installation and operating instructions, and FCC forms. Easy to install! Must be tuned by a licensed technician.

- Assembled MWW-14, 31 lbs. . . No money down, \$26 mo. . . . \$279.95
- MWA-14-1 Telephone-type hand set. . . 2 lbs. . . No money down, \$5 mo. . . . \$24.95
- Extra transmit & receive crystals (specify), 1 lb. . . . each \$2.95

**MWW-14 SPECIFICATIONS—RECEIVER:** Frequency Range: Marine, 2-5 mc. Broadcast, 540-1620 kc. 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:** (2) 2N1526 RF amplifier & mixer; (3) 2N1525 Marine crystal oscillator, 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 mc 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.



New! Full Remote Control  
For The MWW-15



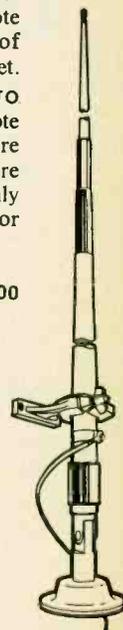
ENJOY THE CONVENIENCE AND ADDED SAFETY OF COMPLETE REMOTE CONTROL OPERATION . . . offering on-off control, the entire selection of 8 marine channels, and volume & squelch control from the remote control center. Includes: 25' of cable, prewired connectors; handset. **ULTRA-COMPACT, YET STYLED TO MATCH THE MWW-15 . . .** the remote control unit can be installed where space is a premium. Dimensions are 5" H x 9" W x 5" D. Requires only 6" H x 10½" W x 5" D space for installation.

Assembled MWA-15-1, 8 lbs. . .  
No money down, \$10 mo. . . \$95.00

### 24' Marine Antenna

Ideal for use with the Heath-Built MWW-15 radiophone. Assures long operating range. Husky, 2-section fiberglass. Bottom section 13' long, 1½" dia., contains loading coil. Top section 11' whip. Chrome-plated brass studs. Complete with lay-down swivel base & rugged side mount. Ready to install.

MDP-74, 14 lbs. . .  
No money down, \$7 mo. . . \$69.95



### University Deck Speaker

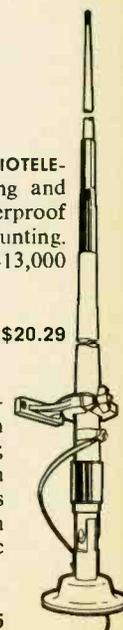
IDEAL FOR USE WITH HEATH RADIOTELEPHONES . . . for deck monitoring and hailing. Horn projector is weatherproof and has "any-angle" swivel mounting. Specs: 25 watts, 8 ohms, 200-13,000 cps, color—gray.

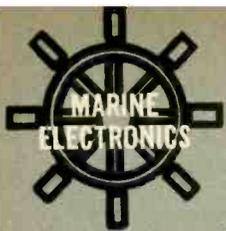
Model MDP-104, 7 lbs. . .  
mfrs. list \$34.50 . . . Net \$20.29

### 18' Radiophone Antenna

Husky, 2-section, fiberglass antenna! Covers 2-3 mc. 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. . .  
No money down, \$6 mo. . . \$59.95





# More Safety & Fun Afloat...

**Heath-Built 25-Watt Radiotelephone . . .**  
**Ideal For Sailboats And Inboard Or**  
**Outboard Power Craft**  
**With Medium Cruising Range**

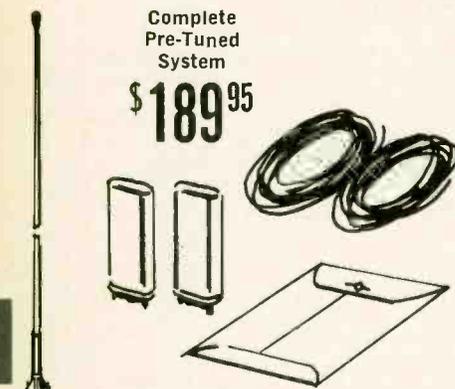


• Choose complete system for owner installation on outboards or separate unit for installation on any boat with technician checkout • 4 crystal-controlled transmit & receive channels • Covers 2-3 mc marine & standard AM bands • 10-transistor, 5-diode, 3-tube circuit • Built-in heavy-duty transistor power supply • FCC type accepted • Compact, factory assembled & ready to install

Complete  
Pre-Tuned  
System

**\$189<sup>95</sup>**

RADIOPHONE  
**\$164<sup>95</sup>**



**Complete Package MWW-13AS For Do-It-Yourself Outboard Installation!** Includes 25-watt Radiophone; gimbal mounting bracket; 13' antenna (MDP-93); antenna, ground & power cables; crystals for 2 channels; push-to-talk microphone; FCC license pack & complete instructions!

### 13' Radiophone Antenna

Sturdily-built fiberglass . . . ideal for use with MWW-13A! Covers 2-3 mc band. Features chrome plated studs and high-impact plastic side mounts. Bottom section 7' long, 1" in dia. and contains loading coil. Top section 6' whip. Swivel base optional.

MDP-93, Antenna only, 5 lbs.  
No money down, \$5 mo. . . . . **\$34.95**  
MDP-103, Swivel lay-down base mt., 2 lbs. . . . . **\$9.95**

**GO AHEAD . . . SET THAT COURSE FOR A CRUISE!** Take off on those longer jaunts with a new sense of confidence. The confidence that comes from the knowledge that your reliable MWW-13A is ready to put you in instant contact with the Coast Guard, other ships or the phone company should the need for help arise. Keeps you abreast of the latest weather reports, and entertains with AM radio!

**OPERATING RANGE UP TO 25 MILES!** Features a powerful 25-watt transmitter, dependable 8-transistor receiver, heavy-duty power supply, 4 crystal-controlled channels, circuit breaker protection (no fuses to replace), and a handsome black and white rust-resistant aluminum cabinet. **OUTBOARD MARINERS . . . INSTALL IT YOURSELF FOR EXTRA SAVINGS!** Choose the pretuned MWW-13AS system, and use the motor as the ground system . . . antenna and all accessories included! Inboard and sailboat owners can purchase the MWW-13A radiophone separately for use with any good ground such as the Heathkit MD-14 on page 88.

Both versions include 2182 and 2638 kc transmit and receive crystal (ship-to-shore and distress channels). Move out to greater cruising distances this season with the added safety, savings—including lower insurance rates—and convenience of a Heath-Built 25-watt radiophone!

Assembled MWW-13AS, Complete system for do-it-yourself installation on outboard powered boats, includes radiophone, antenna & instructions, 22 lbs. . . 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**

Extra transmit & receive crystals (specify) 1 lb. . . . . each **\$2.95**

**MWW-13A SPECIFICATIONS**—Frequency range: 2-3 mc. Broadcast: 550-1600 kc. 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.

## Heathkit Fog Horn/Hailer/Boat Horn

• 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!** . . . projects your voice up to several hundred yards. Excellent for docking, fueling, and hailing other boats. Just use push-to-talk microphone.

**USE IT AS A BOAT HORN!** . . . Just push the panel-mounted horn button to warn other craft, and signal for bridge openings.

**RELIABLE PERFORMANCE . . . EASY TO INSTALL!** . . . powerful all-transistor circuitry assures dependable performance at all times. Runs cool with no component deterioration as with tube-type units.

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

**MD-24 SPECIFICATIONS**—Output power: 30 watts peak. 20 watts continuous. Fog horn sequence: 6 second 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 3/8" H x 6 1/2" W x 6" D. Color styling: White, gray & black. Cabinet: Aluminum.

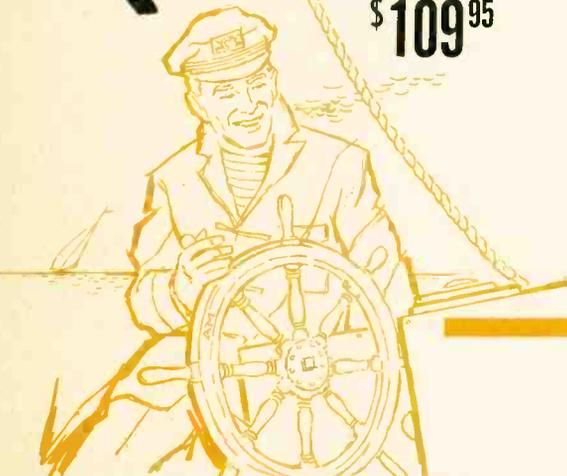


MD-24  
**\$79<sup>95</sup>**





MR-21A  
\$109.95



## For Safe, Sure, All-Weather Navigation . . . Heathkit "Mariner" 3-Band Radio Direction Finder

- Covers Beacon/Consolan, AM, & Marine telephone bands • All-transistor circuitry for dependability, & long life • Independent built-in battery power supply • Simple to build . . . complete with factory built & aligned "front-end" tuner & prewired component package

**CRUISE WITH SAFETY.** Your "Mariner" is always ready to show you exactly where you are . . . provide you with weather bulletins . . . and double as a communication receiver in emergencies. Power is self-contained—dependent of boat's power plant for extra safety.

**CRUISE RELAXED—NAVIGATE BY RADIO.** Your "Mariner" and your compass are your two most valuable navigation instruments . . . a must for cruising! All three extra-sensitive bands of the MR-21A provide longer range, and better performance. The automatic gain control offers a deeper null for easier, more accurate bearing measurements. Position bearings are easily read on the 6½" compass rose located beneath the rotary loop antenna.

**RESOLVE THE PROBLEM OF THE DOUBLE NULL.** The "Mariner's" sense circuitry gives true directions by resolving the problem of double null common in many other RDF's. Sensitivity control increases accuracy of the "tune-null" tuning meter . . . large slide-rule dial makes station selection easy, and for added convenience during nighttime use, dial and meter are lighted through spring-return switch.

**ENJOY OFF-SHORE CRUISING.** Your "Mariner" will keep you in constant touch with the mainland via AM radio . . . entertain you and your crew on long voyages and at those isolated anchorages.

**ADD THIS ATTRACTIVE UNIT TO YOUR BOAT.** The rust-resistant metal cabinet is "marine" styled in black, white, gray & blue . . . makes a handsome addition to any boat. Easy to build! . . . the "Mariner" goes together easily with a pre-wired component package and preassembled, prealigned tuner. Components lay out in real Bristol fashion for easy building. Order yours today!

Kit MR-21A, 14 lbs. . . No money down, \$11 mo. . . . . \$109.95

**MR-21A SPECIFICATIONS**—Beacon band: 188 to 410 kc. Broadcast band: 535 to 1620 kc. Marine band: 1650 to 3450 kc. Sensitivity for 6 DB signal-to-noise ratio: BC band, 40 uv/meter; Beacon band, 120 uv/meter; Marine band, 25 uv/meter. Normal bearing accuracy: ±3°. BFO: 455 kc, switch-selected. Speaker: 4" x 6" weatherproofed. Power requirements: 9 volts from 6 standard size "D" flashlight batteries. Battery drain: 90 ma @ 350 mw max. output level. Battery life: 500-1000 hours. Dial light: Spring-return switch operated. Null & Tuning indicator: 0-1 ma meter. Transistors: (1) 2N409 Sense amplifier; (1) T1363 RF amp.; (1) 4JX-1D925 Oscillator; (1) 2N1526 mixer; (5) 2N1274 AGC amp., audio amp., audio output, & BFO oscillator; (2) T1364 1st & 2nd I.F.; (1) crystal diode detector. Dimensions: 10" H x 10" W x 8½" D, including base and loop.

## When You Can't Afford To Guess . . . Choose The Heathkit Depth Sounder

- Greater depth reaching ability—down to 200' 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

**PROTECTS YOUR BOAT.** Often wondered about the depth of your sailing water and worried about running aground? There's no need to if your boat is equipped with an 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.

**A VALUABLE AID.** Locates schools of fish and indicates type of marine terrain by quality of return echo. Provides an extra navigational reference.

