

*easy-to-build
electronic kits for your
construction fun*



HEATHKITS®

FOR 1958



TEST
EQUIPMENT

AMATEUR
EQUIPMENT



HI-FI
EQUIPMENT

HEATH COMPANY • BENTON HARBOR, MICHIGAN



a subsidiary of Daystrom, Inc.

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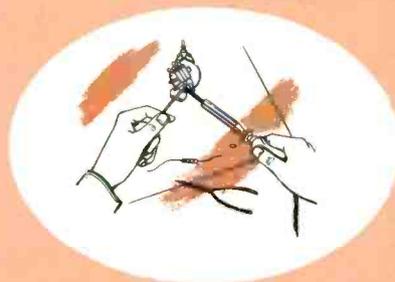
Heathkits®

are easy-to-build...



INFORMATION PACKED CONSTRUCTION MANUAL . . .

Everything you need to know is contained in this clearly written text. It has been especially designed to take you through every phase of assembly with ease, even though you may be a complete newcomer to electronics.



EXPLANATION OF PROPER SOLDERING PROCEDURE . . .

Instructions begin at the very beginning, and even illustrate and describe the proper procedure for making good solder connections. You can't go wrong if you follow the directions.

BEAUTIFUL NEW GIFT CERTIFICATES...

Now you can give Heathkits in whatever dollar value you choose . . . and the recipient of your gift can select the kits he wants for the value of the certificate. Beautifully designed, and appropriate for any occasion, this is the kind of certificate you will be proud to send to a relative or friend, and which will let them know how highly you regard them. Just send your check in the amount you desire . . . and specify the name and address of the recipient so this information can be stamped on the certificate. The gift certificate will be returned to you, in its own envelope, so you can give it, or send it, in your own special way. A fine gesture for birthdays and anniversaries, and for the special gift-giving seasons throughout the year!

*simple easy-to-understand
instructions with each Heathkit tell
you all you need to know...
guarantee your success!*



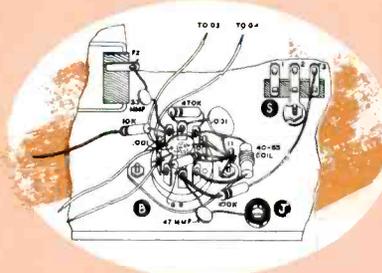
**STEP-BY-STEP
ASSEMBLY
INSTRUCTIONS . . .**

Read the step . . . perform the operation . . . and check it off—it's just that simple! These plainly-worded, easy-to-follow steps cover every assembly operation, and let you rely on our experience in kit construction.



**LEARN-BY-DOING
EXPERIENCE FOR
ALL AGES . . .**

Kit construction is not only fun—but it is educational too! You learn about radio and electronic parts and circuits as you build your own equipment . . . and this activity can make a fascinating hobby.



**EASY-TO-FOLLOW PIC-
TORIAL DIAGRAMS . . .**

You'll get plenty of these detailed pictorial diagrams in your Heathkit construction manual to show where each and every wire and part is to be placed. Everything you do is spelled out in pictures, so you can't miss!



**INSURED SUCCESS FOR
FAMILY FUN . . .**

You can be sure of successful kit construction when you buy a Heathkit because of the thought and care that goes into every construction manual, and the fine quality of the parts supplied.

GET THE KITS YOU WANT NOW... CONVENIENT TIME PAYMENT PLAN!

HIGH FIDELITY EQUIPMENT . . .

Time Payments open a complete new realm of choice for you in making up the high fidelity system of your dreams. Instead of purchasing one item at a time and having only "half" a system—you can now determine just what equipment you want in your home—and purchase the entire system at once. You can have high fidelity now—and for only 10% down!

AMATEUR RADIO GEAR . . .

Any order totaling \$90.00 or more qualifies for time payments. This means the DX-100 transmitter can be purchased with easy budget payments, or for that matter, the smaller trans-

mitters too, if combined with other items of equipment. You can have the ham station you have always wanted, and have a full year to pay.

SERVICE TEST INSTRUMENTS . . .

If you are a part-time or full-time serviceman you can benefit from the Heath Time Payment Plan. The test instruments you need to carry on your business may be had now, and they can earn money for you while their cost is distributed over twelve full months. Test equipment easily pays for itself, and you can earn enough in less than a year to more than cover the cost of a complete shop set-up of Heathkits.



By Daystrom



MODEL FM-3A

\$25⁹⁵ (with cabinet)

HIGH FIDELITY

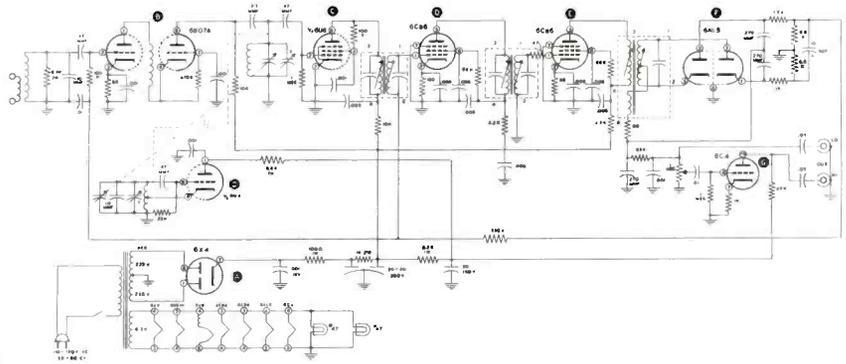
FM Tuner KIT

FEATURES

- Edge-lighted slide-rule dial for easy tuning.
- Incorporates AGC, cascode front end, temperature-compensated oscillator for stability.
- Efficient, modern circuit uses miniature tubes throughout.
- Pre-aligned IF and ratio transformers—partially pre-assembled front end—easy to build.
- Two outputs—one fixed, one variable, with extra stage of amplification.

SPECIFICATIONS

Tuning Range	88-108mc	
IF Frequency	10.7 mc	
Antenna Input Impedance	300 ohm	
Output Impedance:		
Fixed Output	47 K ohm	
Variable Output	15 K ohm	
Output Voltage: (30% modulation at 100 uv input)		
Fixed Output	0.12 volts	
Variable Output	1.5 volts	
20 db Quieting Sensitivity:	UNALIGNED	ALIGNED
88 mc	8 u volts	5 u volts
98 mc	10 u volts	8 u volts
108 mc	15 u volts	9 u volts
Tube Complement	1—6X4 rectifier	
	1—6BQ7A cascode-type RF amplifier	
	1—6U8 oscillator-mixer	
	2—6CB6 IF amplifier	
	1—6AL5 ratio detector	
	1—6C4 audio amplifier	
Power Requirement	105-125 volts 50-60 cycles AC 35 watts	
Dimensions Overall	12 ³ / ₈ " long x 3 ³ / ₄ " high x 5 ¹ / ₄ " deep	
Net Weight	5 lbs.	
Shipping Weight	8 lbs.	



The Heathkit model FM-3A Tuner is a time-proven unit that offers sensitivity, selectivity, and stability not expected at this price level, and will bring you a rich store of FM programming, your least expensive source of high fidelity material.

Its efficient, modern circuit uses 7 miniature tubes to provide better than 10 microvolts sensitivity for 20 db of quieting. A high-gain, cascode-type RF amplifier is used ahead of the tuner to increase overall gain and reduce oscillator leakage. A stage of audio amplification is also provided for more than adequate output, an added advantage since it allows operation with any amplifier system regardless of sensitivity. Two outputs are provided, one fixed and one variable so output can be controlled at the amplifier or at the tuner. Another fine feature is the ratio detector type output transformer which has the advantage of being self AM limiting, eliminating the need for two limiter stages. The limiting threshold encountered with discriminator type transformers does not have to be overcome, allowing it to pick up many more stations of listenable quality without distortion. For this reason the FM-3A although rated at only 10 microvolts sensitivity will outperform 2 and 3 microvolt tuners. Automatic gain control is provided and the oscillator circuit is stabilized through the use of special temperature-compensated condensers for positive lock-in characteristics. Steady no-drift

operation after initial warmup. The tuner has its own built-in power supply and covers the entire FM band frequency range of 88 to 108 megacycles.

One of the outstanding features of the model FM-3A is the ease with which it can be constructed, even by a beginner. The fact that the transformers are pre-aligned, and the front end unit partially pre-assembled and pre-aligned, means that stations may be tuned in as soon as the unit is completed. Then it can be "peaked up" to a received station as described in the manual for maximum sensitivity.

The wiring is accomplished by following check-off type step-by-step instructions and large, clear, pictorial diagrams. It is not necessary to read a schematic diagram. The manual even contains information on soldering techniques, tips for beginners on circuit wiring, information concerning required tools, etc. Your success is assured through Heathkit complete construction manuals.

An edge-lighted slide-rule dial is provided for easy tuning, and unit is housed in an attractive ventilated cabinet (included with the kit) it can also be mounted in a "custom" installation if desired. The FM-3A is an excellent performer using only high-quality components throughout. A worthwhile addition to any hi-fi system for years of outstanding performance. Shpg. Wt. 8 lbs.



By Daystrom

BROADBAND

AM Tuner KIT

FEATURES

- Broad band-width for greater frequency response.
- Illuminated tuning dial covers 550 to 1600 kc.
- Excellent sensitivity and selectivity.
- Power supply built in—low-noise loop antenna supplied in kit.
- Beautiful satin-gold cabinet furnished with kit.

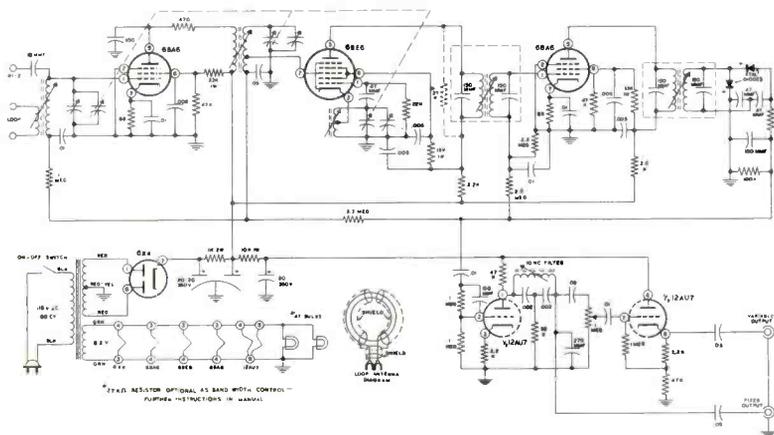


MODEL BC-1A

\$25⁹⁵ (with cabinet)

SPECIFICATIONS

Tuning Range	550-1600 kc.
IF Frequency	455 kc.
Antennae	Low impedance electrostatically shielded loop or conventional straight wire.
Outputs	Two outputs are provided, one at medium impedance fixed level, the other at low impedance from a cathode follower with variable level control.
Output Voltage	1 volt rms with 3 microvolt input up to 11 volts maximum with .1 volt input.
400 Cycle Distortion (measured with 100 uvolts signal)	At 70% modulation measured as 2.6% with 1.6% measured from the generator.
Hum and Noise	40 db below 100 uvolts 30% modulated at 400 cps.
Sensitivity for 1 volt output	Better than 3 uvolts across entire band measured from source impedances of 50 ohms or less.
Signal to Noise Ratio	Better than 12 db across entire band at rated sensitivity.
Adjacent Channel Selectivity	27 db with broad response, 29 db narrow band response.
Tube Complement	1—6X4 rectifier, 1—6BA6 RF amplifier, 1—6BE6 oscillator mixer, 1—6BA6 IF amplifier, 1—12AU7 audio amplifier-whistle filter-cathode follower output, 2 germanium diodes voltage-doubler detector.
Power Requirements	105-125 volts 50-60 cycles AC 26 watts.
Dimensions Overall	12-9/16" long x 3-5/8" high x 5-7/8" deep.
Net Weight	6 lbs. 10 oz.
Shipping Weight	8 lbs.



This exciting tuner incorporates features not usually expected in an AM circuit. Designed especially for use with high fidelity systems, the BC-1A provides broad bandwidth, and is capable of flat response from 20 cps up to 2 kc with 7 db of pre-emphasis at 9.5 kc to compensate for station rolloff above 5 kc. This pre-emphasis is employed to provide additional "brilliance" to the higher frequency sounds. Frequency coverage is from 550 to 1600 kc. RF bandwidth is 20 kc. Additional outstanding features are a 10 kc whistle filter to reduce the whistle caused by beats between the carrier tuned and an adjacent channel. 6 db signal-to-noise ratio at 2.5 uv. Pre-aligned RF and IF coils, for simplified alignment. Only three minor trimmer adjustments to make.