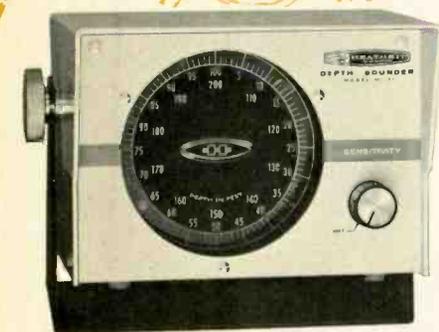
**COMPARE THESE FEATURES WITH OTHER, MORE COSTLY UNITS!** An all-transistor circuit puts your MI-11A in operation instantly . . . keeps it operating faithfully, accurately. Large black shaded dial with big white numerals reads easily. Attractive rustproof metal cabinet has nautical gray, white, black & blue color styling. A gimbal mounting bracket permits installation virtually anywhere!

**2-WAY POWER SUPPLY OFFERS ADDED VERSATILITY!** A new rear-panel mounted internal-external battery switch permits easy selection of either self-contained or boat battery operation. For simple connection to the boat's 12v. battery, a new power plug is mounted on the rear panel . . . save sounder's 9 standard "C" flashlight batteries (not included) for emergency use! Also included is a waterproof transducer that installs through the hull or outboard with accessory transducer mount (optional). Ignition interference is reduced with improved cable shielding.

**ASSEMBLES IN JUST 4 TO 6 HOURS** with stable, fiberglass circuit board construction . . . takes no special skills or knowledge. Order now!

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 kc. 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 enclosed 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: 7½" W x 5¼" H x 7½" D.



MI-11A  
\$69.95



MIA-11  
\$8.95





# Marine Accessories For Convenience & Safety!



**A**  
MI-41  
\$39.95



## **A Fuel Vapor Detector . . .**

### **A Safety "Must" On Any Power Craft!**

- Detects combustible gas fumes • Provides visual warning or may be connected to operate alarm or ventilator-blower • Transistorized for dependability—self-testing for foolproof safety • Simple to build & install

**BETTER THAN AN INSURANCE POLICY!** Protects against fire and explosion hazards due to undetected fumes in engine compartment. Multi-colored "Safe-Dangerous-Explosive" meter scale indicates condition *before* starter button is pressed. All-transistor circuit unaffected by drafts, temp. or volt. variations. Self-testing for "fail-safe" operation. Operates on 12 v. DC pos. or neg. ground.

Kit MI-41, 4 lbs. . . No money down, \$5 mo. . . . . \$39.95

**MI-41 SPECIFICATIONS**—Voltage: 12 V DC. Current: 1.0 amp. Panel size: 5" x 3-7/16". Depth: 3 3/4". Detector head size: 1 1/2" round x 2 1/2" long. Length of interconnecting cable supplied: 15'. Audible alarm capability: Yes. Meter indicator: Yes. Color: Marine White & Black. Material: Aluminum. Temp. range: —20° C to +80° C.



Kit Form  
or  
Factory  
Assembled

**B**  
KIT  
\$29.95  
WIRED  
\$39.95

## **B Heathkit Power Converter . . .**

### **Provides Shore-Side Power Afloat!**

- 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 CONVENIENT ACCESSORY FOR BOAT, TRAILER, CAR!** 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 cycle AC; 12 volt operation, 175 watts continuous, 240 watts max.; 6 volt operation, 120 watts continuous and max. Input current for continuous ratings: 6 volt operation, 25 amperes, 12 volt operation, 16.5 amperes.



**C**  
MI-31A  
\$24.95

## **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

**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. Pos. and neg. ground.

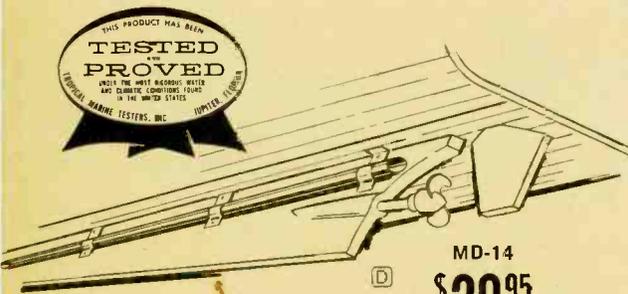
Kit MI-31A, 3 lbs. . . No money down, \$5 mo. . . . . \$24.95

## **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

**MORE THAN ADEQUATE FOR MOST BOAT ELECTRICAL SYSTEMS!** Two 8' heavy-gauge copper tubes, tapered at ends, minimize water resistance, require only bolting thru keel (min. length 9', max. thick. 5") and 1 thru-hull fitting. Does not affect balance, steering or maneuverability of craft. Corrosion-proof. Won't catch on rocks, logs, etc. Improves operating range of your radiotelephone.

Kit MD-14, 20 lbs. (Motor freight or Express only), No money down, \$5 mo. . . \$29.95



**D**  
MD-14  
\$29.95



**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.

# Top-Quality Shortwave Radios!



## Enjoy Shortwave Listening Anywhere With A Deluxe "Mohican" Portable Receiver!

- Powerful 10 transistor, 6 diode circuit for instant, long dependable performance
- Tunes 550 kc to 32 mc in five bands—AM and 4 shortwave
- Fixed alignment ceramic IF "transfilters®" for best selectivity
- Completely self-contained battery power supply for portability, yet can operate on 117 v. AC household current with XP-2 accessory @ \$9.95
- 2-tone green metal cabinet

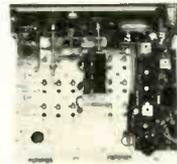
**RUGGED, COMPACT, READY TO GO ANYWHERE!** Beach, ball game, picnic, boating, camping . . . wherever your travels take you! Ready to circle the globe at the spin of a dial to bring you broadcasts from Spain, Germany, South America, countless foreign country shortwave stations . . . amateur radio operators . . . marine and weather stations . . . and popular AM radio!

**DELUXE FEATURES INSURE HIGHEST PERFORMANCE!** For example, the fixed-aligned ceramic IF "transfilters®", developed for military use, shape the IF bandpass for excellent stability and selectivity . . . Zener diode voltage regulation . . . smooth, accurate, flywheel tuning . . . panel tuning meter and large, slide-rule dial for precision station selection . . . built-in 4" x 6" speaker for clear, crisp tone . . . and a headphone jack for private listening. Complete panel controls offer finger-tip operating convenience . . . on/off volume control, BFO pitch with on/off switch, RF gain, antenna tuning, electrical bandspread (oscillator tuning), ANL on/off, AVC on/off, and bandswitch.

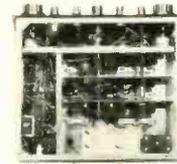
**ATTRACTIVE STYLING!** One-piece 2-tone green metal cabinet . . . rugged enough to withstand rough handling. Also operates on house current with XP-2 Power Supply accessory (below). Assembles in around 30 hours. Batteries not included. Requires RF generator for final alignment.

**Kit GC-1A**, 18 lbs. . . No money down, \$9 mo. . . . . **\$89.50**  
**Kit XP-2** . . . 117 V AC plug-in power supply, 2 lbs. . . . . **\$9.95**

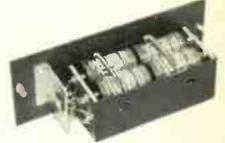
**GC-1A SPECIFICATIONS**—IF Frequency: 455 kc. Frequency coverage: 550 kc to 32 mc in 5 bands with calibrated bandspread scales (oscillator tuning) for 80, 40, 20, 15 and 10 meter amateur bands and 11 meter citizens band. Selectivity: 3 kc wide at 6 db down. Sensitivity: 10 uv broadcast band, 2 uv shortwave 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.



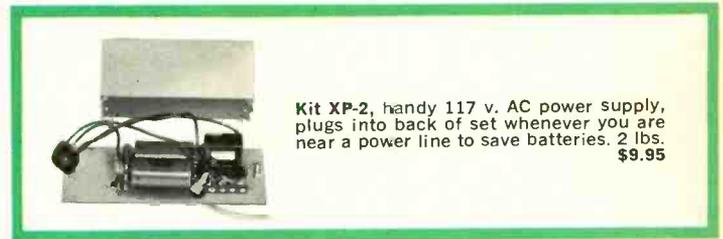
**10 TRANSISTORS, 6 DIODES** . . . no hybrid circuits here, this world-circling receiver has an all semi-conductor circuit.



**CERAMIC IF "TRANSFILTERS®"** developed for military use, shape bandpass, offer superior selectivity, never need alignment.



**BATTERY POWERED FOR PORTABILITY** . . . Uses 8 standard flash-light batteries to make it independent of power lines; use it anywhere . . . it works everywhere.



**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**

## Heathkit "Beginner's" Shortwave Radio . . . Simple To Build . . . Fun To Operate . . . Easy To Own!

- Covers 140 kc to 18 mc 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 kc to 18 mc 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! Choose the GR-81!

**Kit GR-81**, 12 lbs. . . . . **\$23.50**

**GR-81**  
**\$23.50**



**GR-81 SPECIFICATIONS**—Frequency coverage: 140 kc to 18 mc on four bands. Tube complement: 12A7 Detector/1st Audio, 50C5 Audio Output, 35W4 Rectifier. Power requirements: 105-125 V 50/60 cycle 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.



## The World At Your Fingertips . . .

**Deluxe SWL Radio Compares To Sets Costing \$150 & More . . . Costs 40% Less!**

- 5 bands . . . 3 shortwave bands cover 2 mc to 30 mc, plus 550 kc to 1550 kc AM broadcast band, & 180 kc to 420 kc 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 band-spread 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

**DELUXE FEATURES USUALLY FOUND ONLY ON MORE EXPENSIVE UNITS!** Like the tuned RF stage that provides added amplification and image rejection. And a half-lattice crystal filter for truly sharp selectivity . . . you won't find this feature on any unit selling for under \$150! If you're a seasoned SWL, you'll appreciate the diode detector for AM, plus a separate product detector for efficient SSB & 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 & error" SSB tuning. And for a new adventure in listening, try the aeronautical weather broadcasts on the extra 180 kc to 420 kc band.

If you have ambitions towards ham radio, you can 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.

**COMPLETE CONTROLS FOR FULL COMMAND OF ALL FUNCTIONS!** There are separate level controls for audio volume & R.F. 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 eliminate blasting or fading while tuning.

**HOW CAN WE OFFER THIS SUPERB UNIT AT AN UNMATCHED LOW PRICE?** Typical Heath Engineering, of course. But we've gone a step further to add extra savings. With the GR-54, you build & align the front-end tuner . . . with or without instruments . . . and get factory-built results! Thanks to a unique printed circuit bandswitch assembly, you simply align the coils with the alignment tool provided, and use the signal strength meter for adjustment readings. The entire GR-54 construction time is around 12 to 15 hours.

As for looks, judge for yourself. Wouldn't it make an attractive addition to your den or living room?

**Kit GR-54, 24 lbs. No money dn., \$9 mo. \$84.95**

**GR-54 SPECIFICATIONS**—Frequency coverage: Band A 180 kc to 420 kc; Band B 550 kc to 1550 kc; Band C 2 mc to 5 mc; Band D 5 mc to 12.5 mc; Band E 12.5 mc to 30 mc. Selectivity: Half lattice crystal filter; 3 kc minimum at -6 db; 8 kc maximum at -20 db. Intermediate frequency: 1682 kc. Antenna input impedance: 50 ohms nominal—phono connector. Power requirements: 120 volts, 50/60 cps AC, 45 watts. Tube & diode complement: 6BH6 RF amplifier, 6EAB oscillator and mixer; (2) 6BA6 IF amplifier; 12AT7 BFO and product detector; 6HF8 audio preamplifier and power amplifier; 2 semi-conductor diodes—AVC rectifier; 2 semi-conductor diodes—AM detector; 2 semi-conductor diodes—ANY; 2 semi-conductor diodes—power supply rectifiers. 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 1/2" W x 6-5/16" H x 10-15/16" D.