Most commercial AM tuners conform to a definite circuit configuration and engineering has been toward high sensitivity and selectivity but with standard bandwidth, which is rather narrow, limiting response from the tuner to 5 kc or less. In many cases, this is sufficient, since many broadcast stations limit their transmitter response to 5 kc. A large number of stations have flat response to 10 kc however, and it is impossible for one of the standard tuners to take advantage of the wider range transmission. In rare cases, full bandwidth AM to 15 kc will be found and the program material

in this case can almost be considered "hi-fi" except for the necessarily limited dynamic range. Obviously, almost all of this type of signal would be lost in a conventional tuner and the station would sound the same as one with 5 kc limited response.

The efficient, modern circuit uses miniature tubes throughout plus two crystal diodes connected in a voltage doubler circuit, which has several advantages. Audio and AVC voltage output is double that obtained with conventional types, so less audio gain is required and AVC action is substantially improved, reducing distortion and improving performance on modulation peaks. The power supply is built-in with well filtered B+. Incorporates AVC (automatic volume control)—two outputs, one fixed and one variable—two antenna inputs, one for low impedance, low-noise external loop (furnished with kit), and one for high impedance long wire.

A wide band AM tuner also is easier to tune than a conventional tuner, the response and noise quieting remain the same over a wide tuning range. This is a great help when the "uninitiated" members of the household use the system. Shpg. Wt. 8 lbs.



By Daystrom



MODEL WA-P2

\$19⁷⁵ (with cabinet)

"MASTER-CONTROL" HI-FI

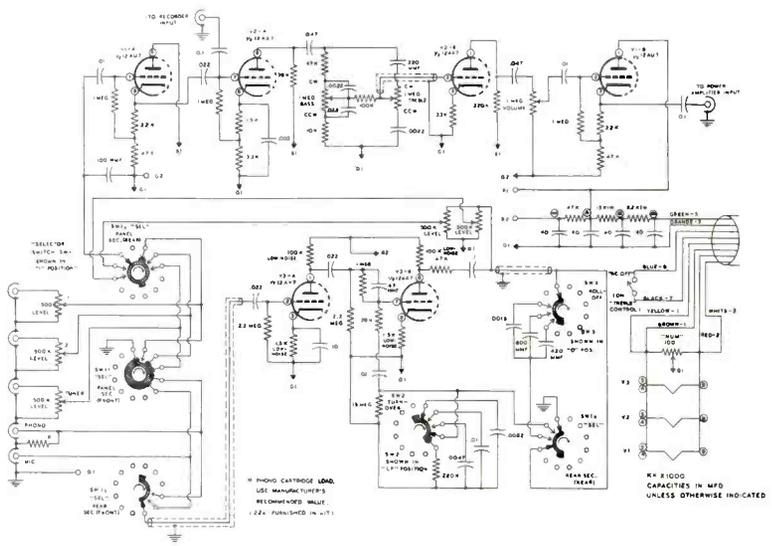
Preamplifier KIT

FEATURES

- Clean, modern lines and satin-gold enamel finish.
- 5 switch-selected inputs, each with its own level control.
- Separate bass and treble controls, special hum control.
- Equalization for LP, RIAA, AES, and early 78's.
- Real high fidelity performance for the finest audio systems.

SPECIFICATIONS

Inputs	Three high-level and two low-level inputs; individual level controls for each. High-level inputs, 1, 2 and TUNER, for 0.1 volts or higher; 0.5 megohm input impedance. Low-level inputs, PHONO and MIC, for 0.1 volts or lower; phono input impedance normally 22 K ohm for magnetic phono pickup; microphone input impedance 2.2 megohms.
Frequency Response	1.0 db from 25 cps to 30,000 cps. 1.5 db from 15 cps to 35,000 cps.
Hum and Noise	0.5 volt at TUNER input; 72 db below 2.5 volts RMS. 6 mv at PHONO input; 62 db below 2.5 volts RMS. 15 mv at MIC input; 70 db below 2.5 volts RMS.
Tone Control	Separate bass and treble tone controls. Bass control provides approximately 18 db boost and 12 db cut at 50 cps. Treble control provides approximately 15 db boost and 20 db cut at 15,000 cps.
Power Supply	Requires power from external source, as follows: 6.3 v AC at 1.0 amp.—300 v DC at 10 ma.
Dimensions	Cabinet only: 12-9/16" long, 3-3/8" high, 4-7/8" deep. Overall: 12-9/16" long, 3-5/8" high, 5-7/8" deep.
Weight	Net weight: 3-1/2 pounds. Shipping weight: 7 pounds.



In planning the purchase of a really fine hi-fi system or improving a present one, the WA-P2 should receive your serious consideration. It has many fine features that will eventually be desired. Designed to operate with the Heathkit models W-3AM, W-4AM, W-5M and W-6M amplifiers or their equivalent, this control-center provides almost infinite combinations of equalization, and compensation, with separate bass and treble tone control cut and boost action. It features five switch-selected inputs, three high-level inputs for 0.1 volts or higher at 0.5 megohm input impedance and two low-level inputs, for 0.1 volts or lower for magnetic phono pickup or microphone. Each input has its own level control to eliminate blasting or fading while switching through the various inputs, and will accommodate a record changer or player, tape recorder, AM-FM tuner, TV receiver, or microphone, etc. Provision is also made for a tape recorder output, that is not affected by the volume or tone controls so that the program material being recorded can be monitored without affecting the recording. A special hum control is provided for absolute minimum hum level. The low impedance cathode-follower output circuit allows complete installation flexibility, making the WA-P2 ideally suited for "remote" installations as output lead length is not critical.

The frequency response of this preamplifier is within $\pm 1\frac{1}{2}$ db

from 15 to 35,000 CPS. Equalization is provided for records through separate turnover and rolloff switches for LP, RIAA, AES, and early 78's. The turnover switch produces the rising low-frequency characteristics required for proper equalization since record manufacturers deliberately limit the low frequency intensity to avoid cutting into adjacent grooves. The rolloff control deemphasizes the high frequencies, removing much of the noise and scratch through four positions of 8, 12, 16 and 1 flat position. Separate tone controls, provide 18 db boost and 12 db cut at 50 CPS on bass and 15 db boost and 20 db cut at 15,000 CPS on treble. Power requirements for the WA-P2 are 6.3 volts AC at 1 ampere, and 300 volts DC at 10 ma from the basic amplifier with which it is used. Additional features include tube shielding, plastic sealed capacitors, smooth acting controls, good filtering, excellent decoupling, low hum and noise level, and an all-steel cabinet.

The WA-P2 has been carefully pre-engineered for you to insure specified high performance level. All components were especially selected for their high quality, and all values are clearly stamped to avoid mistakes. The construction manual contains complete step-by-step directions, with large pictorial diagrams that can be hung over the work area for easy reference. Successful construction is assured even for the beginner. Shpg. Wt. 7 lbs.



By Daystrom

HIGH FIDELITY

70-Watt Amplifier KIT

FEATURES

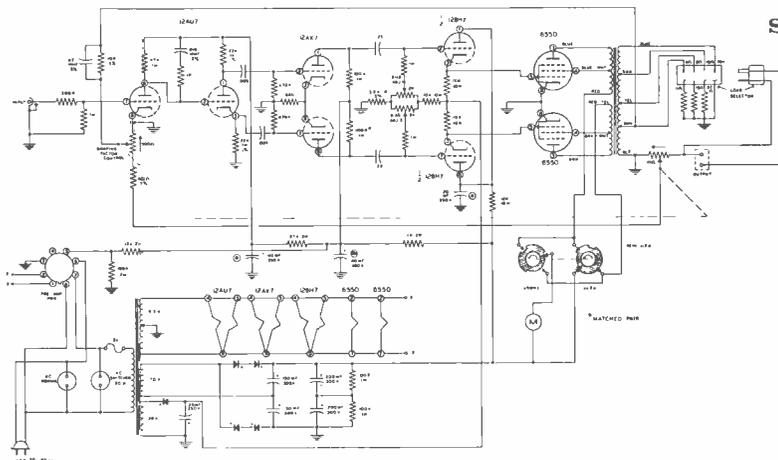
- Metered balance circuit—variable damping.
- New silicon-diode rectifiers.
- Excellent stability and power supply regulation.
- Plenty of reserve power for program material that demands it.

MODEL W-6: Consists of W-6M kit, plus WA-P2 pre-amplifier. Express only. Shpg. Wt. 59 lbs. **\$129⁷⁰**



MODEL
W-6M

\$109⁹⁵



SPECIFICATIONS

- Power Output.....70 Watts.
- Frequency Response at 1 Watt... ± 1 db 5CPS—80 KC with controlled rolloff above 100 KC.
- Harmonic Distortion at 70 Watts..... Below 2%, 20 to 20,000 CPS.
- Intermodulation Distortion at 70 Watts..... Below 1%, 60 and 6,000 CPS.
- Hum and Noise Level..... 88 db below full output.
- Damping Factor..... Variable—0.5 to —10.
- Input Voltage for 70 Watts Output.....1 volt.
- Tube Complement..... 1—12AU7, 1—12AX7, 1—12BH7, 2—6550.
- Output Transformer..... Peerless—special design. Output taps at 4, 8 and 16 ohms, and 70 volts.
- Dimensions..... 11-7/8" D. x 9-1/16" H. x 14-1/4" W.

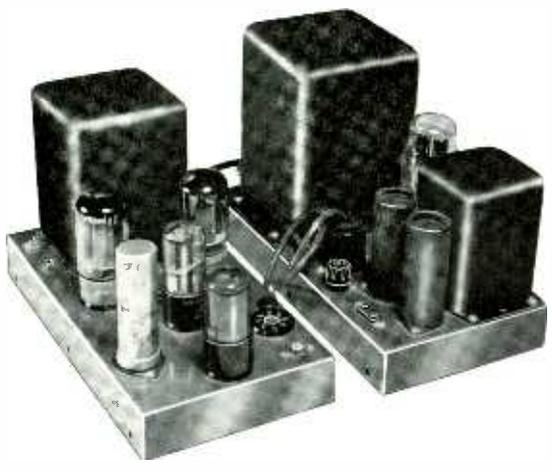
The W-6M Amplifier with its many fine design features has been enthusiastically accepted by the serious audiophile as one of the finest units available on the market. The W-6M with 70 watts output will give you truly fine performance at any power level and will drive any of the finer speaker systems available today. It will also allow you to obtain the full dynamic range of your favorite recordings or tapes. The question has often been raised, "Why do I need 70 watts?" A logical one since in many cases 10 watts may be adequate. The answer is that the present upward trend in amplifier power is necessary to keep abreast of other recent advancements in the audio art. As loudspeaker systems have been improved in bass response, their efficiencies have, in general, been reduced; this means more amplifier power for the same acoustic output from the speaker. Another important factor is the ever-increasing dynamic range of LP records and pre-recorded tapes, approaching that found in the concert hall. Even though the full rated power output may be demanded only on the loudest musical passages and transients, it is extremely important that the amplifier be capable of supplying the reserve power with negligible harmonic and intermodulation distortion.

In the design of the W-6M silicon-diode rectifiers were selected since they have no filament, to cause unnecessary heat, or burn out. They are also noted for their very long life, and yet, are smaller

than a house fuse. A heavy-duty transformer, with the latter, permits extremely good power supply regulation. The output circuit employs 6550 tubes with special-design Peerless output transformer for maximum stability at all power levels, and a variable damping control for optimum performance with any speaker system. A quick-change plug selects 4, 8, and 16 ohm or 70 volt output and the correct feedback resistance. A built-in meter indicates when output tubes are in proper balance, eliminating the need for an external meter. This meter also provides a means of spot checking from time to time to note condition of output tubes indicating whether or not best possible performance is being obtained. Attractive shield prevents tube breakage and accidental burns. Top quality components used throughout. Proper layout of chassis assures ease of assembly (by eliminating those cramped and difficult places to get at). Frequency response at 1 watt is within ± 1 db from 5 CPS to 80 kc with controlled rolloff above 100 kc. Harmonic distortion is below 2% 20 to 20,000 CPS and IM distortion is below 1% 60 and 6,000 CPS at full output assuring quiet performance. In addition to the fine specifications shown above, the W-6M is handsomely designed, making it a pleasure to display. Components used in the W-6M have generous safety margins so that they are operating well below their maximum ratings. Your assurance of years of dependable trouble-free operation. Shipped express only. Shpg. Wt. 50 lbs.