**FREE!** GRA-72 SWL Antenna (described on opposite page) included!

Tuned RF Stage Included in unique printed circuit band-switch assembly. Provides added amplification & image rejection for greater sensitivity.



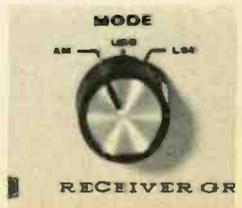
Half Lattice Crystal Filter . . . gives you extra sharp selectivity. You won't find this feature on any unit selling for under \$150.



Separate Product Detector . . . for efficient SSB & CW reception. For AM, there's a diode detector.



Switchable BFO Control . . . Simply switch to the USB or LSB position, and adjust the bandspread tuning control . . . eliminates "trial & error" SSB tuning.





# With A Heathkit® Shortwave Radio!



**Venture Into The Exciting World Of Shortwave With This Low Cost Heathkit Receiver!**

- 4 bands—3 shortwave bands cover 1 mc to 30 mc, plus 550 kc to 1620 kc 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

**AROUND THE WORLD AT THE TWIRL OF A DIAL!** Imagine hearing a radio operator at a weather station in the Antarctic report: *"It's 40° below zero this morning"* . . . thrill to the somber tones of Big Ben from London . . . or wonder at the machine gun pace of a CW operator sending an urgent code message. This is just a fraction of the exciting listening that's yours with the GR-64. Hear live broadcasts from Japan, Australia, Peru, Holland, Brazil, the Congo, dozens 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, & weather reports. Even get the exact time from government station WWV in Washington, D.C. And, of course, enjoy your favorite programs on popular AM radio.

You hear it all . . . and much more . . . all on this single general coverage receiver!

**ADVANCED FEATURES INSURE SHARPER RECEPTION, GREATER OPERATING CONVENIENCE!** A high voltage, transformer-operated power sup-

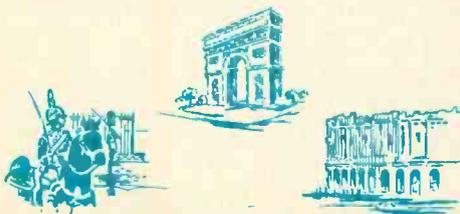
ply insures peak receiver efficiency. A BFO control "unscrambles" code and SSB transmissions. A "velvet-touch" 16 revolution tuning knob provides smooth, accurate station selection. And electrical bandspread tuning provides maximum station separation. There's even a headphone jack for private listening.

The back panel has terminals for an external antenna, a Q-multiplier input, and a noise limiter on/off switch.

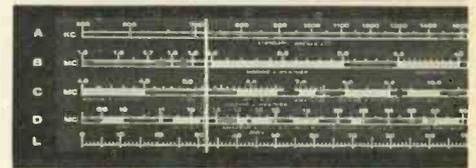
**MODERN "LOW-BOY" STYLING!** Its charcoal gray metal cabinet with black front panel and green & white band markings makes a handsome addition to any room. And with easy circuit board construction, assembly takes only about 8 fun-filled hours.

Kit GR-64, 15 lbs.  
No money down, \$5 mo. . . . . \$37.95

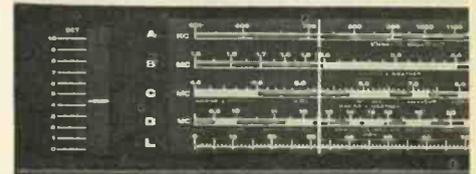
**GR-64 SPECIFICATIONS**—Frequency range: 550 kc to 30 mc in four bands. Controls: General coverage tuning, Bandspread tuning, Bandswitch, Noise Limiter—ON/OFF, Phone-Standby-CW switch, BFO control, Audio Gain, AC-ON/OFF, Headphone jack, Q-multiplier input. Power requirements: 105-125 V 50/60 cycles AC, 30 watts. Dimensions: 13½" W x 6" H x 9" D.



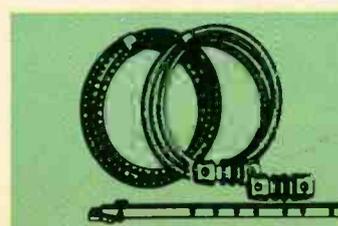
**New High Voltage, Transformer-Operated Power Supply.** Provides peak receiver efficiency, safe "shock-free" operation.



**Big 7-Inch Tuning Dial.** Covers 550 kc to 30 mc in four bands with Shortwave & Amateur Bands clearly marked plus an extra "logging" scale.



**New Bandspread Tuning Bar.** Lighted dial for easier, faster bandspread reading.



### Shortwave Antenna Kit

Consists of 75 ft. long-wire antenna, 30 ft. lead-in wire, porcelain insulators and grounding hardware with complete instructions. Ideal for use with Heathkit GR-54, GR-64 & GR-81 shortwave receivers. GRA-72, 2 lbs. . . . . \$1.45



# For Better Road Performance & Economy

## Diagnose Ignition Troubles With This Easy-To-Use Heathkit® Analyzer!

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

**BECOME AN IGNITION EXPERT!** Whether you work with automobiles for a living or for relaxation, you'll find the IO-20 Ignition Analyzer a productive and fascinating accessory. With it, you can quickly identify 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 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, easily . . . 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. For fast, easy tune-ups and ignition system trouble-shooting, order your IO-20 now!

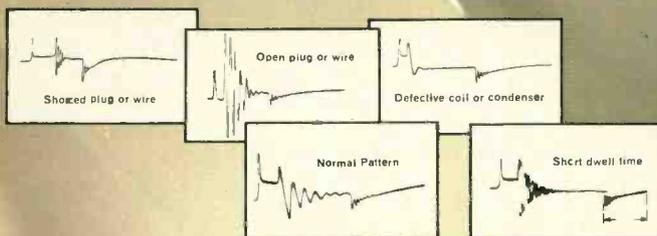
**Kit IO-20, 17 lbs. . . No money down, \$9 mo. . . \$89.95**  
Export model available for 115/230 VAC, 50-60 cps; write for prices.

**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 cycles AC, 30 watts.



IO-20  
**\$89.95**

Tell-tale Patterns Show Ignition System Condition



### For Engine Tune-Up & Repair Choose 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. Orders yours now!

GFP-83, 4 lbs. . . . . \$11.95



GFP-83,  
**\$11.95**



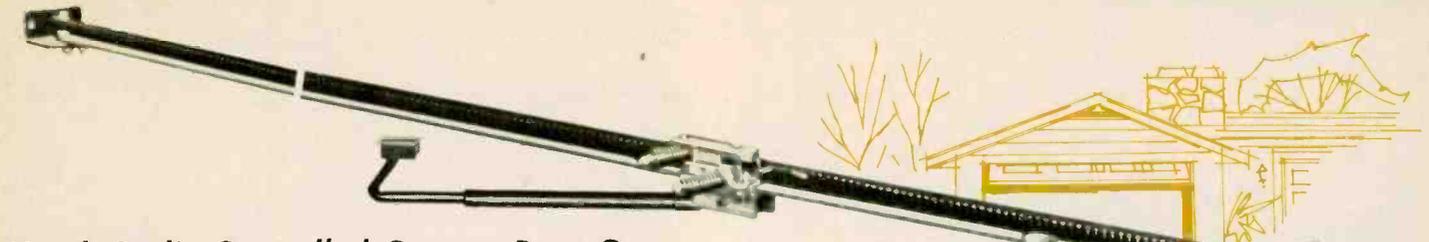
ID-11  
**\$14.95**

### Low-Cost Timing Light . . . 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

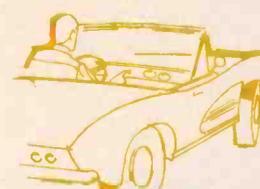
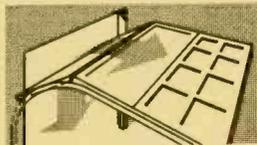
# ...Choose Heathkit® Auto Accessories!



## Heath Radio-Controlled Garage Door Opener ... Push Button Convenience Saves Time & Labor! Easy-to-Build 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 2½" clearance above highest point of door travel.



Kit Form Mechanism



Assembled Transmitter & Receiver

GD-20A  
**\$124<sup>90</sup>**

- New VHF portable "wireless" transistorized 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—less 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

JUST A TOUCH OF A BUTTON on the new "wireless" transmitter as you pull into your driveway is all it takes to open your garage, and turn on the light! Another touch of the button once you're safely inside, and the garage door closes automatically, securely! No more straining & 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 & back when it's cold, raining or snowing! Especially convenient for Mom and elder family members! And 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!

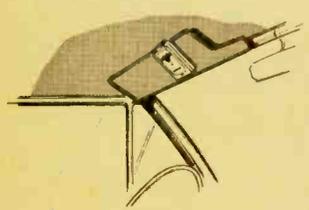
NEW FACTORY ASSEMBLED VHF ELECTRONICS provide greater operating range, better performance. The new "pocket-size" transistorized transmitter offers portable convenience... simply clip to car's sun visor or slip into your pocket or purse. And since it's "wireless" there's no complicated or cumbersome permanent mounting under the hood or dash... makes it easy to move from car to car! Operates on self-contained battery power to eliminate any drain on car's battery.

And the new sensitive superregenerative receiver with RF stage takes just a few minutes to install in your garage. Both transmitter & receiver are completely assembled and pre-tuned at the factory. And no license is required... system is designed for use on 230 to 290 megacycles... selectable tone coding prevents interference with nearby units.

A UNIQUE SAFETY DEVICE ON THE MECHANISM releases the door automatically when obstructed. Release pressure is adjustable from 0 to 100 lbs. in both "up" and "down" directions. The mechanism is quick and easy to assemble, and may also be purchased separately for operation from house or garage. A spring-loaded connecting arm assures a tight weather seal... keeps out rain & snow! The automatic light features may be extended to control driveway, patio, breezeway lights, etc.

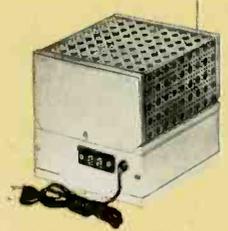
Start enjoying the convenience, and labor-saving ease of a Heathkit Garage Door Opener... order yours now!

- GD-20A, 69 lbs... mechanism, (1) transmitter, (1) receiver... no money down, \$12 mo. **\$124.90**
- GD-20B, 70 lbs... mechanism, (2) transmitters, (1) receiver... no money down, \$14 mo. **\$144.90**
- Kit GDA-20-3 Heathkit mechanism, 61 lbs... no money dn., \$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**



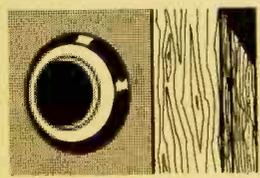
### "Pocket-Size" Portable VHF Transmitter

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... less CB interference. Transistorized for long life, reliable performance.



### Sensitive, Superregenerative VHF Receiver!

Takes just a few minutes to install in your garage!... operates on 230 to 290 megacycles... requires no license. Both transmitter & receiver are completely assembled, ready to install.



### Manual Operating Switch

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

**KIT MECHANISM SPECIFICATIONS**—125" long x 8¾" high x 13" wide. 100# max. operating force. Operates overhead track and most jamb & pivot doors up to 8' high. 117 V. AC. ¼ H.P. motor. Fused.

**VHF TRANSMITTER SPECIFICATIONS**—Powered by two Eveready #E-91 alkaline batteries. Uses one of six modulation frequencies approx. 16 kc, 18 kc, 20 kc, 22 kc, 24 kc, 26 kc. CK5676 RF osc. tube, 2N270 audio osc. transistor. 5½" H x 3" W x 1½" D.

**VHF RECEIVER SPECIFICATIONS**—117 VAC, 10 watts. 6AB4 RF amplifier, 12AT7 detector-amplifier, 12AT7 amplifier-rectifier, 5696 relay control. RF frequencies approx. 230 mc, 240 mc, 250 mc, 260 mc, 270 mc, 280 mc, 290 mc. 5¾" H x 6" W x 6½" D.



# Handy Heathkit® Tools for Workshop & Kit-Building



GD-973A  
\$17.50

(A)



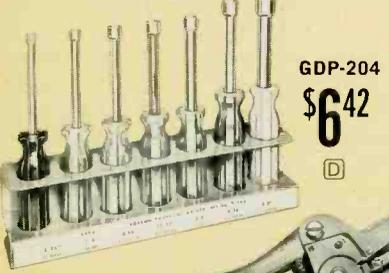
GH-52  
\$14.95

(B)



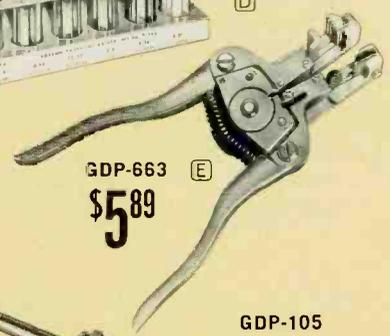
GH-25  
\$16.95

(C)



GDP-204  
\$6.42

(D)



GDP-663  
\$5.89

(E)



GDP-105  
\$5.40

(F)



**(A) Add Longer Life To Drills, Bits, Blades, Etc. With This Motor Speed Control! Now With Higher Current Handling Capability!**

- Silicon Controlled Rectifier with feedback circuit slows motor, yet maintains high torque power
- Use with drills, saws, mixers, 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
- Prolongs life of drill bits, blades and other attachments
- Simple to build, easy to use

LIKE TO SAVE THOSE PRECIOUS BITS & BLADES? With the Heathkit GD-973A Motor Speed Control you can! Allows you to slow down the motor speed of a power saw, drill, etc. to almost "stop," and still maintain "full speed" power.

USE WITH A MULTITUDE OF POWER MOTOR DEVICES! Specially designed to slow down any universal AC-DC motor with a rating of 15 amperes or less, the GD-973A works with power drills, sabre saws, food mixers, sewing machines, food blenders, sanders, movie projectors, lathes, vibrators, etc. Bore through the toughest steel or the hardest wood with ease and *without* ruining a good blade or bit! Attractively housed in a black & beige aluminum cabinet. Goes together in a couple of hours. Ideal for your home workshop.

Kit GD-973A, 2 lbs. . . . . \$17.50

GD-973A SPECIFICATIONS — CURRENT CAPACITY: Any universal motor powered device with a name-plate rating of 115 volts, 15 amperes or less. (Will not operate induction motors.) Idle power consumption: 3 watts. Front panel controls: Power switch, speed control. Power source: 105-125 v. AC, 60 cps. Dimensions: 6" L x 3 3/4" W x 3 1/2" H.

**Kitbuilder's Special!**

1 lb. Bag Of Assorted Extra Heathkit Hardware . . . Nuts, Bolts, Washers, Etc.! Only \$2 With Any Heath Co. Order.  
GH-14, 1 lb. . . . . \$2.00

**(B) Heathkit Soldering Iron Kit . . . The Best For Kit-Building!**

LIGHTWEIGHT . . . COMPACT . . . EASY-TO-HANDLE! Ideal for kit-building or any "tight" soldering work. The 6 volt, 25-watt General Electric midget-type industrial soldering iron features a long-life, iron-clad tip that *won't* corrode or require frequent "tinning." Connects to high or low voltage lines to effectively provide selection of 8 heat ranges . . . handles any soldering job from "low-heat" circuit board to "hot" heavy-duty chassis work! Excellent heat recovery time! Includes transformer-operated power supply and protective metal cage. Order yours now!  
Kit GH-52, 5 lbs. . . . . \$14.95

**(C) New Deluxe Tool Set**  
A FINE ASSORTMENT OF QUALITY TOOLS! Makes kit-building or any fix-it job quick, easy and fun. Includes a combination wire stripper and diagonal sidecutter; midget long-nose pliers; 3 screwdrivers (3/32", 1/8", 3/16"); new American Beauty "Little Dandy" Electric Soldering Iron (see below for full descrip.); soldering instruction booklet; solder joint brush; radio solder; 5 nut drivers (3/16", 1/4", 3/8", 7/16", & 1/2"); nut starter and soldering aid.  
Model GH-25, 6 lbs. . . . . \$16.95

**(D) VACO Hollow Shaft Nut Driver Set No. S-700 . . . Time Saver!**  
IDEAL FOR KIT-BUILDING AND A MULTITUDE OF "FIX-IT-YOURSELF" JOBS! All seven drivers feature special hollow-shaft design for nut installation on controls, switches, etc.! All can be conveniently stored in its own handy self-supporting metal rack. The tough plastic handles are color coded for easy identification. And the shanks are made of a strong polished alloy steel. Seven popular, most-used sizes: 3/16", 1/4", 5/16", 11/32", 3/8", 7/16", and 1/2". Fix it faster, easier with this labor-saving set . . . choose yours now!  
Model GDP-204, 3 lbs. . . . . \$6.42

**(E) SPEDEX Wire & Cable Stripper Model 766-1 . . . Save \$4.06!**  
A TIME-SAVING ACCESSORY AT A MONEY-SAVING PRICE! Here is a precision tool every workshop should have in its tool rack. No special skill is required to operate it, just insert the wire into its jaws and squeeze the handle . . . insulation is off in a flash! This heavy-duty mechanism has graduated jaws to accept number 10, 12, 14, 16, and 22 wire. Manufactured by General Cement for rugged service.  
GDP-663, 2 lbs. Mfrs. list \$9.95. Net \$5.89

**(F) NEW! "Little Dandy" Electric Soldering Iron! Recommended For Kit-Building!**

A GENUINE AMERICAN BEAUTY FOR ONLY \$5.40! Perfectly balanced, lightweight, easy to handle . . . ideal for general kit assembly, circuit boards, and a host of other soldering jobs. Heats quickly . . . reaches working temperature 2 minutes after plug-in! Stays hot, ready to solder! Features a long-life 30-watt heating element in stainless steel casing: 1/8" short screwdriver-type, iron-clad tip that won't corrode, and does not require fre-

quent "tinning"; flexible, 2-wire neoprene cord; molded Lexam® handle that's impervious to grease, oil, perspiration (note "anti-roll" feature); aerated, finger-tip Tente® grip that's unbelievably cool; and heat-deflecting baffle. Not a "throw-away" iron . . . all major parts replaceable with genuine American Beauty parts.  
Model GDP-105, 1 lb. . . . . \$5.40

# Time & Step Saving Intercoms!



GD-51A  
\$22<sup>95</sup>



GD-121  
Master  
Station  
\$29<sup>95</sup>

GD-131  
Indoor  
Remote  
\$8<sup>95</sup>

## Heathkit Portable "Wireless" Intercom . . . Plugs In Anywhere!

- 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 • New variable squelch to hush background noise

**PLUG IT IN . . . PUSH THE LARGE PRESS-TO-TALK BAR . . . AND TALK!** That's all there is to it. To listen, just release the GD-51's press-to-talk bar. Provides instant 2-way communications between you and other family members. Saves valuable time and steps. Eliminates annoying shouting. Use any number of units anywhere. Den, garage, kitchen, bedroom, basement . . . as long as units operate on the same power line! No need for batteries!

talk bar has a spring-keeping tabs on the . . . And think of the with a pair of these

transistor circuit for new variable squelch . . . and two indicator build with point-to . . . takes just two or are styled in 2-tone a pair!

..... \$45.90  
..... \$22.95

cycle AC or DC. Stand-selected). Size: 6 1/4"

Have you read about the wonderful new Heathkit 25" Color TV on pages 14 & 15? Only a limited supply will be available in time for Christmas. You can reserve yours now—fill out the card on page 15.

## Enjoy Indoor-Outdoor Communications With This Versatile Intercom System!

- Master unit handles up to 5 remote stations • Ideal for home, offices, commercial institutions • Weatherproof outdoor remote
- Powerful, one-watt output for crisp, clear communications
- Compact, designer-styled cabinets

**LIKE TO KNOW WHO'S CALLING BEFORE OPENING THE DOOR?** You can . . . when you have a Heathkit Indoor-Outdoor Intercom System set up in your house. You simply converse with the caller through the outdoor remote unit. Provides an added measure of household security . . . 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, steps . . . and your voice!

**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 warmup . . . built-in power supply . . . separate listen and talk volume controls . . . and plastic beige cabinets.

**ANY TWO REMOTE UNITS CAN COMMUNICATE!** Thanks to the inter-remote communications 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 features a 3-position listen-talk-monitor switch, 50' of 3-conductor wire, and matching beige plastic cabinet.

**CONVENIENT OUTDOOR REMOTE** features a rustproof aluminum grille, weatherproof seal, specially-coated speaker, a doorbell button, and 50' of 2-wire cable.  
Kit GD-141 Outdoor Remote, 2 lbs. . . . . \$5.95



Kit GD-121 Master Station, 6 lbs. . . No money down, \$5 mo. . . \$29.95  
Kit GD-131 Indoor Remote, 4 lbs. . . . . \$8.95

**SPECIFICATIONS**—Power requirements: 117 v ac 50/60 cycles 2.5 watts (idle), 3.5 watts (full output). Transistors: four 2N1274. Dimensions: 6 1/4" H x 8" W x 7 1/2" D (master), 5" H x 8" W x 6" D (indoor remote), 5 1/4" x 4 1/2" panel size (outdoor remote).



# Heathkit® "Table" Radios... Look and



GRA-21-1  
\$47<sup>00</sup>

GR-21  
\$56<sup>95</sup>

## Heathkit FM/FM Stereo Pair... Matched In Styling & Performance

• Monophonic FM table radio covers 88 to 108 mc • Receives FM stereo when used with matching GRA-21-1 Stereo Converter (opposite) • Large 6" x 9" dual-cone speaker • 7 tubes function like 11 • Handsome preassembled walnut cabinet

**START WITH THE FM TABLE RADIO!** You'll like the way it easily reproduces the vast array of FM programs. You'll like its simple, yet complete operating controls for full adjustment of the clean, robust sound. You'll like its compact size that fits virtually anywhere. You'll like its elegant styling that harmonizes with any decor. You'll like its easy-on-the-budget price... only \$59.95.

**HERE'S WHY THIS KIT PERFORMS SO WELL!** First, there's the large 6" x 9" extended-range, dual-cone speaker with a 6.8 oz. magnet that provides true hi-fi reproduction. Then there's the transformer-operated power supply with silicon diode rectifiers for safe, efficient performance... the Automatic Frequency Control that's easily switched on for radiantly clean, drift-free reception... smooth flywheel tuning, large edge-lighted slide-rule dial, and guiding tuning "eye" for accurate station tuning... switched AC power socket for accessory power if desired... separate tone and volume controls... a built-in line cord antenna for strong local signal pickup... and external antenna terminals for crystal-clear, long-distance station reception. And the FM Multiplex Output Jack and auxiliary audio input are designed to convert the GR-21 for FM stereo with the GRA-21-1 Multiplex Converter (opposite)... makes a handsomely matched pair!

The ruggedly attractive, factory-assembled walnut cabinet with a speaker grille that's offset from the front makes the GR-21 a proud addition to any den, living room, rec room or college dorm... measures just 15" L x 8" H x 6" D. The electronics go together quickly and easily, too... with preassembled and aligned "front-end" tuner. Order yours now!