By Daystrom



\$49⁷⁵ MODEL W3-AM

DUAL-CHASSIS HI-FI
20 Watt Amplifier KIT

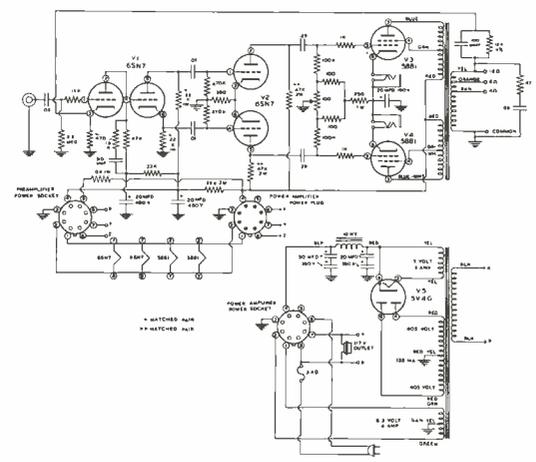
FEATURES

- Power supply and main amplifier on separate chassis for installation flexibility.
- Uses acrosound "ultra-linear" output transformer.
- Williamson-type high fidelity circuit.
- Matches speaker of your choice; 4, 8 or 16 ohms.

MODEL W-3A: Consists of W3-AM kit plus model WA-P2 pre-amplifier. Express only. Shpg. Wt. 37 lbs. **\$69⁵⁰**

SPECIFICATIONS

Power Output	20 watts.
Frequency Response	±1.5 db from 20 to 80 kc at 1 watt.
Harmonic Distortion	1% at 20 watts.
Intermodulation Distortion	1.2% at 20 watts (60 and 6000 cps, 4:1.)
Hum	85 db below 20 watts.
Damping Factor	14:1
Input Voltage for 20 watt output	0.85 volts.
Tube Complement	2-6SN7GT, 2-5881, 1-5V4G.
Output Transformer	Acrosound type TO-300.
Power Requirements	105-125 volts 50/60 cycles, 120 watts.
Overall Dimensions (each unit)	7" high by 5½" wide by 11" long.



The model W-3AM amplifier offers complete flexibility in custom installations. The power supply and amplifier stages are on separate chassis interconnected with a cable. These two units can be mounted side by side or one above the other as desired.

Employing the Williamson-type high fidelity circuit the W3-AM features the famous acrosound TO-300 "ultra-linear" output transformer and 5881 tubes for broad frequency response, low distortion, and low hum level. The result is exceptionally fine overall tone quality. Frequency response is ± 1.5 db from 20 cycles to 80 kc at 1 watt output, with controlled rolloff above 80 kc to insure complete

stability at high frequencies. Harmonic distortion is less than 1% and IM distortion is less than 1.2% at 20 watts. Hum and noise are 85 db below 20 watts. The output transformer has taps at 4, 8 or 16 ohms to match the speaker system of your choice. Top quality parts are used throughout. No technical training or electronic background is required to build one of these high fidelity units. You can experience the emotional impact of true timber response, and you have the additional satisfaction of having "built it yourself". Assemble your own Williamson-type amplifier now for real listening enjoyment. Shipped express only. Shpg. Wt. 29 lbs.



CONSULTATION DEPARTMENT

One of the "extras" you get when purchasing a Heathkit is the availability of our consultation service. Should you require additional information regarding the construction or operation of your kit, or regarding the selection of proper equipment, you can write to the Heath Company for further assistance. Our factory trained engineering consultants are specialists in their field and are thoroughly familiar with all Heathkit models and the applications to which they are suited. No charge is made for this service and when you write you will receive a prompt and personal reply. This extra service is one of the reasons why there is such a great difference between just any kit—and a Heathkit!



By Daystrom

SINGLE-CHASSIS HI-FI

20 Watt Amplifier KIT

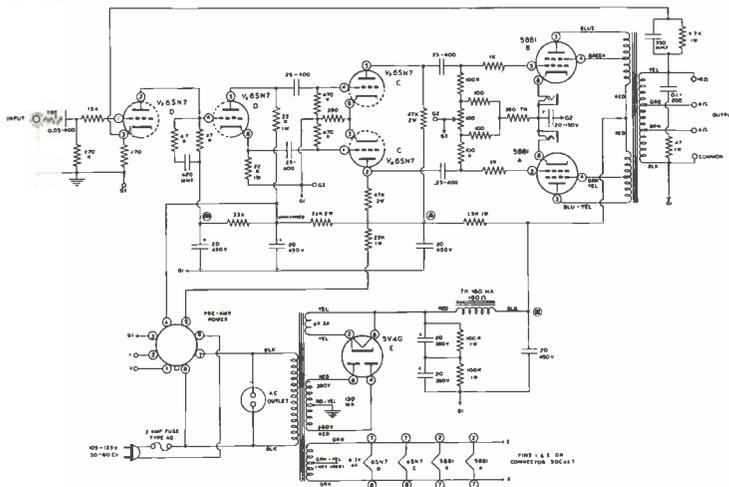
FEATURES

- True Williamson-type high fidelity circuit.
- Special-design Chicago standard output transformer.
- Transformer taps provide output impedance of 4, 8, or 16 ohms.
- Rugged, heavy duty single chassis construction.

MODEL W-4A: consists of W4-AM kit, plus model WA-P2 preamplifier. Express only. Shpg. Wt. 35 lbs. **\$59⁵⁰**



MODEL **\$39⁷⁵**
W4-AM



SPECIFICATIONS

- Power output..... 20 watts.
- Frequency Response..... ± 1 db from 10 to 100,000 cps at 1 watt.
- Harmonic Distortion..... 1.5% at 20 watts.
- Intermodulation Distortion..... 2.7% at 20 watts (60 and 3,000 cps, 4:1).
- Hum..... .95 db below 20 watts.
- Damping Factor..... 28.5:1.
- Input voltage for 30 watt output..... 2 volts.
- Tube Complement..... 2-6SN7GT, 2-5881, 1-5V4G.
- Output Transformer..... Chicago Standard, Special Design.
- Power Requirements..... 105-125 volts, 50/60 cycles, 115 watts.
- Dimensions..... 15 $\frac{1}{4}$ " by 8 $\frac{1}{2}$ " shelf space, 7" high (allow 1 $\frac{1}{2}$ " by 15 $\frac{1}{4}$ " additional shelf space for cables and connections).

Why only dream about high fidelity and the pleasure it affords—why not act! Get the model W4-AM Williamson-type amplifier which continues to amaze audio-wise people with its outstanding performance. The Williamson-type circuit, features extended frequency response, low distortion and low hum levels, this amplifier can provide you with many hours of listening enjoyment with only a minimum investment compared to other units on the market. It employs 5881 push-pull output tubes and a special Chicago Standard output transformer, designed to Heath Company specifications to give you full fidelity at minimum cost. The use of this transformer makes it possible to sell the amplifier at a bargain price, even though its performance equals that of much more expensive units. Too, some savings were realized by incorporating the power supply and the main amplifier in a single chassis.

Just read over the specifications for this fine high fidelity unit and compare them to those for amplifiers costing many dollars more. High fidelity is emphasized even though the price is unbelievably low.

Building a hi-fi system with Heathkit components is a lot of fun in itself, in fact you may get so absorbed in the construction that you lose all track of time and find yourself working into the wee hours of the morning. But, it's worth it when you listen to the results of your efforts after construction is completed. The construction manual is complete in all respects, making the amplifier suitable for construction by the beginner in electronics. The only prerequisite is ability to solder, and this can be taken care of with a little practice before

assembly is started. Complete step-by-step instructions combined with pictorial diagrams insure your success.

Another point worth considering is that Heathkit equipment is compatible with most hi-fi accessory equipment on the market, such as, turntables and various pickup cartridges, speakers, tuners, etc. You can select exactly whatever components fit your budget. Some of this equipment you may already have available, requiring only a good basic amplifier to give your system that quality touch. Frequency response extending from 10 CPS to 100,000 CPS within ± 1 db at 1 watt assures you of full coverage of the entire audible range, and clean clear sound amplification takes place in circuits that hold harmonic distortion at 1.5% and IM distortion below 2.7% at full 20 watt output. Hum and noise are 95 db below full output. Taps on the output transformer are at 4, 8 or 16 ohms to match the speaker system of your choice. Used with the Heathkit WA-P2 preamplifier, the W4-AM can be installed in an equipment cabinet or other suitable location and be controlled remotely. All accessory equipment is connected to the preamp which provides compensation, volume, and tone controls for reproduction as you like it.

A high fidelity system in your home will provide you and your family with a great deal of enjoyment and also a form of relaxation after a day at work or play. Don't deny yourself high fidelity because you feel you can't afford it. Assemble the W4-AM in just a few hours and use it with the Heathkit model WA-P2 preamplifier for many pleasant listening hours. Shipped express only. Shpg. Wt 28 lbs.



By Daystrom



\$25⁹⁵ MODEL
EA-2

AVAILABLE AFTER DEC. 1, 1957

"BOOKSHELF"

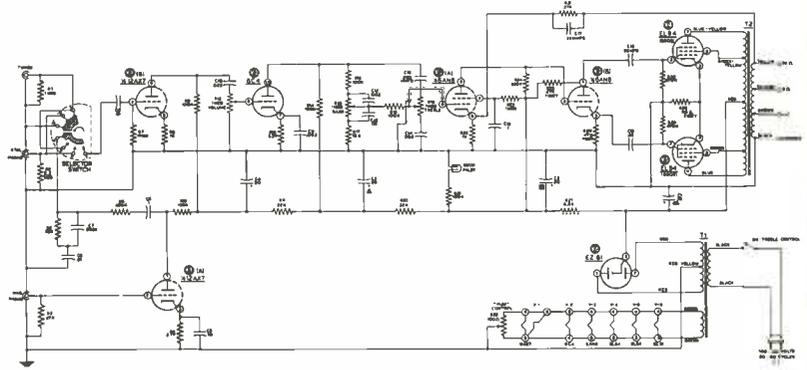
12 Watt Amplifier KIT

FEATURES

- Less than 1% distortion at full output over entire audio range (20-20KC). Amplifier conservatively rated at 12 watts.
- Full-range frequency response 20—20,000 CPS within ± 1 db at 12 watts output.
- Push-pull EL84 output tubes—special design output transformer.
- Built-in preamplifier—3 switch-selected inputs—RIAA equalization.
- Luxury-styled cabinet in black and gold.

SPECIFICATIONS

Power Output.....	12 watts.
Overall Frequency Response at 12 Watts.....	± 1 db 20 to 20 kc.
Harmonic Distortion at 12 Watts.....	1% or less @12 watts 20-20 kc.
Intermodulation Distortion at 12 Watts.....	1.5% (4:1 ratio 60 & 6,000 CPS).
Hum and Noise Level.....	47 db below 12 watts, MAG phono. 60 db below 12 watts, AUX inputs.
Input Sensitivity for 12 Watts out:	
Mag Phono.....	.005 volts at 1,000 CPS.
Crystal Phono.....	.02 volts.
Tuner.....	.02 volts.
Tone Controls:	
Bass (at 30 CPS).....	15 db boost 17 db cut.
Treble (at 15 kc).....	15 db boost 20 db cut.
Tube Complement.....	1-12AX7, 1-6C4, 1-6AN8, 2-EL84, 1-EZ81.
Power Supply.....	Transformer operated.
Power Requirements.....	117V, 60 cycle AC, 100 watts.
Dimensions.....	12½" W. x 8¾" D. x 4¾" H.
Shipping Weight.....	15 pounds.



Here is a strikingly attractive 12-watt hi-fi amplifier that you will want for your living room or den. Its good looks and compact dimensions make it suitable for use in the open on a bookcase, or on an end table. Tubes, transformers, and the circuit components are out of sight, within its attractively styled cabinet—and all operating controls are conveniently located on the front panel. But, this eye-pleasing style and color are not the whole story. You get many hidden "extras" in circuit design, which are normally taken for granted, but which have everything to do with the high quality of sound reproduction obtained.

This amplifier takes advantage of the most recent developments in the audio art to give you full range frequency response from 20 to 20,000 CPS within ± 1 db. Harmonic distortion is less than 1% at full 12 watts output over the entire range (20—20,000 CPS). Intermodulation distortion is less than 1.5% at 12 watts, with low hum and noise.