Kit GR-21, FM Table Radio, 18 lbs... No money down, \$6 mo... \$56.95

• FM Stereo Converter—completely self-contained, self-powered • Operates with GR-21 (opposite)... matching walnut cabinet styling • Can be operated up to 15' away from GR-21 radio • Quality components assure long, faithful service • Simple controls maximize stereo effect

**NOW ADD THE FM STEREO CONVERTER!** And sit back and listen to the enchanting realism of FM stereo... just like being at the orchestral hall! You can use the GRA-21-1 Converter with the GR-21 Table Radio for both stereo and monophonic listening! Or use the GR-21 Radio alone. Both units match in styling as well as performance!

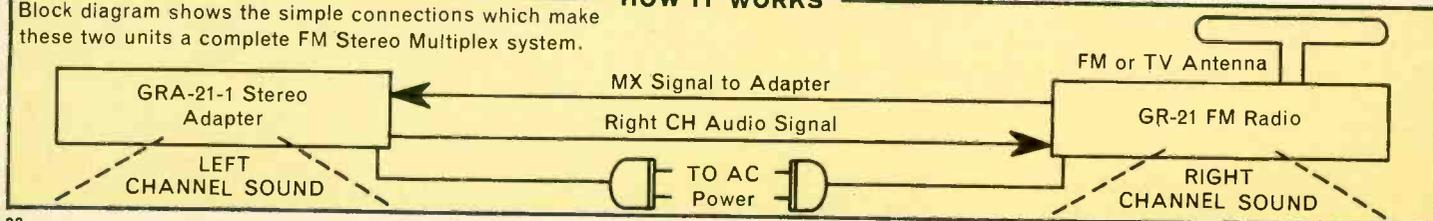
**ENJOY BROAD CHANNEL SEPARATION FOR MAXIMUM STEREO EFFECT!** The GRA-21-1 can be operated as far as 15 ft. away from the Table Radio for optimum stereo listening. And a stable, synchronized local oscillator is keyed to the stereo "pilot" that's incorporated in the new FM multiplex transmissions... restores a strong subcarrier to assure low distortion! Carefully designed filter networks separate the stereo signal without degrading phase distortion.

**SIMPLE CONTROLS ASSURE OPERATING EASE, MAXIMUM PERFORMANCE!** Like the converter's master volume control that adjusts both channels... the receiver volume control that easily balances with the converter... the tone control that functions independently of the radio's... the function selector switch for choosing desired mode of operation, and turning off the AC power to the converter when not in use. The full-wave power supply uses modern silicon rectifiers and a power transformer for safe operation, low hum level, and long tube life with a minimum of heat.

**OTHER FEATURES MATCH THE GR-21!** Features the same 6" x 9" speaker, hi-fi audio circuitry, ease of assembly and beautiful walnut-finished cabinet with identical compact measurements! Choose both units now! Kit GRA-21-1, Stereo Converter, 18 lbs... No money down, \$5 mo. \$47.00

### HOW IT WORKS

Block diagram shows the simple connections which make these two units a complete FM Stereo Multiplex system.



# Sound Great in Any Room!



GR-10  
\$16<sup>95</sup>

## Ideal "Extra" Radio For Den, Rec Room, Children's Room . . . AM Table Model!

- Vernier tuning for smooth easy station selection
- Safe transformer isolated power supply
- Handsomely styled in beige and ivory plastic
- Quick and simple to build . . . easy to own

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.

COMPARE ITS HIGH PERFORMANCE FEATURES! There's a vernier action knob for smooth, accurate tuning . . . highly selective circuits for good station selection . . . a high quality ferrite rod antenna for strong local reception . . . terminals for an external antenna to pull in far distant stations . . . a neon indicator light that gently reminds you that the unit is on or off . . . and safety-engineered, transformer-operated power supply.

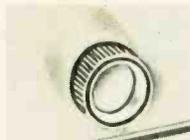
SIMPLE TO ASSEMBLE! No special skills, tools, or technical background needed. You'll have the GR-10 plugged in and playing after about 4 to 6 enjoyable hours.

Kit GR-10, 7 lbs. . . . . \$16.95

GR-10 SPECIFICATIONS—Frequency coverage: 550-1650 kc. IF Frequency: 455 kc. Power requirements: 105-125 volts AC 50/60 cps. Speaker: 3" P.M. Antenna: Built-in ferrite rod. Dimensions: 5<sup>3</sup>/<sub>16</sub>" H x 10<sup>1</sup>/<sub>16</sub>" W x 5<sup>3</sup>/<sub>16</sub>" D.



TRANSFORMER OPERATED power supply for safety.



VERNIER-ACTION TUNING for easy station selection.



GR-11  
\$23<sup>50</sup>

## Enjoy The Quiet Beauty Of FM With This 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 start enjoying the quiet, crystal-clear fidelity of FM with the GR-11. Its low \$23.50 price puts it easily within any budget. Yet its quality and performance compare to models costing far more. You'll like its compact styling, and attractive looks, too. Ideal for placing anywhere in your house.

DELUXE FEATURES INSURE DELUXE PERFORMANCE! Features like the transformer-isolated power supply which eliminates shock hazards . . . vernier tuning for smooth, precise station selection . . . a five tube circuit that performs like seven . . . a built-in line cord antenna for local station pickup . . . separate terminals for an external FM antenna (you can use your TV antenna instead to receive distant stations) . . . and a neon "off-on" indicator light. Goes together quickly and easily, too. Takes around 5 hours with the simple step-by-step instructions, and factory aligned tuning coils.

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

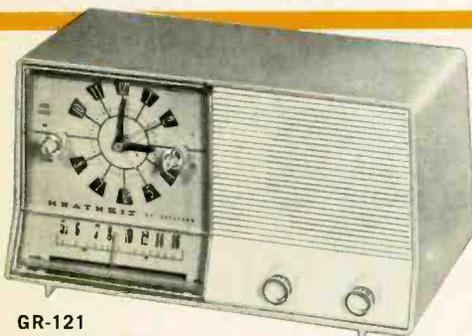
GR-11 SPECIFICATIONS—Frequency coverage: 88—108 mc. IF frequency: 10.7 mc. Power requirements: 105-125 volts AC 50/60 cps. Speaker: 3" P.M. Antenna: built-in line, provision for external antenna. Dimensions: 5<sup>3</sup>/<sub>16</sub>" H x 10" W x 5<sup>3</sup>/<sub>16</sub>" D.



TRANSFORMER OPERATED power supply for safety.



PREASSEMBLED TUNING UNIT for fast kit building and factory-aligned performance.



GR-121  
\$28<sup>50</sup>

## A Busy Household Helper . . . 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! By gently waking you with music . . . no more rude buzzes or clangs. But if you are a "heavy" sleeper, an alarm sounds 10 minutes later to insure "wake-up". Meanwhile the clock/timer automatically starts your morning coffee. What could be more convenient!

And throughout the day, the GR-121 lightens your chores by entertaining you with your favorite programs. Keeps you posted on the latest news, weather, and sports. And when nighttime rolls around, this faithful servant lulls you to sleep. Even has a pillow speaker output for private listening.

A HOST OF OPERATING CONVENIENCES! The GR-121 automatically turns itself off at any pre-set interval up to an hour. Features a built-in ferrite rod antenna for strong local station reception. And the clock/timer unit has a sweep-second hand. Easy to build, too . . . no special skills or knowledge required. The beige & ivory plastic cabinet harmonizes with any room's decor.

Kit GR-121, 8 lbs. . . . no money dn., \$5 mo. . . . . \$28.25

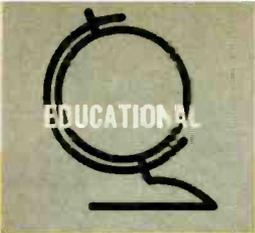
GR-121 SPECIFICATIONS—Circuit: 5-tube superheterodyne. Frequency coverage: 535-1620 kc. IF frequency: 455 kc. Power supply: 115 v., 60 cycle, AC only. Speaker: 3" P.M. Controls: On/off volume, tuning, "Sleep Switch," "Radio Alarm." Dimensions: 5<sup>1</sup>/<sub>16</sub>" H x 10<sup>1</sup>/<sub>16</sub>" W x 5<sup>3</sup>/<sub>16</sub>" D.



TRANSFORMER OPERATED power supply for safety.



TIMER OUTLET automatically turns on appliances.



# "Learn-By-Doing" Educational Kits

EK-1  
\$19<sup>95</sup>



## Basic Electricity Kit

- Teaches principles of voltage, current & resistance
- Designed by a science educator
- Excellent starting point for career or spare time hobby

**IDEAL FOR BEGINNERS & STUDENTS IN ELECTRONICS.** The EK-1 teaches basic theory of voltage, current, resistance, series & parallel DC circuits, meter circuits, and Ohm's Law in an interesting fun-to-do manner.

**A KIT/TEXTBOOK COMBINATION.** The student begins by performing basic experiments with dry-cell batteries, then starts the assembly of a volt-ohm-milliammeter which, when completed, is used to verify theorems in the text. The manual is profusely illustrated with pictorial diagrams that guide the reader through each phase of the various experiments. The textbook language is written so that meanings are fully grasped without the need of a technical vocabulary or knowledge. Final product is a handy test instrument that can be used for countless measurements in electronic circuits.

Kit EK-1, 4 lbs. . . . . \$19.95

EK-2A  
\$18<sup>75</sup>  
(less cabinet)



## 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
- Fascinating experience in the world of communications

**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.

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 kc & 3-10 mc).

Basic Radio Part I (EK-2A), 7 lbs. . . . . \$18.75

Basic Radio Part II (EK-2B), 5 lbs. . . . . \$18.75

Accessory Cabinet for completed receiver, AK-8, 3 lbs. . . . . \$3.95

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



## Basic Transistors

- A kit/textbook project
- Teaches transistor concepts & applications

**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. This combination kit/textbook course uses the learn-by-doing concept to vividly illustrate basic theory by interesting experiments.

**A WIDE VARIETY OF EXPERIMENTS.** Some of the test circuits assembled by the student 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 transistor intercommunications systems.

**PROVIDES AN EXCELLENT BACKGROUND.** Basic transistor theory gained through this course will simplify servicing and trouble-shooting of transistorized circuitry and equipment. The EK-3 is also an ideal course for the beginner (adult or student), and an excellent refresher course for the service technician.

Kit EK-3 Basic Transistors, 4 lbs. . . . . \$16.95

EK-3  
\$16<sup>95</sup>



Manual only for EK-Series \$5.00 each, 10 or more copies \$3.00 each.

## Heathkit Experimenter Electronic Workshop "19"

- Ideal Gift for youngsters of all ages
- Makes 19 different, fascinating electronic transistor units
- Provides countless hours of educational fun
- "Solderless" spring-type connectors for fast, easy circuit changes
- Uses safe flashlight battery power
- Simple, cartoon-illustrated instructions and educational operating principles in non-technical language

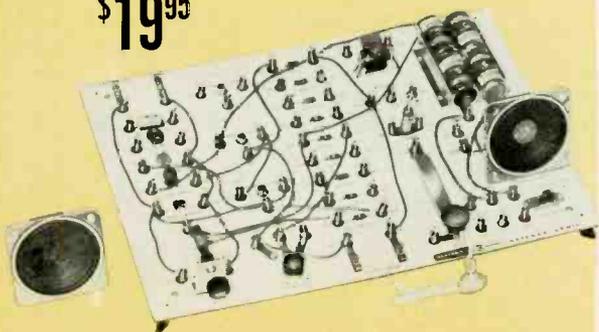
**19 DIFFERENT ELECTRONIC UNITS!** Imagine the fun he'll have playing with a code flasher, burglar alarm, public address system, 5 transistor radios, electronic eye, TV silencer, metronome, wireless code and voice transmitter, etc. . . . all made by *him* on one giant circuit board. Circuit changes are easy to make and components can't get lost for they mount permanently on the circuit-workboard. All power is provided by safe, inexpensive flashlight batteries (not included).

**EASY INSTRUCTIONS!** Complete explanations of how-to-build, plus the "how" and "why" of each experiment in everyday, non-technical language.

**COMPLETE FEATURE-PACKED KIT!** Includes circuit board, 3 transistors, crystal earphone, two 3" cone-type speakers, a photo cell, relay, tuneable coil, potentiometer, resistors, capacitors, all hardware, solderless connectors, screwdriver, and instructions. A real bargain at this low price . . . order one for your youngster today.

Kit SK-50, 4 lbs. . . . . \$19.95

SK-50  
\$19<sup>95</sup>



# Photo Aids For Better Prints in Less Time!



## Heath/Mitchell Fotoval® Darkroom Computer . . . Assures Uniform Prints In Less Time At Lower Cost!

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

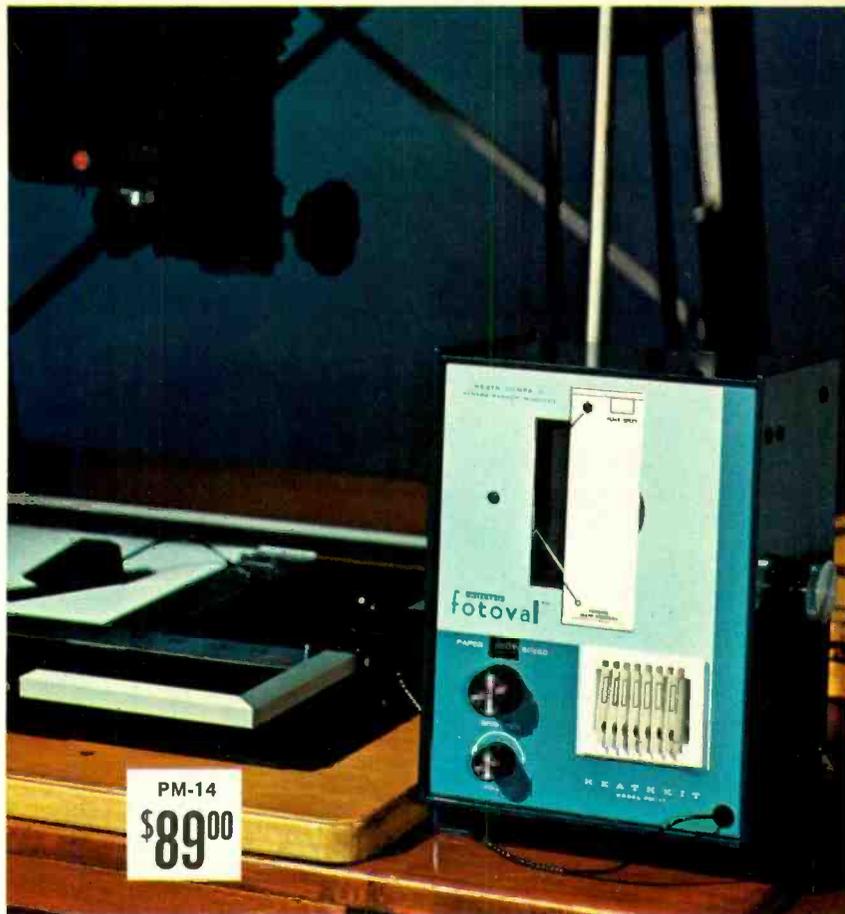
**THE FIRST PRINT IS THE PRINT!** Unbelievable? Not with the revolutionary Heath/Mitchell Fotoval® Computer System in your darkroom. Just one simple standardizing procedure, and you start producing any amount of beautiful black & white prints quickly, economically. *No* more wasting expensive printing paper . . . *no* more long, laborious hours wasted in the darkroom . . . *no* more guessing which paper grade to use, or how long to expose each print. Imagine the savings in time, paper and money!

**HOW DOES IT WORK?** With the unique Fotoval 35 mm Test Negative, you quickly & simply determine accurate exposure times for each type & grade of paper or variable contrast filter. You then record this information on the computer scales provided. Next, select the desired paper type & surface, 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 detailed highlight, and read the exposure time & paper grade (or filter) directly from the computer. Expose for the indicated time and develop. That's all there is to it. All prints will have uniform contrast & density.

**PRINTS CAN BE DEVELOPED ANYTIME BY ANYONE!** Since all variables are held constant, you keep making prints while someone else, regardless of experience, develops the prints you've already made! Or the undeveloped prints can be stored in a light-tight box for developing at a later time.

**IDEAL FOR THE NOVICE AS WELL AS THE PROFESSIONAL!** To the professional photographer or printer, the advantages of Fotoval are obvious . . . more prints in less time, consistent print quality, lower paper costs, more profits! The easy operation and simple-to-follow instructions make it simple for the beginner to experience remarkable results, even if he's never attempted enlarging before!

**FAST & EASY TO ASSEMBLE!** You'll find the Fotoval as easy to build as it is to use. Requires no special skills or knowledge.  
 Kit PM-14, 8 lbs. . . no money dn., \$9 mo. . . . . \$89.00  
 Export model available for 115/230 VAC, 50-60 cps; write for prices.



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

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



easily in your hand & easel corners. Magnetized base assures adhesion when placed on working surface.

**Light-Sensitive Probe**  
 Incorporates all important switching. Measures extremely small light areas when scanning negatives for desired shadows & highlights. Fits

## Now Control Exposures in Tenths Of A Second With The NEW Heathkit Photo Timer!



PT-15  
 \$24.95

- 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

**QUICKLY EXPOSE MANY PRINTS WITHIN A 2% DEVIATION ON ALL SETTINGS!** Now control exposure times in full seconds up to 99, or up to 9.9 in tenths of a second. *All* settings will be accurate within 2%. And since the time intervals are switch-selected, you can accurately reset any interval every time.

**QUICK & SIMPLE TO USE!** Simply set the desired exposure time and push the "start" button. The Heathkit Photo-Timer turns on the enlarger & extinguishes the safelight. At the end of the pre-selected interval, it automatically turns the enlarger off and the safelight on. And to quickly expose more than one print, simply tap the "Start" button to repeat the cycle . . . every exposure will be accurate to within 2% of the first interval. A spring-return "stop" switch halts exposure process, if you decide time interval is incorrect. Quick & easy to assemble, too.

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; 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 OAD2 regulator tube. **Power requirements:** 105-125 v. AC, 50/60 cps, 6 watts. **Dimensions:** 6 1/4" W x 6 1/2" D x 3 1/4" H overall.



# Entertaining Heathkit® Companions



GR-24  
\$28<sup>25</sup>

## New! Deluxe All-Transistor AM Portable . . . "Big-Set" Performance, Low Operating Cost, Modern Designer Styling!

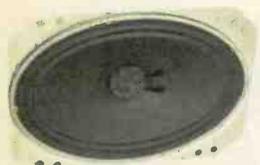
- 6 silicon transistor, 2 diode circuit gives 8 transistor performance • Uses standard "D" size flashlight batteries . . . only 1/10 the operating cost of typical pocket-size portables • Large 4" x 6" permanent magnet oval speaker for "big-set" sound • Easy-to-read slide-rule dial • "Thumb-touch" controls • 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

**DELUXE FEATURES THAT CAN'T BE MATCHED BY MINIATURES!** Like the big 4" x 6" PM speaker that provides a clean, bold sound . . . a large 1/2" diameter built-in rod antenna that pulls distant stations in with ease . . . a tuned RF stage and double-tuned I.F. stage for extra sensitivity and selectivity . . . an audio output stage that's diode biased for full performance over a wide temperature range even when battery voltage runs low . . . and a 6 transistor, 2-diode circuit that performs like 8 transistors—insures instant operation, long unchanging life. In actual side-by-side comparisons with miniatures & other portables, the GR-24 produced better station pickup, stronger volume & sharper reception!

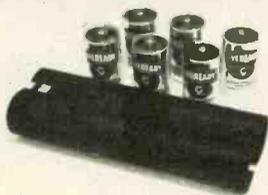
**OUTPERFORMS MINIATURES IN ECONOMY, TOO!** Cost only 1/10 as much as pocket-size models to operate! Uses 6 inexpensive size "D" flashlight batteries (not included). And a plastic battery holder protects against corrosion.

**YOU'LL LIKE ITS SMART, MODERN STYLING!** A rich black simulated leather case with a chrome-color plastic frame and anodized aluminum grille. And for quick simple station selection, there are two "thumb-touch" controls, plus an easy-to-read slide-rule dial. Carries easy, too, with its light weight, compact shape, and easy-grip handle. Assembly takes about 4 to 6 hours with fast stable circuit board construction.

**Kit GR-24, 5 lbs. . . no money dn., \$5 mo. \$28.25**  
**GR-24 SPECIFICATIONS** — Tuning range: 535-1620 kc. IF frequency: 455 kc. 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).



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 Take Along This Heathkit® All-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 grill

**A REFRESHING IDEA IN PORTABLE LISTENING!** Tired of the usual AM fare? Then take along the quiet beauty of FM with this compact, "go anywhere" Heathkit GR-61! Enjoy classical or standard favorites at the beach, on a camping trip, at the ballpark . . . anywhere your travels take you!

**EXTRA FEATURES INSURE HI-FI PERFORMANCE!** Like the 10 transistor, 2-diode circuit with 3 I.F. stages that deliver full fidelity & complete quieting . . . a push-pull output stage that

drives the 4" x 6" oval PM speaker for low distortion, "big-set" sound . . . external antenna terminals . . . and a headphone jack for private listening or connection to your hi-fi system.

**ASSEMBLES IN ONE OR TWO EVENINGS!** A pre-assembled "front-end," prealigned I.F. transformers and simple circuit board construction assure fast, easy assembly. Operates on a leakproof 9-volt battery (not included).

**Kit GR-61, 6 lbs., no money dn., \$5 mo. \$44.95**  
**GRA-131-1, Self-contained, leakproof battery for above, 2 lbs. . . . . \$1.10**

**GR-61 SPECIFICATIONS** — Tuning range: 88 MC to 108 MC. IF frequency: 10.7 MC. Audio output: 250 milliwatts. Loudspeaker: 4" x 6" permanent magnet. Tone control: Treble-cut. Recommended battery: 9 volt. Long-life, leak-proof, NEDA #1612, Eveready #2356. 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<sup>95</sup>



# New! All-Transistor 23 Channel 5-Watt CB!



Only 3 Simple Controls . . . on/off volume, squelch & channel selector. Panel "S" meter for relative power output & signal strength measurements.



Operates "Fixed" . . . with accessory AC power supply.

## 4 MONEY-SAVING REASONS FOR YOU TO BUY HEATHKIT® CB!

1. New Lower Prices On All Units!
2. 5% Discount On two 5-Watt Unit Buy!
3. New Lowest Cost All-Transistor 5-Watt Transceiver . . . Kit Or Wired!
4. Lowest Crystal Prices . . . Only \$1.99 Each with order of 1 or more transceivers!



Kit GW-14  
\$89<sup>95</sup>  
Assembled GWW-14  
\$124<sup>95</sup>

## Solid-State Circuit Provides Instant Operation, Low Battery Drain . . . Compact, "Fit-Anywhere" Size . . . Transmit & Receive On All 23 Channels . . . Available Kit Or Factory Assembled!

- 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.

**ALL-CHANNEL CAPABILITY!** Now transmit & receive on *all* 23 CB channels with this new Heathkit Transceiver. Just flip to any desired channel on the illuminated channel selector, and you're ready for instant 2-way communications. And its 14 transistor, 6 diode circuit keeps the GW-14 running cool . . . no component deterioration as with tube types. Draws only .75 amps when transmitting —.12 amps on receive. You can also easily

disable the pilot lights to further reduce "standby" current on receive . . . down to only .06 amps!