The advanced circuitry incorporated uses miniature tubes throughout including EL84 output tubes in a push-pull tapped-screen output circuit using a special design output transformer. The output transformer is tapped at 4, 8 and 16 ohms to match almost any speaker system.

The model EA-2 has its own built-in preamplifier with provision for three separate inputs, MAG phono, crystal phono, and tuner. The MAG phono input features RIAA equalization and crystal phono input impedance is 2.2 megohm to meet the rating recommended by most cartridge manufacturers. Separate bass and treble tone

controls are provided with boost and cut action. A special hum-balance control is also provided to insure quiet operation.

Construction of the EA-2 is simplified through the flat chassis layout which eliminates those cramped and difficult places to get at. The instruction manual supplied has plenty of pictorial diagrams in addition to the step-by-step instructions which tell you exactly where each and every part goes. Parts are clearly marked so that they are easily identified.

The cabinet shell is well ventilated to allow cooling and is constructed of vinyl plastic bonded to steel which is practically indestructible. It resists scuffing, wear, and abrasion. Resists chemicals so it won't stain. Heat or flame will not cause it to blister or peel. Wipes clean in seconds with a damp cloth. The bond will not loosen even under extreme pressure. The vinyl coating has a smooth leather texture in black with tiny flecks of inlaid gold to add an extra luxury touch. The front panel features brushed-gold trim and buff knobs with gold inserts. Control and function are clearly indicated with gold lettering. An amber neon pilot lamp is also provided to indicate when the amplifier is on.

Design of the amplifier also allows mounting in an equipment cabinet if desired. A full size template is supplied.

In all, here is an amplifier that not only looks good but has built-in performance comparable to amplifiers costing many times more. It is an amplifier that you and your family will be proud to own and use. Shpg. Wt. 15 lbs.



By Daystrom

Audio Generator KIT

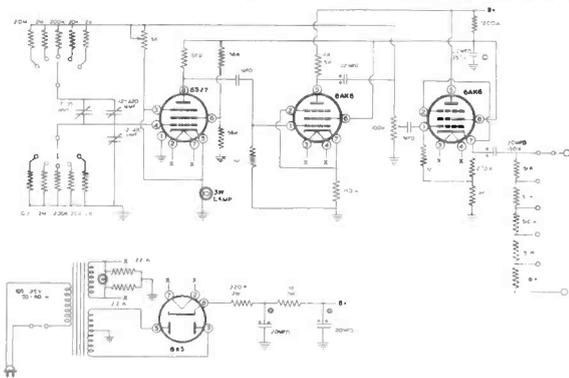
FEATURES

- Continuous coverage, any frequency between 20 CPS and 1 MC.
- Output voltage controlled with step and variable attenuators.
- Precision resistors in frequency determining network.
- Cathode follower output for stability and low impedance.
- Well regulated output with very low distortion.



MODEL
AG-8

\$29⁵⁰



High fidelity fans and service technicians will welcome this low-cost, highly-efficient audio generator kit, for evaluating and servicing audio amplifiers. Its constant output voltage and wide frequency range are mighty important when plotting audio response curves. Continuous frequency coverage from 20 CPS to 1 mc is available in five ranges. Tuning is greatly simplified by means of a five-position range switch and a fine adjustment to the panel scale markings. Output voltage is controlled with a step-type attenuator and a continuously variable control. Maximum output impedance is 600 ohms, and overall distortion is less than .4 of 1% from 100 CPS through the

SPECIFICATIONS

Frequency	20 cps to 1 mc in 5 ranges.
Output	10 volts (no load) \pm 1 db 20 cps-400 kc -3 db at 600 kc; -8 db at 1 mc.
Impedance	600 ohm output.
Distortion	Less than 0.4%, 100 cps through audible range.
Power	105-125 volts AC, 50-60 cycles, 30 watts.
Dimensions	7½" high, 13¼" wide, 7½" deep.

audible range. Up to 10 volts of audio output is available, under no-load conditions. Output remains constant within \pm 1 db from 20 CPS to 400 kc. The power supply is transformer operated with well regulated output and low distortion. Precision resistors are used in the frequency determining network for accuracy. The model AG-8 can be built in a very few hours by following the clearly designed instructions. After construction, the generator is easily calibrated using only a VTVM or any reasonably high impedance AC voltmeter. Full instructions are provided for the use of the 60 cycle AC line as an accurate frequency source. Shpg. Wt. 11 lbs.

HEATHKIT

Audio Oscillator KIT

(Sine and Square Wave)

The AO-1 Audio Oscillator features either sine wave or square wave output, with audio frequency coverage of 20 CPS to 20,000 CPS in three ranges. Thermister regulation is provided for linear output throughout the frequency range. AF output is at low impedance, with low distortion. Good sine waves, and clean square waves with a rise time of only 2 microseconds are available to be used in a great variety of applications. Output voltage is 10 volts no-load, \pm 1 db. Distortion is less than 0.6% from 100 CPS through the audible range. Cabinet measures 7½" H. x 13¼" W. x 7½" D. A very valuable instrument for audio experimentation and development work. Shpg. Wt. 10 lbs.



MODEL AO-1

\$24⁵⁰

HEATHKIT SQUARE WAVE

Generator KIT

The model SQ-1 Square Wave Generator provides an excellent method for studying amplifier distortion, high and low frequency response, phase shift characteristics, and transient response. Features wide frequency range, good square wave output and high output voltage at low impedance. Output frequency is variable from 10 CPS to 100 kc in four ranges, and the output voltage level is variable from 0 to 20 volts. A cathode follower output is used for isolation. Cabinet measures 12½" L. x 7" H. x 7½" D. Designed for ease of assembly and will provide many years of reliable service. An outstanding instrument at this low price. Shpg. Wt. 12 lbs.



MODEL SQ-1

\$29⁵⁰



\$49⁹⁵ MODEL
AA-1



By Daystrom

Audio Analyzer KIT

FEATURES

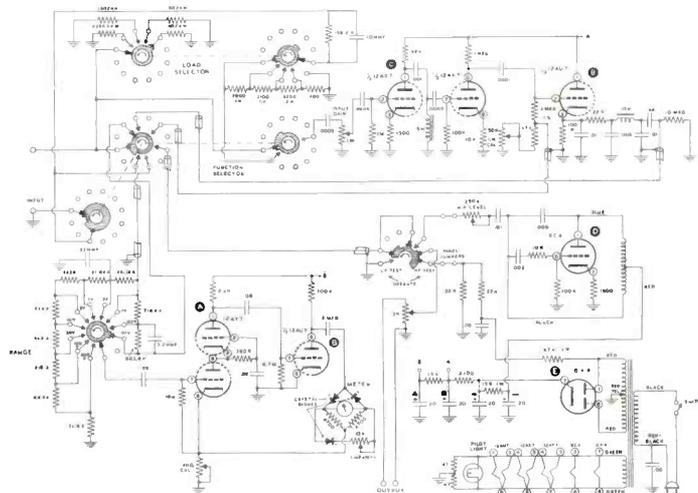
- Combines function of AC-VTVM, wattmeter, and IM analyzer in one compact unit.
- High and low frequency oscillators built-in for IM tests.
- Built in load resistors of 4, 8, 16 and 600 ohms.
- Large easy-to-read meter—flexible switching system simplifies operation.
- Tremendous savings over purchase of 3 separate instruments.

SPECIFICATIONS

Frequency Response:	
AC VTVM	10 cycles to 100 kc \pm 1 db.
Wattmeter	10 cycles to 50 kc \pm 1 db.
IM Analyzer High Pass Filter	2000 cps to 12000 cps.
IM Analyzer Low Pass Filter	10 cps to 600 cps
Range:	
AC VTVM	0.01, 0.03, 0.1, 0.3, 1, 3, 10, 30, 100, 300 V. RMS full scale.
DBM	-40, -30, -20, -10, 0, +10, +20, +30, +40, +50. Reads from -65 to +52 DBM.
Wattmeter	15 mw, 1.5 mw, 150 mw, 1.5 w, 15 w, 150 w full scale. Maximum continuous power 25 watts, intermittent power to 50 watts.
IM Analyzer	1%, 3%, 10%, 30%, 100% full scale.
Input Impedance:	
AC VTVM	1 megohm or 4, 8, 16 or 600 ohms switch selected.
IM Analyzer	1 megohm or 4, 8, 16, or 600 ohms, switch selected.
Wattmeter	4, 8, 16 or 600 ohms internal load, 10,000 ohms across ext. load.
Output Impedance:	
Low and High Frequency	
Output	3000 ohms. (600 ohms when shunted with a 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.
IM Analyzer	Within 10% of full scale.
Power Requirements	105-125 VAC, 50-60 cycles, 20 watts.
Dimensions	13" wide x 8½" high x 7" deep.
Net Weight	9 lbs.
Shipping Weight	13 lbs.

The model AA-1 Audio Analyzer is almost a complete laboratory in itself, in that it combines the function of an AC VTVM, a wattmeter, and an IM analyzer. Combining these instruments into one compact package allows making a very thorough analysis of audio equipment without the necessity of cluttering the work bench with various instruments and sometimes a bewildering number of test leads. Power output, noise, gain, overload and intermodulation characteristics can be determined quickly and accurately using the two sets of test leads furnished and the flexible switching system incorporated in the analyzer. Non-inductive load impedances of 4, 8, 16 and 600 ohms are built-in and are switch-selected for the desired resistance. A high impedance position is also provided for stage-to-stage and other high impedance circuit analysis.

Unique circuitry is used in the AC VTVM portion of this instrument to secure improved performance. Employs a cascode type input stage for high gain at low noise levels, thus improving meter accuracy at all voltage readings. The VTVM circuit can be used for



measuring noise, frequency response, output, gain, power supply ripple, etc. The built-in wattmeter allows simple measurement of power output with either internal or external loads. DBM scales are also provided so that the db gain or loss may be noted quickly. Circuit and meter ballistics are such that the instrument makes an excellent level monitor for recording and program feed purposes. High and low frequency generators for IM measurements are built in so that no additional equipment is necessary for intermodulation distortion testing. IM tests may be made at the amplifier output, or at individual high impedance stages.

All basic operations of the instrument can be accomplished by connecting the output leads to an amplifier input, and the input leads to the amplifier output, and rotating the function selector switch through all of the available positions. A glance at the specifications will quickly show the many functions and features available. The tremendous popularity of this instrument has made a price reduction of almost ten dollars possible, on top of the substantial saving over the purchase of three separate instruments.

The careful design of this instrument allows a maximum in performance, flexibility and utility. High quality components are clearly marked for easy identification. The instruction manual contains a complete circuit description plus information on its use and applications. The AA-1 is attractively styled with all functions of the controls clearly indicated. If you are active in the design or repair of audio equipment you will find the AA-1 a welcome friend indeed. Shpg. Wt. 13 lbs.



By Daystrom

Audio Generator KIT

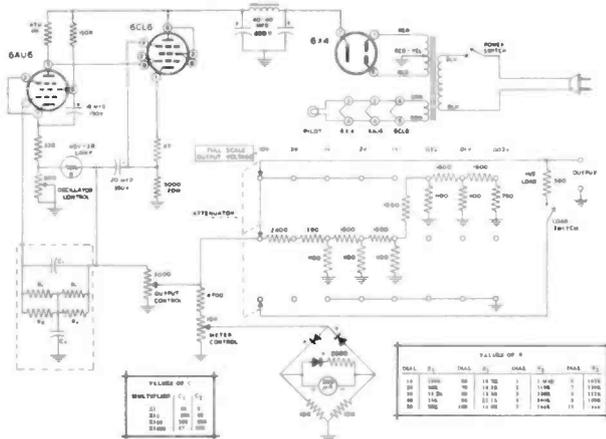
FEATURES

- Output and frequency indicators accurate to within $\pm 5\%$.
- Built-in 600 ohm load, switch selected.
- All frequencies tuned by switch method—no human tuning error to consider.
- 200 microampere meter calibrated in volts RMS and DB.
- Attenuation both continuous and in calibrated steps.



MODEL
AG-9A

\$34⁵⁰



Attention hi-fi perfectionists! This is what you've been looking for; a small, compact audio generator that produces a near perfect sine wave with close frequency control and metered output voltage.