**IDEAL FOR SMALL SPACES!** You'll like the GW-14's compact size, too . . . only 2 7/8" H x 7" W x 10 1/2" D. Fits virtually anywhere . . . under the dash of your car or boat, tractor, etc. And in any position, thanks to the gimbal mounting bracket. Due to its compact size and low current drain, the GW-14 is also ideal for the Highway Emergency Locating Plan (H.E.L.P.—channel 9).

**A FULL 5 WATTS FOR "KING-SIZE" CB PERFORMANCE!** And its minimum 3 watt RF output using a "twin pi" network provides increased efficiency and maximum harmonic attenuation. Relay switching has also been incorporated for complete circuit isolation between transmitter & receiver sections . . . eliminates interaction problems.

**ONLY 3 SIMPLE CONTROLS TO OPERATE!** An on/off/volume control, adjustable squelch, & illuminated channel selector. In addition, there's an improved adjustable squelch control that eliminates all speaker hiss during standby. And the automatic noise limiter minimizes ignition system and motor noise.

**GOES TOGETHER EASILY!** All parts mount on a single circuit board to reduce the chance for wiring errors. And to facilitate servicing & trouble-shooting, the foil circuit pattern is screened on the board top . . . allows quick circuit tracing! Includes a smartly styled ceramic microphone, DC power cables, and crystals for one channel—specify channel no.

(See pg. 104 for additional crystal prices.) For 12 V., negative ground only. FCC license required. Use must comply with Part 95 of F.C.C. Regulations.

**Kit GW-14**, 8 lbs., no money dn., \$9 mo. \$89.95  
Accessory power supply for 117 v. AC "fixed" station operation will be available soon.

**Assembled GWW-14**, 9 lbs., no money dn., \$12 mo. . . . . \$124.95

### COMPLETE 23-CHANNEL CB CRYSTAL PACKAGE . . . \$79.95!

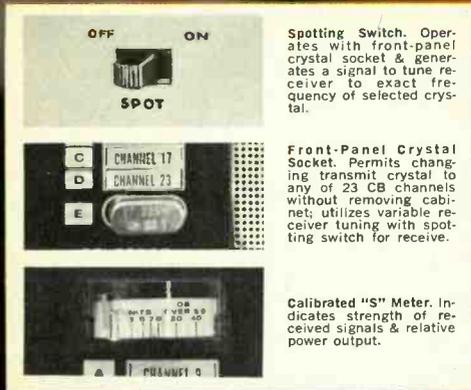
A regular \$135.70 value! Includes transmit & receive crystals for all CB channels for complete GW-14 operating capability . . . a total of 46 crystals. For maximum versatility, this package is your best dollar buy!  
**GWA-14-2**, 1 lb. no money dn., \$8 mo. \$79.95

**GW-14 SPECIFICATIONS—RECEIVER SECTION:** General description: 6-transistor superheterodyne circuit with RF amplifier, squelch, noise limiter, 23-channel crystal controlled tuning with tuning and relative signal strength indicator. **Intermediate frequency:** 455 kc. **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 peak. **Power requirements:** Positive 12 volt system (13.4 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.

Save 5% When You Buy 2 Or More 5-Watt Transceivers; Just Deduct 5% From Order Blank. New Lower Prices On All Units!

CITIZEN'S BAND

Save 5% On Order Of 2 Or More Heathkit®



**Spotting Switch.** Operates with front-panel crystal socket & generates a signal to tune receiver to exact frequency of selected crystal.

**Front-Panel Crystal Socket.** Permits changing transmit crystal to any of 23 CB channels without removing cabinet; utilizes variable receiver tuning with spotting switch for receive.

**Calibrated "S" Meter.** Indicates strength of received signals & relative power output.



MW-34  
\$84.95  
Was \$89.95

**Deluxe 5-Channel "Fixed Or Mobile" CB Transceiver . . . Versatile Performance Features!**

- 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

**TRANSMIT ON ANY OF 23 CHANNELS!** The MW-34 boasts 5 crystal-controlled transmit & receive channels with a front-panel socket for quick, easy changing of one transmit crystal *without* removing the cabinet. For the receive function you use the spotting switch in conjunction with the variable receiver tuning. The spotting switch turns on the transmitter oscillator *without* going on the air, thus generating a signal for tuning the receiver to the same frequency as the transmitter.

In addition, a TVI filter is built in to minimize interference with nearby TV sets. Also has a calibrated "S" meter which automatically shifts from transmitter to receiver to indicate signal strength & relative power output.

**IDEAL FOR BOAT, CAR, & 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 communica-

tions. Its rust-resistant black & white aluminum cabinet matches Heathkit marine gear; provides additional boating communications in many areas.

**MORE DELUXE OPERATING CONVENIENCE!** Superhet receiver with RF stage permits tuning of all 23 CB channels with lighted dial and accurate vernier tuning. Also has adjustable squelch, automatic noise limiter, and built-in speaker.

**SIMPLE TO BUILD!** New 2-color, step-by-step instructions speed assembly. Includes PTT mike, AC & DC power cords, crystals for 1 channel (specify freq.), FCC license pack. Use must comply with Part 95 FCC regulations.

**Kit MW-34, 18 lbs. . . . No money down, \$9 mo. . . . Was \$89.95 Now \$84.95**

**MW-34 SPECIFICATIONS—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 mc). **Crystal-controlled receiver tuning:** Any five of 23 Citizen's Band channels determined by particular crystals installed in unit. **Intermediate frequency:** 455 kc. **Sensitivity:** 1/2 uv for 10 db signal-to-noise ratio. **Selectivity:** 5 kc @ 6 db down from peak response. **Audio response:** 300 to 2500 cps ±3 db. **Input impedance:** 50 to 70 ohm. **TRANSMITTER SECTION:** **Nominal power input to final RF amplifier:** 5 watts. **Frequency control effectiveness:** Within .005% of crystal frequency over ambient temperature range of -20 to +130° F. **Modulation:** AM plate modulation automatically limited to less than 100%. **Output impedance:** 50 to 70 ohm. **GENERAL SPECIFICATIONS—Meter:** For receiving, S9 scale indication corresponds to approximately 30 microvolts signal input. Usable deflection is obtained with signals as small as 2 microvolts. **External controls:** Volume/Off-On; Squelch; Selector switch with five crystal receive positions & provisions for 23 transmit channels by using external mounted crystal socket on front panel; Spot switch. **Power requirements:** 105-125 volts, 50/60 cps, AC 72 watts. 12 volts DC, 4.5 amperes; 6 volts DC, 9 amperes. **Dimensions:** Overall, 4 3/8" H x 8 3/8" W x 11" D.

**Low-Cost CB Transceiver . . . Ideal**

**Where Only 1 Channel Is Desired!**

GW-12A  
\$34.95  
Was \$39.95



- 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

**SOLID 1-CHANNEL CB COMMUNICATIONS IN ONE LOW COST PACKAGE!** Ideal for mobile fleets where only one channel is needed. No missed calls or unnecessary usage! And think of the time and effort you could save with a home and car installation! Savings that will pay for the GW-12's low price many times over.

**CHECK THESE FEATURES!** Automatic noise limiter & adjustable squelch minimize receiver noise & ignition interference for crisp, clear communications. An AC power supply is built-in, along with provision for simple plug-in connection of a DC power supply for 6 or 12 v. operation. Includes attractive 2-tone brown metal cabinet, PTT mike and crystals for 1 channel (specify freq.). Use must comply with Part 95 FCC regulations.

**Kit GW-12A (AC only), 10 lbs. . . . No money dn., \$5 mo. Was \$39.95 \$34.95**

**Kit GW-12D (AC & DC), 13 lbs. . . . No money dn., \$5 mo. Was \$44.95 \$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 kc 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 3/8" H x 8 3/8" W x 6 1/2" D.

# 5-Watt CB Transceivers!



**4-TONE SELECTIVE CALL**  
Permits individual call of up to four units operating on the same frequency. Gives added enjoyment to CB operations by eliminating unwanted CB conversations, speaker hiss and noise.



**LARGE SLIDE-RULE DIAL**  
Tuning dial is illuminated for easy reading at night and features planetary drive for smooth, easy station selection. Built-in tuning meter shows incoming signal strength and relative power output.

**Save \$20 On This Deluxe 5-Channel  
"Master Station" CB Transceiver . . .  
Operate Fixed Or Mobile!**

GW-42  
**\$99<sup>95</sup>**

Was \$119.95

- 5 crystal-controlled transmit & receive channels • Built-in 4 tone selective call circuitry • All-channel receiver tuning • Tuning meter • Built-in 3-way power supply • Adjustable squelch • Switchable automatic noise limiter • Easy to build

**RUGGED & READY TO GO ANYWHERE!** Car, truck, barn, office, home, etc. Ready to put you in complete command of any 2-way CB radio set-up. Ready to shorten the time and distance required for efficient farm, business or personal communications. Compare the GW-42's features and specifications. You'll be surprised that so much performance could be packed into one compact unit at so little a price. Now only \$99.95 . . . a savings of \$20!

**SELECTIVE CALL . . . FIXED OR MOBILE OPERATION!** Built-in 4-tone selective call circuitry permits individual call of up to 4 units on any one of the 23 CB channels—92 possible combinations in all! Also eliminates unwanted CB conversations. You hear only calls from other units operating on same selective call frequency.

Other features include a built-in 3-way power supply for 6 or 12 v. DC, and 117 v. AC operation; 5 crystal-controlled transmit & receive channels . . . a tremendous help when the bands are crowded; variable receiver tuning of all 23 channels with 1/2 microvolt sensitivity; efficient 5-watt input transmitter; switchable automatic noise limiter; and large slide-rule dial with planetary drive and built-in tuning meter for accurate easy station selection.

**ATTRACTIVE STYLING . . . EASY TO BUILD!** A 2-tone brown metal cabinet with anodized trim makes a handsome addition to any surroundings. Thoughtful circuit design, with 3 circuit boards and precut cabled wiring harness, makes assembly an easy and fun-filled experience that's as rewarding as the final product. Includes PTT microphone, AC & DC power cables, FCC license pack, and crystals for 1 channel (specify freq.). Use must comply with Part 95 FCC regulations.

Kit GW-42, 23 lbs. . . No money down, \$10 mo. . . was \$119.95 Now \$99.95

**GW-42 GENERAL DESCRIPTION—RECEIVER SECTION:** 6 tube superheterodyne circuit with RF amplifier, squelch, noise limiter, variable or crystal receiver tuning, tuning meter and built-in tone squelch with four front panel selected tones. **Tuning range:** [Crystal] Up to 5 switch selected channels (Variable); Tunes all 23 channels. **Intermediate frequency:** 455 kilocycles. **Sensitivity:** 1/2 microvolt or less for a 10 db signal to noise ratio. **Selectivity:** 40 db attenuation with adjacent channel 10 kc away. **TRANSMITTER SECTION:** **Nominal power input to final RF amplifier:** 5 watts. **Frequency control:** 3rd overtone quartz crystal as selected by the 5 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:** AM plate modulation, automatically limited to less than 100%. **Output impedance:** 50-70 ohm. **TONE SQUELCH SECTION:** **Frequency control:** Resonant reed relay; with reeds used for generation of calling tone and frequency selection during monitoring. **Controls:** Volume on/off; Receiver tuning Channel Selector; Tone Selector; Call switch, Squelch on/off; Noise limiter on/off, Reset time control; Power selector. **Tube complement:** 6CB6, Receiver RF amplifier, 6U8, Triode receiver crystal oscillator, pentode mixer; 6C4, Variable oscillator; 6BJ6, 1st IF amplifier; 6BJ6, 2nd IF amplifier; 6BJ7, Detector diode, squelch diode, noise limiter diode; 6AN8, pentode first audio amplifier, triode microphone preamplifier; 6AQ5, Combination audio output/modulator; 6AU8, Triode transmitter oscillator, pentode driver, 6AQ5, RF-final amplifier, 6AN8, Voltage amplifier, cathode follower (tone squelch section); 6C4 Relay control tube (tone squelch section). **Power requirements:** AC at 105-125 volts, 60 cycles, 70 watts; 6VDC at 9 amps; 12VDC at 5 amps. **Dimensions:** 5 7/8" H x 17 1/2" W x 10 1/2" D.