The model AG-9A provides quick and accurate selection of low-distortion signals throughout the audio range. Three rotary switches select two significant figures and a multiplier to determine audio frequency. Switch selection of frequencies allows return to the exact frequency previously measured, without error as might be encountered with continuously variable tuning. Frequency can be varied in increments of 1 CPS from 10 to 100 CPS. A four-position multiplier

SPECIFICATIONS

- Frequency** 10 cps to 100 kc, switch selected, 2 significant figures and multiplier.
- Output** 6 ranges 0-.003, .01, .03, .1, .3, 1 volts RMS into external 600 ohm load or with Internal load into Hi-Z.
2 ranges 0-3, 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-600 ohms).
- Distortion** Less than .1% 20-20,000 cps.
- Tubes** 1-6AU6, 1-6CL6, 1-6X4.
- Power** 105-125 volts AC, 50-60 cycles, 40 watts.
- Dimensions** 9½" wide, 6½" high, 5" deep.

switch increases this range in multiples of 10, thus providing the overall range of 10 to 100,000 CPS. The attenuator system operates in sets of 10 db and is also calibrated in 8 full scale meter ranges of 0-.003, .01, .03, .1, .3, 1, 3, and 10 volts RMS. Output is indicated on a large 4½" panel meter calibrated in volts and decibels. Output and frequency indicators are accurate to within $\pm 5\%$. Distortion is actually less than .1 of 1% between 20 and 20,000 CPS. With the AG-9A as a signal source you can forget about unknown input variations and distortion when working with audio circuits. Use it with the HD-1 kit to check harmonic distortion. Shpg. Wt. 8 lbs.



MODEL
HD-1

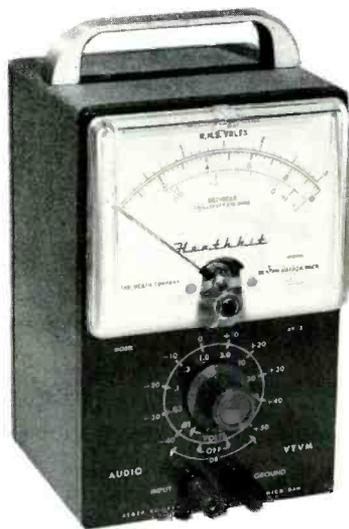
\$49⁵⁰

HEATHKIT

Harmonic Distortion Meter KIT

The Heathkit Harmonic Distortion Meter, model HD-1 will prove invaluable in the designing and servicing of audio circuits. Used with an audio signal generator, the HD-1 will accurately measure harmonic distortion at any or all frequencies between 20 and 20,000 CPS. Distortion is read directly from the panel meter in ranges of 0-1, 3, 10, 30 and 100% full scale. Full scale voltage ranges of 0-1, 3, 10 and 30 volts are provided for the initial reference settings. Signal-to-noise ratio measurements are also permitted through the use of a separate meter scale calibrated in db.

The HD-1 kit features top-quality components throughout. High input impedance (300,000 ohms) and 1% precision resistors in the VTVM voltage divider circuit assure excellent sensitivity and accuracy. In spite of the lab type circuit involved, the Heathkit Harmonic Distortion Meter is quite simple to construct and use. Measures 13" W x 8½" H x 7" D. This kit is complete in all respects. After construction it will prove its worth by long years of outstanding service. Shpg. Wt. 13 lbs.



\$29⁹⁵ **MODEL
AV-3**



By Daystrom

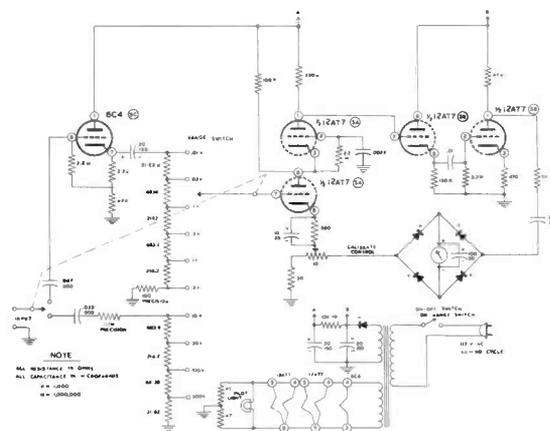
Audio VTVM KIT

FEATURES

- Essentially flat response from 10 CPS to 400,000 CPS.
- Precision 1% voltage divider resistors.
- Large, easy-to-read 4½" 200 UA meter.
- Measures AC signals from 1 MV to 300 V at high impedance.
- Stable, reliable performance in all applications.

SPECIFICATIONS

Frequency Response:	± 1 db 10 CPS to 400 kc.
Sensitivity:	10 millivolts full scale (lowest range).
Range:	volts 0.01, 0.03, 0.1, 0.3, 1, 3, 10, 30, 100, 300, volts, RMS, full scale. decibels total range -52 db to +52 db, scale -12 to +2 db (1 mw -600 ohm) ten switch selected ranges from -40 to +50 db.
Input Impedance:	1 megohm at 1 kc.
Accuracy:	within 5% of full scale.
Multipliers:	1% precision type.
Meter:	4½" streamlined case with 200 microampere movement.
Tube Complement:	2-12AT7, 1-6C4.
Power Supply:	Selenium rectifier with resistance-capacitance filter.
Power requirements:	105-125V AC, 50-60 cycles, 10 watts.
Dimensions:	7¾" high x 4½" wide x 4¼" deep.
Net Weight:	3½ Lbs.
Shipping Weight:	5 Lbs.



The model AV-3 AC Vacuum Tube Voltmeter was designed especially for audio measurements, and for use in making low-level AC measurements in power supply filters, etc. This voltmeter emphasizes stability, broad frequency response, and sensitivity. It employs a tried and proven circuit featuring a cascode amplifier with cathode-follower isolation between the input and the amplifier, and between the output stage and the preceding stages. An extremely stable circuit with high input impedance (1 megohm at 1000 CPS). The frequency response of the model AV-3 is essentially flat from 10 CPS to 400 kc, and is usable for tests well beyond these frequency limits. Features large, easy-to-read 4½" 200 ua meter. Increased damping

in the meter circuit stabilizes the meter for low frequency tests. Nylon insulating bushings at the input terminals reduce leakage and permit the use of the convenient five-way Heath binding post. The extremely wide voltage range covered by the AV-3 makes it especially valuable not only in high fidelity service, but also in experimental laboratories. AC (RMS) voltage ranges are 0-.01, .03, .1, .3, 1, 3, 10, 30, 100 and 300 volts. Db ranges cover -52 db to +52 db. 1% precision resistors are used for maximum accuracy. The neat, compact, circuit layout assures ease of assembly. The AV-3 is most attractive in appearance and is a pleasure to use with stable, reliable performance in all applications. Shpg. Wt. 5 lbs.

HEATHKIT

Audio Wattmeter KIT

The AW-1 Audio Wattmeter can be used in any application where audio power output is to be measured. External or internal load resistors are selected with convenient front panel switch. Non-inductive load resistors are built in for 4, 8, 16 or 600 ohms impedance. Five power ranges cover 0-5 mw, 50 mw, 500 mw, 5 w and 50 w full scale. Five switch-selected db ranges cover -10 db to +30 db. All indications are read directly on the large 4½" 200 microampere meter. Frequency response is ± 1 db from 10 CPS to 250 kc.

Precision multiplier resistors are used for high accuracy, and crystal diode bridge for wide-range frequency response. Uses a 12AU7 voltage and current amplifier for meter, and is operated from a transformer-type power supply. Measures 7¾" H. x 4¾" W. x 4½" D. Operates from 105-125 V. AC, 50-60 cycle power. A fine meter to help supply the answers to your audio operating or power output problems. Also features modern physical styling and convenient functional front panel design. Shpg. Wt. 6 lbs.



**MODEL
AW-1** **\$29⁵⁰**



By Daystrom

SINE-SQUARE

Generator KIT

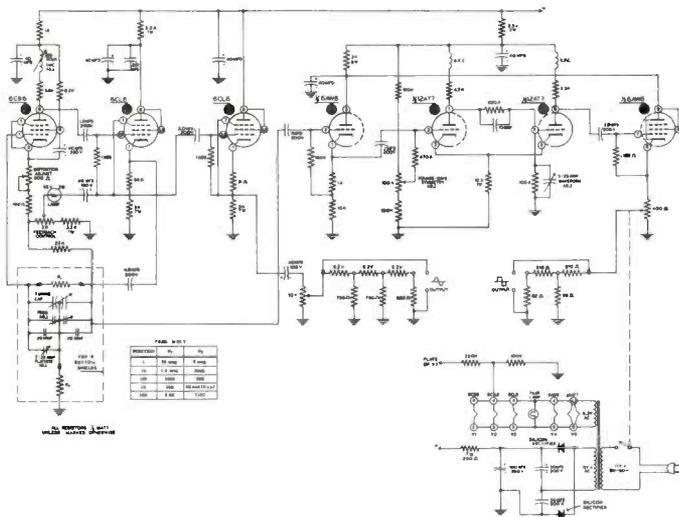
FEATURES

- Sine and square wave output available simultaneously at separate terminals.
- Continuous coverage ± 1.5 db from 20 cps to 1 mc on both sine and square waves.
- Low distortion (less than .25%)—square wave rise time .15 microseconds.
- Constant output impedance at all settings of output controls (except in 10 V ranges).



MODEL
AG-10

\$49⁹⁵



SPECIFICATIONS

- Sine Wave:**
- Frequency Range 20 cycles—1 MC
 - Output Volts (R. M. S.) 0-10 volts, 0-1 volt, 0-.1 volt, 0-.01 volt into a High Impedance Load
 - Source Impedance ($\pm 10\%$) 10 volt range—0 to 3.5 k ohm; 1 V, .1 V, and .01 V range—600 ohm
 - Distortion less than .25% 20 to 20,000 cycles
 - Frequency Response ± 1.5 db 20 cycles to 1 megacycle
- Square Wave:**
- Frequency Range 20 cycles—1 MC
 - Output Volts (P. to P.) $\pm 5\%$ 0-10 volt, 0-1 volt, 0-.1 volt, into a High Impedance Load
 - Source Impedance ($\pm 10\%$) 10 volt range—0 to 220 ohm 1 V, and .1 V ranges—52 ohm
 - Rise Time less than .15 micro-second
- General:**
- Frequency Accuracy $\pm 5\%$
 - Power Requirements 105-125 V.A.C., 50-60 cycles 55 watts
 - Dimensions 13" wide x 8½" high x 7" deep

The AG-10 is one of the newest generator additions to the Heath line. It is a general purpose lab instrument, featuring wide range, high quality, sine and square waves, for a great variety of applications. Some of these are; radio and TV repair work, checking scope performance, as a variable trigger source for telemetering and pulse work, and checking audio, video and hi-fi amplifier response.

The frequency response of the AG-10 is ± 1.5 db from 20 CPS to 1 MC on both sine and square waves, with less than .25% sine wave distortion, 20 to 20,000 CPS. The sine wave output impedance is 600 ohms at all settings of the output controls (except in 10 volt range). The square wave output impedance is 50 ohms at all settings (except in 10 volt range). Square wave rise time is less than .15 microseconds.

An added feature of this generator is the addition of a control in the oscillator circuits to adjust for differences in tube characteristics assuring absolute minimum distortion. A new and more exact frequency calibrating system is employed to insure proper tracking across the dial. The wide frequency range and high quality waveforms will make this instrument extremely useful in general laboratory use as well as in audio, television, and high fidelity applications. Separate output terminals are provided for sine and square wave output so that both the sine and square waves can be used at the same time with no detrimental effects to either waveform. In making stage-gain measurements, the sine wave output can be connected to the input of a stage to be measured, and the square wave output connected to the external sync terminal of an oscilloscope. By using this method of sync, measurements can be made all the way through

a number of amplifier stages without having to readjust the oscilloscope synchronizing controls.

Features include a five-position band switch with steps of x 1, x 10, x 100, x 1k, and x 10 k—continuously variable tuning—shielded oscillator circuit—separate step and variable output attenuators in ranges of 10, 1, and .1 volts for both sine and square wave, with extra range of .01 volt on sine wave. Smooth acting controls eliminate amplitude bounce.

The well-filtered power supply uses silicon-diode rectifiers and a husky power transformer. An output cable is supplied with provisions for proper termination as outlined in the manual. All functions of the controls are clearly indicated on the attractively screened front panel making operation of the controls self-explanatory. The front panel controls are divided into three groups. On the extreme left and right under the square wave and sine wave drawn on the panel are the controls and output terminals for the square wave and sine wave outputs. In the center are the frequency and frequency multiplier controls common to both sine and square waves.

The interior layout was designed for maximum efficiency and ease of construction. High quality components are used throughout and are clearly marked for easy identification. The construction manual supplied has detailed step-by-step instructions, large pictorial diagrams and all other necessary information for successful assembly with additional information on circuit description and use of the completed instrument. We are sure you'll agree that its performance is unmatched at this price level. Shpg. Wt. 12 lbs.



\$69⁵⁰

**MODEL
O-11**



By Daystrom

"EXTRA DUTY"

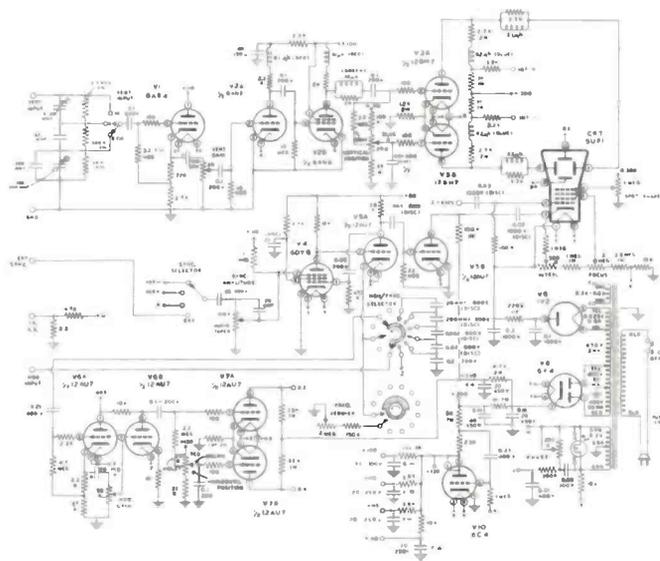
5" Oscilloscope KIT

FEATURES

- Full 5 MC bandwidth for color TV servicing.
- Heath patented sweep circuit provides 20 to 500,000 CPS sweep (5 times the range usually provided).
- 2 printed circuit boards for faster, easier assembly and stability.
- Excellent linearity and sync stability—push-pull output—peak-to-peak calibration reference.

SPECIFICATIONS

Vertical Channel:	
Sensitivity	0.025 V (RMS) per inch at 1 kc.
Frequency Response	Flat within ± 1 db from 8 cps to 2.5 mc. Flat ± 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.
Overshoot	10% or less.
Input Impedance	X1—21 mmf across 2.9 megohms, (1 kc impedance, 2.7 megohms).
Horizontal Channel:	
Sensitivity	0.6 V. (RMS) per inch at 1 kc.
Frequency Response	Flat within ± 1 db 1 cps to 200 kc Flat within ± 3 db 1 cps to 400 kc.
Input Impedance	31 mmf across 30 megohms (1 kc impedance, 4.9 megohms).
Sweep Generator:	
Range	20 cps to 500 kc in 5 steps: 20—100 cps, 100 cps—1 kc, 1 kc—10 kc, 10 kc—100 kc, 100 kc—500 kc.
Synchronizing	External positive or negative signal internally, or from line.
Tube Complement	1—5U1, 1—6AB4, 1—6AN8, 1—12BH7, 1—6DT6, 3—12AU7, 1—6X4, 1—1V2, 1—6C4.
Power Requirements	105 - 125 volts, 50-60 cycles at 80 watts.
Dimensions	8 $\frac{3}{4}$ " wide x 14 $\frac{1}{4}$ " high x 16" deep.
Net Weight	20 $\frac{1}{2}$ pounds.
Shipping Weight	22 lbs.



Here is our very finest scope! The advanced design and performance characteristics of the O-11 make it a professional piece of equipment.

It features wide band amplifiers which are essential for color TV servicing, and for critical observations in the electronic laboratory. Vertical frequency response extends from 3 CPS to 5 MC plus 1.5 db minus 5 db without extra switching. The response is down only 2.2 db at 3.58 MC. The sweep circuit functions effectively from 20 CPS to better than 500 KC in five steps, utilizing the Heath patented sweep circuit, which gives you five times the usual sweep obtained in other scopes. Another extra, developed by Heath engineers, giving you the latest in circuit design. Amazing linearity and lock-in characteristics enables viewing of a single wave, even at upper frequency limits. Both vertical and horizontal output amplifiers are push-pull and the scope incorporates a peak-to-peak calibrating source. The input to the vertical amplifier has a three-step frequency compensated input attenuator. Numerous other features include plastic molded capacitors in all coupling and bypass applications—preformed and cabled wiring harness—low capacity nylon insulated bushings for the vertical and horizontal input terminal posts, and other top-quality parts throughout.

The 11-tube circuit features a 5U1 cathode ray tube, and provision is made for Z-axis input for intensity modulation of beam. The extremely short retrace time and efficient blanking action provides "picture book" display of essential TV wave forms. Positive trace

position controls with no bounce or overshoot. Frequency response of the horizontal amplifier is within 1 db from 1 CPS to 200 KC and down only 3 db at 400 KC. Horizontal sensitivity is 0.6 volts RMS per inch. Construction is simplified through the use of two etched metal circuit boards, and preformed, cabled wiring harness which imparts a professional appearance to the oscilloscope wiring. In addition, use of etched circuits reduces assembly time, and provides a firm mounting for all standard components soldered to the circuit board. Wiring errors are virtually eliminated since all parts are mounted individually, with each space clearly marked. Etched metal circuit boards permit stability levels difficult to obtain in conventionally wired circuits. Stray capacities and RF fields are safely controlled to eliminate undesirable effects.

The construction manual features schematics and pictorial diagrams and complete step-by-step instructions plus large size pictorials which can be pinned up over your work bench for easy reference. In addition to being an outstanding performer, the model O-11 is the kind of professional-looking instrument you will be proud to display on your workbench. The panel is charcoal gray in color, with "high contrast" white lettering. The panel is readable even under subdued lighting conditions often required for oscilloscope operation. Test leads and a calibrated grid screen are provided with kit. Heath know-how in producing kit-form instruments assures you of the best dollar value in performance. Shpg. Wt. 22 lbs.



By Daystrom

“GENERAL PURPOSE”

5" Oscilloscope KIT

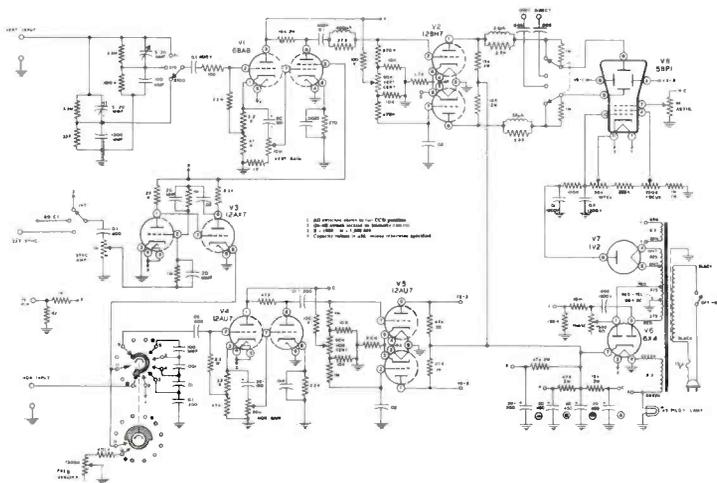
FEATURES

- Push-pull horizontal and vertical amplifiers.
- Modern etched circuit design for stability.
- Built-in IV peak-to-peak calibration reference.
- Full 5" cathode ray tube—Spot shape control.
- Easy to build from complete instructions supplied.



MODEL
OM - 2

\$42⁵⁰



SPECIFICATIONS

Vertical:	
Rise Time	0.25 microseconds.
Frequency Response	± 3 DB 4 cps to 1.2 megacycle. ± 6 DB 3 cps to 2 megacycle.
Sensitivity	0.09 RMS volts per inch at 1 kc.
Input Impedance	35 uufd shunting 1.5 megohms at X1. 25 uufd shunting 1.5 megohms at X10 & X100.
Horizontal:	
Frequency Response	± 3 DB 2 cps to 425 kc. ± 6 DB 1 cps to 650 kc.
Sensitivity	0.275 RMS volts per inch at 1 kc.
Input Impedance	25 uufd shunting 10 megohms.
Sweep Generator	Multivibrator 20 cps to over 150 kc.
Tube Complement	1—5BP1 cathode ray tube. 2—12AU7 horizontal cathode follower and amplifier. Horizontal deflection amplifier. 1—12BH7 vertical deflection amplifier. 1—6BA8 vertical cathode follower and amplifier. 1—12AX7 sweep multivibrator. 1—6X4 low voltage rectifier. 1—1V2 high voltage rectifier.
Power Requirements	105-125 volts AC, 50/60 cycles, 65 watts.
Dimensions	8 3/4" wide x 14 1/4" high x 18" deep.
Net Weight	18 lbs.
Shipping Weight	22 lbs.

If you are looking for an "exceptional buy" in an oscilloscope for general purpose applications, look at the features offered by the OM-2!

This fine scope features wide vertical amplifier frequency response, extended sweep generator operation, and improved stability. The frequency response of the vertical amplifier has been extended to within ±3 db from 4 cps to 1.2 mc, or ±6 db, from 3 cps to 2 mc. Vertical sensitivity is .09 VRMS per inch at 1 kc. The improved sweep generator functions reliably from 20 cps to over 150 kc. Modern etched circuit boards are featured in critical parts of the oscilloscope circuit. They not only permit a level of high stability but also reduce assembly time considerably. Standard components are mounted on these boards with each position clearly marked preventing wiring errors. Both vertical and horizontal amplifiers are

push-pull types. This scope features a 5BP1 CRT, with provision for external or internal sweep and sync, a built in IV peak-to-peak reference voltage for calibration purposes, and a calibrated grid screen. The input to the vertical amplifier is through a three position step-attenuated, frequency compensated circuit, allowing control of signal levels applied to the amplifier. An adjustable astigmatism (spot shape) control is provided to insure a sharp trace.

This scope is excellent for servicing, for use in the ham shack, or for routine laboratory work. It is especially valuable for students, or hobbyists. Designed to provide maximum performance at a minimum price, the model OM-2 fulfills the need for a high-quality general purpose instrument. In all, this oscilloscope incorporates many "extras" definitely not expected at this price level. It's an instrument you will be proud to own and use. Shpg. Wt. 22 lbs.

HEATHKIT ETCHED CIRCUIT SCOPE DEMODULATOR

Probe KIT



NO. 337 - C **\$3⁵⁰**

Extend the usefulness of your oscilloscope by observing modulation envelope or RF or IF carriers in TV and radio receivers. Functions like AM detector to pass only modulation of signal and not signal itself. Voltage limits are 30 V. RMS and 500 V. DC. Shipping Wt. 1 lb.

HEATHKIT LOW CAPACITY

Probe KIT



NO. 342
\$3⁵⁰

Oscilloscope investigation of circuits encountered in television work requires the use of a special low capacity probe to prevent loss of gain, circuit loading or distortion. This probe features a variable capacitor to provide correct instrument impedance matching. Also, the ratio of attenuation may be varied. Shipping Wt. 1 lb.



USE THIS HANDY ENVELOPE WHEN ORDERING

Fold, enclose order blank with remittance
seal, stamp and mail.

PLACE
STAMP
HERE

HEATH COMPANY
BENTON HARBOR, MICHIGAN

NAME _____
ADDRESS _____
CITY & STATE _____

- BEFORE SEALING...**
- Have you:*
- a) Filled out order blank completely?
 - b) Included postage with remittance on cash order?
 - c) Completed credit form for time payment order?

HEATHKIT Volta

The model VC-31
wave signals of
the amplitude of

Employs precise
vibrator circuit
1000 CPS. Output
0.3, 1.0, 3.0, 10, 30
provided so that you
annoying lead check
checking audio &
valuable bench s

INCLUDE MONEY FOR POSTAGE

with your orders as we must
pay postage on parcel post
packages before we can send
your merchandise. Don't worry
about sending more than the
correct amount—if you send us
too much, every cent extra will
be promptly returned to you.
You pay only the exact postage
needed for your order.

NOTE—To provide additional
savings and faster service in
filling your order, insurance
fees on Parcel Post shipments
have been discontinued. In
event you have a damage claim,
write directly to the HEATH CO.
and not to the post office.

FOLD 4

FOLD 1

FOLD 3

FOLD 2

Heath's Easy Time Payment Plan

Time Payment Plan available only on orders having cash price of \$90.00 or more.
Available in the Continental United States and the Hawaiian Islands only.