**Save Up To \$15 On This 5-Channel Transceiver . . .  
Available With Or Without Selective Call!**



GW-22A  
**\$47<sup>95</sup>**  
Was \$59.95

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

**ENJOY ADDED CHANNEL SELECTION!** Choose any of 5 crystal-controlled transmit & receive channels. Use it anywhere . . . farm, home, car, etc.

**EXTRA PERFORMANCE FEATURES!** Sensitive superhet receiver with RF stage for greater range . . . built-in squelch & noise limiter for crisp, noise-free communications . . . push-to-talk microphone for simple operation . . . and external connectors for an extra speaker.

**OPTIONAL SELECTIVE CALL ON GW-32 MODELS!** Permits individual call up to 4 different units on same channel . . . up to 92 possible combinations. Eliminates unwanted CB calls, and speaker noise during standby.

**ALL MODELS INCLUDE PTT mike, power cable, crystals for 1 channel (specify freq.) 2-tone brown metal cabinet, & license forms. Use must comply with Part 95 FCC regulations.**

Kit GW-22A (117 v. AC), 13 lbs. . . No money down, \$5 mo. . . . . was \$59.95 . . . . . now **\$47.95**

Kit GW-22D (6 or 12 v. DC), 13 lbs. . . No money down, \$5 mo. . . . . was \$64.95 . . . . . now **\$49.95**

Kit GW-32A with Selective Call (117 v AC), 14 lbs., No money down, \$7 mo. . . . . was \$84.95 . . . . . now **\$69.95**

Kit GW-32D with Selective Call (6 or 12 v. DC), 14 lbs., No money down, \$8 mo. . . . . was \$89.95 . . . . . now **\$74.95**

**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 & GW-32A—117 volts, 50/60 cps AC, 50 watts; GW-22D & GW-32D—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.

CITIZEN'S BAND

# Shorten The Distance With A

## Deluxe 9-Transistor 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

**A VERSATILE PERFORMER!** Use for boat to shore communications, in-plant communications between lift trucks, handlers, etc., communication on a small farm, a roving microphone on convention floors, hunting & fishing trips, construction jobs; camping expeditions, surveyors, CB'ers . . . anywhere portable 2-way communications are needed!

**OPERATES UP TO A MILE BETWEEN UNITS!** Even greater distances with a Class "D" CB Transceiver or external antenna. Easy to operate . . . just set volume & squelch controls to desired level, push button to talk, release to listen!

**ANYONE CAN USE IT!** A license is *not* required for operation over the 26.97 to 27.27 frequency range when used in the manner described in FCC Regulations, Part 15. However, the GW-21 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 freq. no.) earphone for private listening. Simple circuit board assembly. Less battery. Choose a pair for extra savings.

- Kit GW-21A, 3 lbs. . . . . \$39.95
- No money down, \$5 mo. . . . . \$39.95
- Kit GW-21-2 (pair) 6 lbs. . . . . \$74.95
- 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 3/4" W x 1 1/2" D.

## Compact 4-Transistor Walkie-Talkie . . . Only \$35 A Pair!

- 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 1/4 MILE OR MORE!** Ideal for hunters, fishermen, farmers, and dozens of time & labor saving uses. Fits neatly in pocket, purse and your hand. And it's simple to use. Just flip it on, push to talk, release to listen. And no license, tests, forms, or age limit are required . . . anyone from Mom to the Boy Scout in your family can use it! Runs up to 70 hours on 9 v. battery. **SIMPLE TO BUILD, TOO!** Goes together in an evening. And its sturdy steel cabinet is attractively styled with a two-tone green enamel finish that's baked on for long wear & easy cleaning. Includes crystals (specify channel no.). Less battery. Pick a pair for added savings!

- Kit GW-31A, 2 lbs. . . . . \$19.95
- Kit GW-31-2 (pair), 4 lbs. . . . . \$35.00
- 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: 90 milliwatt. Battery: 9-volt. Antenna: 36" whip. Circuit: 4-transistor. Dimensions: 5 7/8" H x 3 3/4" W x 1 1/2" D.



GW-21A  
**\$39<sup>95</sup>**  
(PAIR \$74.95)



GW-31A  
**\$19<sup>95</sup>**  
(PAIR \$35.00)

## Special CB Accessories For Efficient Performance!

### Class D Citizen's Band Channel Nos. & Frequencies

#### CLASS D CITIZEN'S BAND CHANNEL NOS. AND FREQUENCIES

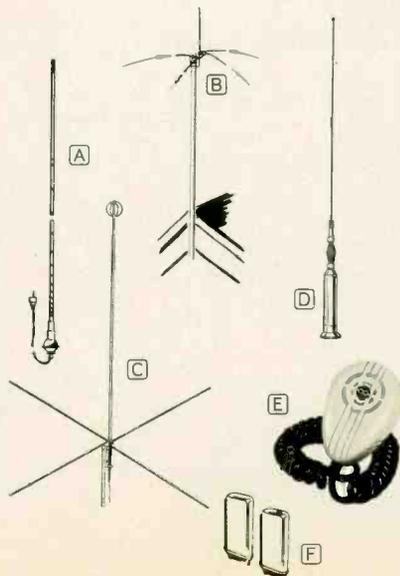
†1. 26.965 mc	7. 27.035 mc	†13. 27.115 mc	19. 27.185 mc
2. 26.975 mc	8. 27.055 mc	†14. 27.125 mc	20. 27.205 mc
3. 26.985 mc	†9. 27.065 mc	15. 27.135 mc	21. 27.215 mc
4. 27.005 mc	†10. 27.075 mc	16. 27.155 mc	22. 27.225 mc
5. 27.015 mc	†11. 27.085 mc	17. 27.165 mc	†23. 27.255 mc
6. 27.025 mc	†12. 27.105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

†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** Model GY-12 Cowl Mount Mobile Antenna, 2 lbs. . . \$8.95. 48" fiberglass whip. Patented rocker support for 8-point ground. Complete with 15' RG-58U cable and connector.

**B** Model CBF-1 Ground Plane Antenna, 7 lbs. \$17.95. Non-directional 1/4 wave antenna measuring 9'4" from bracket bottom to radiator top. Includes 50' RG-58AU cable and clamp.

**C** Model GDP-15, Antenna Specialists M-117 Base Station CB Antenna, 12 lbs. . . \$29.36 Super Magnum; Omni-directional full 1/2-wave radials for max. RF decoupling. Includes 50' RG-58AU cable & connectors.

**D** Model GDP-25, Antenna Specialists M-125 Rooftop Mobile Antenna, 3 lbs. . . \$15.40 Stainless steel spring; 3/8" "snap-in" mount; includes 20' RG 58/U cable & connector.

**E** Model GH-12 Microphone, 2 lbs. . . \$6.95. Push-to-talk type with tailored response for crisp communications. Complete with coiled cable, less connector.

**F** Extra Transmit & Receive Crystals, 1 lb. (specify base/mobile or handheld transceiver) . . . ea. \$2.95. Only \$1.99 with order of one or more 5-watt Transceivers.

**Special 23-Channel CB Package!** Transmit & receive crystals for all CB channels. Save \$11.59. . . .  
GWA-14-2, 1 lb., no money dn., \$8 mo. \$79.95

# Heathkit® Walkie-Talkie!



## Powerful 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

**POWERFUL, PORTABLE & DEPENDABLE!** Ready to go anywhere to provide you with efficient 2-way communications up to three miles between units . . . 5 to 10 miles when used with an external antenna or a Class "D" 5-Watt Citizen's Band Transceiver. Ready to go to work instantly to keep you in contact with the office, home, other members of your hunting or fishing party!

**MORE POWER, CLEAR RECEPTION!** The GW-52A's superhet receiver has a RF amplifier to pull in weak stations with ease. And with the adjustable squelch control and automatic noise limiter, there's virtually no annoying atmospheric noise, or ignition and electrical interference.

**COMPARE THESE EXTRA PERFORMANCE FEATURES!** For added performance and convenience, there's a heavy-duty 10-cell nickel-cadmium battery that lasts a minimum of 1500 hours (10% transmit, 90% receive) and up to 5000 hours . . . over 2 years of normal workday use! Outlasts conventional batteries many times over. And you can recharge it on 117 v. AC house current, or from your car's 12 v. battery with a special 6 foot cord which plugs into the cigarette lighter. To keep you posted on the battery's charge state, there's a built-in battery condition meter.

**LIGHTWEIGHT, COMPACT, EASY-TO-HANDLE!** It's slim, trim size and light 2½ lb. weight make for easy handling. Also includes a leather shoulder strap for easy carrying, and an elastic hand strap for a firm, comfortable grip while in use.

**RUGGED LIFETIME CABINET . . . SIMPLE TO ASSEMBLE!** With its fast, simple circuit board construction, your GW-52A goes together in a few hours. And the entire unit is attractively housed in a rustproof, 2-tone green aluminum case with a 35" chrome-plated telescopic antenna. Complete with rechargeable battery, power cords, earphone for private listening, FCC license pack (simply fill out forms & mail to get license), 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. . . . . Was \$74.95 Now \$69.95  
 Kit GW-52-2, 8 lbs. . . No money down, \$12 mo. . . . . Was \$139.95 Now \$129.95

**GW-52A SPECIFICATIONS**—Receiver: Single channel crystal controlled superheterodyne. Sensitivity: ½ microvolt for 10 db signal-to-noise ratio. Selectivity: 7 kc 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.



GW-52A  
**\$69.95**  
 (PAIR \$129.95)



### Simple Controls

Just set the volume and squelch controls to desired level, push button on side to talk, release to listen! Also shown are external antenna socket for extended range and earphone jack for private listening.



### Easy Circuit Board Assembly

All parts mount on a clearly marked circuit board. It's fast, easy and protects against wiring errors . . . assures the high stability necessary for consistently good results in all communications.



### Built-in Battery Condition Meter

Shows condition and state of battery charge when "transmit" button is pressed.



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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.

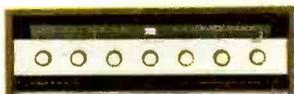
In order to produce the vast array of Heathkit equipment, a modern 205,000 sq. ft. plant (shown above) was constructed in 1958 on the shores of Lake Michigan in St. Joseph, Mich. If you are planning a visit to Michigan, we invite you to stop in and pay us a visit. We're located on Hilltop Rd. just off Business route I-94, south of St. Joseph.



## FAMOUS HEATHKIT FIRSTS

- ★ First 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



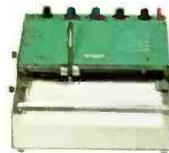
GARRARD STEREO CHANGERS



AMATEUR RADIO



MARINE ELECTRONICS



EDUCATIONAL



LAB & TEST INSTRUMENTS



HOME & HOBBY ITEMS



CITIZEN'S BAND RADIO



ELECTRONIC ORGANS

Affiliated Companies: Daystrom Ltd., Cooksville (Toronto) Canada • Daystrom Ltd., Gloucester, England • Heathkit Gerate GmbH., Spredlingen Bei Frankfurt/Main, Germany • Daystrom S.A., Geneva, Switzerland • Daystrom S.A., Zurich, Switzerland • Daystrom Overseas GmbH., Vienna, Austria



WALKIE-TALKIES



TRANSISTOR STEREO



LABORATORY INSTRUMENTS



SHIP-TO-SHORE RADIO



TEST INSTRUMENTS



PHOTOGRAPHIC ELECTRONICS

H E A T H / C O M P A N Y

Benton Harbor, Michigan

Plant Location: St. Joseph, Michigan