In order to assure prompt shipment of your new Heathkit under the Time Payment Plan, please observe the following instructions.

- 1 First fill out section "B" of the Order Blank on the reverse side of this sheet, designating the Heathkits you wish to buy. If your order totals \$90.00 or more, you may use the Time Payment Plan.
- 2 Insert the amount of your down payment in the Time Payment Agreement below (at least 10% of your total order). A larger down payment reduces carrying charge and monthly payment.
- 3 Refer to the amounts on the Easy Payment Chart which correspond to the unpaid balance on your order (total price of order less down payment). From this chart enter your monthly payments on the Time Payment Agreement.
- 4 Sign your Time Payment Agreement in ink with your usual signature, and fill in the credit statement completely.
- 5 Send this application and your down payment to Heath Company, Benton Harbor, Michigan.

EASY PAYMENT CHART					
Unpaid Balance	Carrying Charge	Up To 12 Monthly Payments*	Unpaid Balance	Carrying Charge	Up To 12 Monthly Payments*
less than \$50	\$ 5	\$ 5	\$170.01-180	\$18	\$17
\$ 50.01-60	6	6	180.01-190	19	18
60.01-70	7	7	190.01-200	20	19
70.01-80	8	8	200.01-210	21	20
80.01-90	9	9	210.01-220	22	21
90.01-100	10	10	220.01-230	23	22
100.01-110	11	11	230.01-240	24	22
110.01-120	12	11	240.01-250	25	23
120.01-130	13	12	250.01-260	26	24
130.01-140	14	13	260.01-270	27	25
140.01-150	15	14	270.01-280	28	26
150.01-160	16	15	280.01-290	29	27
160.01-170	17	16	290.01-300	30	28

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

WRITE FOR FURTHER INFORMATION IF YOU WISH TO ADD ON TO YOUR PRESENT ACCOUNT

TIME PAYMENT AGREEMENT

Please answer all questions fully to help establish your credit promptly. Write your order on the reverse side.

NOTE: Time payment agreement cannot be accepted from persons under 21 years of age. If you are under 21, have this form filled out by a person of legal age, regularly employed or engaged in business. He can make the purchase for you, and will be responsible for payment.

TO: HEATH COMPANY BENTON HARBOR, MICHIGAN

Enclosed is a deposit of \$ _____ on the Easy Payment cost of the equipment on the reverse side. I will pay \$ _____ each month to you at the above address starting 30 days after shipment, until the total time payment price is paid.

Title to and right of possession of said equipment shall remain with you until all payments have been made. Upon default on any payment due on this contract, the full amount unpaid hereon, at your option, shall become immediately due and payable and you may either hold me liable for said amount or repossess the equipment. If you shall repossess, all payments made may be retained as rent for the use and depreciation of said equipment. The loss, injury or destruction of the equipment after I have received it shall not operate as payment or in any manner release me from any obligation hereunder.

If this order is not accepted, you shall refund the down payment with notice of non-acceptance. Acceptance shall be effected when the equipment designated on the reverse side hereof is shipped to me. I certify that all statements in the Credit Statement set forth below are true and complete and are made for the purpose of obtaining credit. This contract is to be governed by the laws of the State of Michigan.

Enter Date _____ Sign Here _____

CREDIT STATEMENT

(IMPORTANT: Please fill in completely. Omissions and errors cause delays.)

FULL NAME _____ (Print) Age _____ Military Serial No. _____ (if serviceman)

WIFE'S NAME _____ (Print) No. of Children and names _____

Residence _____ City _____ State _____ How Long _____

Own or Buying Rent Live with Parents No. of Rooms _____ Paid Monthly \$ _____ Phone No. _____

Landlord's Name (If Owned and Address (Mtg. Held By) _____

Previous Address _____ How Long _____ Previous Address _____ How Long _____ (If less than 3 years at present address)

Previous Landlord _____ Address _____

Employed by _____ Address _____ Business Phone No. _____

Position _____ How Long _____ Dept or Badge No. _____ Salary \$ _____

Previous Employer _____ Address _____ How Long _____ (If less than 3 years at present employment)

Wife's Employer _____ Address _____ Phone _____

Position _____ How Long _____ Dept. or Badge No. _____ Salary \$ _____

Other Income— Give Details _____ Total Family Income \$ _____

CREDIT REFERENCE (Give Your Bank and 2 Merchants, Firms or Finance Companies with whom you do or have done business.)

Your Bank _____ Address _____ Type of Account _____

First Credit Reference _____ Address _____ Present Balance \$ _____ Monthly Payment \$ _____

Second Credit Reference _____ Address _____ Present Balance \$ _____ Monthly Payment \$ _____

Nearest Relative _____ Address _____ Relationship _____ (Do not list those with whom you are living)



By Daystrom

TV ALIGNMENT

Generator KIT

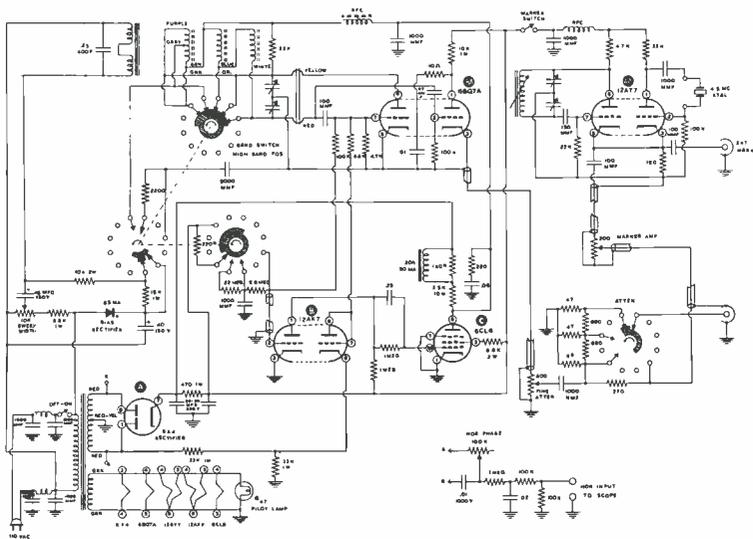
FEATURES

- Oscillator covers 3.6 mc to 220 mc entirely on fundamentals—complete FM and TV coverage.
- Center-sweep circuit swings up to 20 mc each side of center depending on frequency.
- Maximum RF output well over .1 volt.
- All-electronic sweep—no moving parts or mechanical vibration.
- Built-in crystal marker oscillator and variable marker oscillator. Crvstal supplied with kit.



MODEL
TS-4A

\$49⁵⁰



SPECIFICATIONS

Band	Frequency (MC)	Output V (RMS)	Flat Within
"A"	3.6 to 10	0.23	± 1/2 db
"B"	10 to 25	0.22	± 1/4 db
"C"	30 to 80	0.11	± 1/2 db
"D"	80 to 220	0.08	± 1/2 db

(Measured with H-P 410B High Frequency VTVM without compensation for pulse nature of output, and for worst db deviation on each band at a fixed center frequency).

Output Impedance.....50 ohms, terminated at both ends of cable.

Sweep Deviation.....Continuously variable from 0-4 mc lowest max. deviation 0-42 mc highest max. deviation (depending on base frequency).

Markers:

Crystal.....4.5 mc and multiples thereof (included in kit).

Variable.....19 mc to 60 mc fundamentals, 57 mc to 180 mc on harmonics.

External.....Panel terminals provided for external marker.

Attenuators.....Step-switch controls sweep oscillator and marker oscillator together, plus separate variable controls provided for each output.

Blanking.....Effective two-way blanking eliminates return trace. Phasing control also available.

Tube Complement.....6B07A Sweep osc. and buffer, 12AX7 variable and crystal marker osc., 12AX7 blanking and AGC amplifier, 6CL6 shunt regulator, 6X4 rectifier.

Cables.....3 supplied: output, scope horizontal and scope vertical.

Power Requirements.....110V AC, 50-60 cycles. 50 watts.

Dimensions.....13" wide x 8 1/2" high x 7" deep.

Shipping Weight.....16 pounds.

Many special design features have been combined in the TS-4A Sweep Generator to make this instrument easy to operate and as reliable as possible. An entirely new type of sweep system is used, which provides electronically controlled center sweep on fundamentals throughout the entire range of the instrument. Fundamental output is used in the range of 3.6 mc, to 220 mc, and there is plenty of output to align any type of circuit that may be encountered, hot or cold. The marker and sweep oscillators are well shielded and isolated from each other to prevent internal interference. A new type of regulated power supply is used, providing much improved output amplitude regulation. Marker accuracy is assured, since it is calibrated against a 4.5 mc crystal, furnished with the kit. This crystal also provides an accurate marker or signal for alignment of sound IF strips in intercarrier type sets, as well as 4.5 mc spaced markers for bandwidth identification.

The electronic sweep circuit has nothing to wear out or cause trouble since no moving parts or vacuum tubes are used. The heart of the system is a controllable inductor, which varies frequency by magnetic means. Not only is this device trouble-free and consistent in performance, it also requires very little power to provide wide range sweeps with excellent linearity. No "hot" controls or tubes to worry about.

The oscillator circuit provides frequency coverage from 3.6 mc to 220 mc in four ranges, including the FM spectrum. Sweep deviation is smoothly controllable from 0 up to as high as 42 mc, depending on frequency. Fundamentals are used throughout the entire range, eliminating spurious beats and parasitics that are so often troublesome in beat frequency type sweep generators. The use of funda-

mentals also gives much more output at all frequencies, up to .23 volts RMS on the lower band, and .08 volts RMS at 220 mc. Alignment of tuners, IF strips, boosters, etc. is made easy due to this high output. Cold alignment of tuned circuits, filters and traps is also made possible by the TS-4A, used with a demodulator probe. Fundamental operation allows smooth control of signal output so that high gain stages can be aligned without danger of overloading. Blanking is used to eliminate the return trace and provide a base reference.

The time tested and proven Heathkit step-by-step instruction procedure is employed in the construction manual, along with sections pertaining to circuit description, theory of operation and applications. Detailed information regarding various procedures used in actual alignment work is also supplied. Alignment problems are shown and carried through using the sweep generator and an oscilloscope, and further mention is made of further equipment such as RF signal generators, grid dippers, etc. The construction manual fulfills two requirements, a complete construction assembly and service manual, as well as an alignment procedure and service technique reference. Many operational features make the new TS-4A sweep generator unique in the service field. The built-in crystal and variable markers afford a degree of flexibility rarely obtainable in any instrument designed specifically for servicemen. Ease of operation is enhanced by the new type of center sweep system, for it is only necessary to set the dial to the appropriate frequency and turn up the sweep dial to obtain a trace. A truly outstanding number of features at a tremendous price saving! Shpg. Wt. 16 lbs.



\$59⁹⁵ MODEL
CD-1



COLOR BAR AND DOT

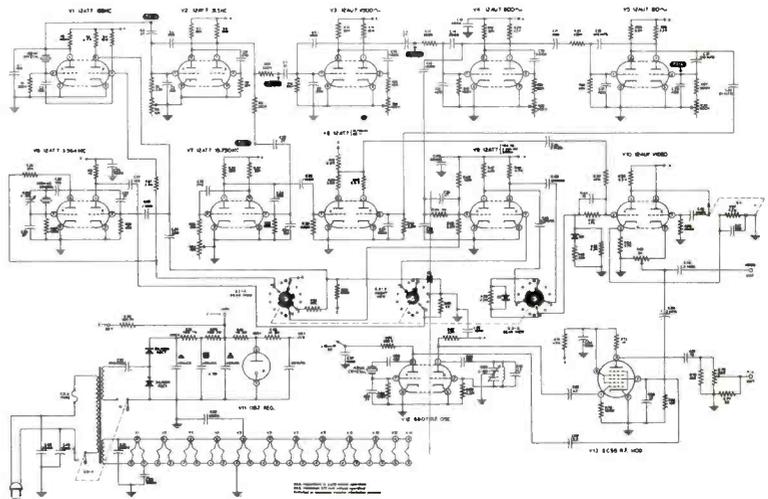
Generator KIT

FEATURES

- All frequencies crystal controlled for steady locked-in patterns. (No external sync lead required.)
- New shading bar pattern for screen and background adjustment.
- 10—vertical color bars.
- Choice of six different patterns.
- RF and video output with separate level controls.
- Crystal controlled sound carrier with off-on switch.

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. Source impedance approx. 1,000 ohms.
Modulation	White dot pattern, crosshatch 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 volts AC, 50-60 cycles, 70 watts.
Dimensions	13" W. x 8½" H. x 7" D.
Shipping Weight	12 lbs.



Technicians by constructing the CD-1 will not only own a time and labor saving instrument, but will also gain added knowledge of a new and profitable field.

The CD-1 combines two basic units, the color bar generator and white dot generator in one versatile portable instrument, which has crystal controlled accuracy and stability, and yet the cost is within most technicians budget. Produces white dot pattern, crosshatch, horizontal or vertical bar patterns, 10 color bars and a new shading bar pattern.

Ten vertical color bars are produced using the crystal controlled, off-set carrier method, giving the following colors from left to right when the hue control of the color set is in the center of its range. 1. yellow-orange, 2. orange, 3. red, 4. magenta, 5. reddish-blue, 6. blue, 7. greenish-blue, 8. cyan, 9. bluish-green, 10, green. Using these bars, A.F.C., phase and matrix alignment may be performed. A white leading edge and black trailing edge are provided on the color bars to check color fit. A new type of pattern, called shading bars, is provided for the adjustment of screen and background controls to achieve correct gray-scale tracking. The CD-1 has RF output on any channel from 2 to 6, with an RF level control to check sensitivity and prevent overloading of the automatic gain control. A crystal controlled sound-carrier with off-on switch is provided for adjusting the fine tuning control. Either positive or negative video output is available for trouble-shooting video circuits, and may be adjusted with the video level control. This control also varies the R.F. modulation which provides a check of color hue and sync with different signal levels.

Horizontal and vertical sync pulses are crystal controlled to the

same "frame" rate as a TV station. These pulses provide the necessary blanking and lock the various patterns firmly on the screen, without jitter or crawl. The user, therefore, may be assured that color receivers converged with the CD-1 will still be converged properly on a television program from a station. Self-contained sync pulses also eliminate the need for any bothersome external sync leads, and any one of the six available patterns may be selected with one switch, without any further adjustment to the generator or receiver.

Dots are small sized and sharply defined, and are fixed as to size and number. The cross-hatch pattern may be used for linearity checks on either color or black-and-white receivers. The height and width of the raster may be determined by counting the fixed number of bars. Horizontal and vertical bar patterns are also available for convergence adjustments.

The CD-1 is compact, light in weight, and has smooth control action. The 13 tube circuit has been carefully laid out to allow ease of assembly. The construction manual contains complete step-by-step instructions and pictorial diagrams in addition to a detailed circuit description, which will be helpful in understanding basic color circuit principles. Easy to follow calibration instructions are furnished with actual oscilloscope patterns to aid in alignment. Convergence, screen and background adjustments of a color set are also thoroughly covered in the manual. This kit is complete in every respect including 3 crystals and test lead. The power supply features voltage regulation and uses long life silicon diode rectifiers. Compare with other generators on the market and you'll realize what a tremendous dollar value it represents. Shpg. Wt. 12 lbs.



By Daystrom

CATHODE RAY

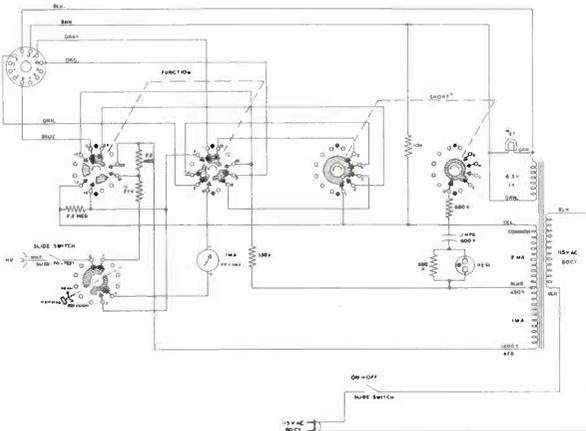
Tube Checker KIT

FEATURES

- Self-Contained power supply, transformer operated to furnish normal test voltages for CRT.
- Large 4½" 3 color meter scale for quality readings, plus a neon leakage indicator.
- Luggage-type portable cabinet with plastic handle and removable cover.
- Permanent test cable with CRT socket and anode connector.
- Special spring-loaded switches for complete safety in operation.



MODEL CC-1 **\$2250**



Here is the ideal tool for checking TV picture tubes. It eliminates all doubt for the TV service man and, even more important, for the customer. Carry it on service calls and clearly demonstrate the quality of a customer's picture tube in his own home. This fine unit will check all electromagnetic deflection-type tubes using the duo-decal (12-pin) base. You no longer have to worry about the type of focusing, electron gun or screen. Provision is made for testing for shorts, leakage, and emission capabilities, with a separate test for beam current. You can test tubes without removing them from the receiver or carton. Ion traps are not required for any test.

Special provision is made in the model CC-1 for the actual observation of the gun aperture on the face of the CRT. Irregularities such as rough or burned edges show up clearly through the use of

SPECIFICATIONS

Checks	Cathode emission, beam current, shorted elements, leakage between elements.
Provides	Magnified visual inspection of gun aperture. Indication of quality of fluorescent coating.
Tests	Electromagnetic deflection types with duo-decal base, straight or bent guns, electrostatic or electromagnetic focus, clear or filterglass faceplates, plain or aluminized screens.
Power	105-125 volts AC, 50-60 cycles, 15 watts.
Dimensions	7½" high, 6¾" deep, 12½" wide.

a unique "shadow-graph" method of projection. No special equipment is required; it's all contained in the CC-1. The projected spot of light will show the customer the relative quality of the tube's fluorescent coating and light-giving quality of screen phosphor. The CC-1 is AC power transformer operated and supplies all operating voltages to the cathode ray tube. It is designed to last a lifetime; no tubes to burn out or replace. A permanent test cable with CRT socket and anode connector is included. Quality indications are read on a large 4½" three color meter scale; shorts on a neon leakage indicator. You can be sure of its accuracy because the checker sets up all proper test conditions for each tube element. It is housed in an attractive luggage-type portable cabinet with removable cover. Simple operating chart provided. Operates in any position. Shpg. Wt. 10 lbs.



SAFE ARRIVAL ASSURED THROUGH PROPER KIT PACKAGING!

The photograph on the left shows one of our kit packaging lines in operation. Experience gained in packing thousands of Heathkits assures you of receiving your kit in top-notch condition. Carton size is determined by chassis or cabinet dimensions, and these items are placed in a strong corrugated carton and used as a liner for additional strength. All other kit material is then packed inside the cabinet or chassis for added protection. Delicate items are packed separately to forestall possible damage. Before final sealing of the kit carton, all unused space is firmly packed with packing material to prevent shifting of contents during transportation.



\$24.50 MODEL V-7A



By Daystrom

ETCHED-CIRCUIT

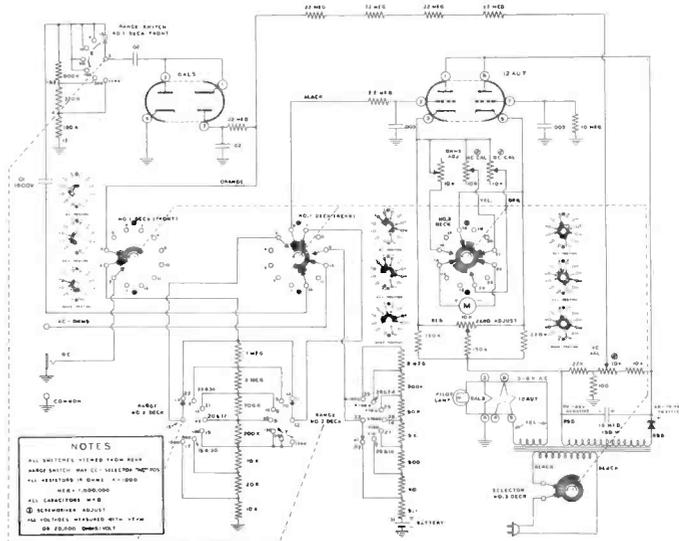
VTVM KIT

FEATURES

- Modern printed circuit design for faster, easier construction and stable performance.
- Logical and functional placement of controls for smooth, rapid operation. 1% precision resistors used for high accuracy.
- Measures ACV (Peak-to-Peak)—ACV (RMS)—DCV—resistance. High impedance 11 megohm input.
- Comprehensive construction manual for simplified assembly.

SPECIFICATIONS

Electronic D.C. Voltmeter:	
7 Ranges	0-1.5, 5, 15, 50, 150, 500 and 1500 volts full scale, with accessory probe to 30,000 volts.
Input Resistance	11 megohms (1 megohm in probe). On all ranges, 1,100 megohms with accessory probe.
Sensitivity	7,333,333 ohms per volt on 1.5 volt range.
Circuit	Balanced bridge (push-pull) using twin triode.
Accuracy	± 3% full scale.
Electronic A.C. Voltmeter:	
7 RMS Ranges	0-1.5, 5, 15, 50, 150, 500, 1500 scales reading RMS (.707 of positive peak).
Accuracy	± 5% full scale.
7 Peak-to-Peak Ranges	0-4, 14, 40, 140, 400, 1400, 4000.
Electronic Ohmmeter:	
7 Ranges	Scale with 10 ohms center X1, X10, X100, X1000, X10K, X100K, X1 meg. Measures .1 ohm to 1000 megohms with internal battery.
Meter	4½" 200ua movement, Polystyrene case.
Multipliers	1% precision type.
Circuit Board	Printed circuit, etched metal process ½" XXXP laminated phenolic .00135 copper foil.
Tubes	1—12AU7, twin triode meter bridge. 1—6AL5, twin diode full wave AC rectifier.
Battery	1½ volt flashlight cell.
Cabinet Size	7¾" high x 4¾" wide x 4¼" deep. Charcoal gray panel, feather gray cabinet.
Power Requirements	105-125 volt, 50-60 cycle AC, 10 watts.
Kit Shipping Weight	7 lbs.



This exceptionally fine vacuum tube voltmeter will rapidly and conveniently measure AC volts (RMS), AC volts (peak-to-peak), DC volts, resistance, and db. One switch controls the function selection, while the other determines the range to be used. Convenient front panel zero adjust and ohms adjust controls. Zero center operation within the range of front panel controls. A low voltage scale on the V-7A provides well over 2¼" of scale length per volt measured!

High input impedance in a vacuum tube voltmeter is valuable in that the loading effect of the instrument is negligible, and the circuit under test is not disturbed nor "loaded" by the test instrument. This, along with the other advantages of a vacuum tube voltmeter, and especially of the Heathkit V-7A, were formerly reserved for laboratories because of price. Since the introduction of the brilliant Heathkit VTVM, however, these advantages have been made available to all. It is especially valuable in all electronic applications. Use it to measure all operating voltages and potentials such as B+ voltage in AC-DC, or straight AC power supplies—filament voltage—bias voltage—AVC voltage—line voltage, etc. Ideal for measurements in all types of AM, FM and TV circuits. To check discriminator or detector operation—AVC or AGC performance—use the ohmmeter to measure circuit continuity, circuit resistances, to test out individual components with resistance measurements, or to trace out circuit wiring through cables or chassis openings. The perfect all-around instrument for either laboratory or service shop activities.

Functional in design and convenient to use, the time-proven Heathkit vacuum tube voltmeter is the world's largest selling instrument of its type and has rapidly become the accepted standard in the industry. You can enjoy the outstanding performance of a Heathkit VTVM as thousands of others have done!

Adapted for printed circuit board operation, the model V-7A is now better than ever. Gradual modification of our time-proven VTVM circuit over the years has resulted in a trouble-free "polished" circuit which can be depended upon for maximum accuracy and stability. A 6AL5 tube operated as a full wave AC input rectifier permits 7 peak-to-peak voltage ranges with upper limits to 4,000 volts. Just the ticket for you TV servicemen. A voltage divider in the 6AL5 input circuit limits applied AC input to a safe level. This circuitry, and isolation of the meter in the cathode of the 12AU7 bridge circuit, affords a high degree of protection for the sensitive 200 micro-ampere meter.

Extensive operational coverage is afforded by 7 AC (RMS) and DC voltage ranges of 1.5, 5, 15, 50, 150, 500, 1500, 7 peak-to-peak AC voltage ranges of 4, 14, 40, 140, 400, 1400, 4000, 7 ohmmeter ranges of x 1, x 10, x 100, x 1000, x 10 k, x 100 k, x 1 megohm, and a zero-center db scale. Separate AC and DC test leads and probes are provided for circuit efficiency, and polarity reversing switch is employed for DC operation.

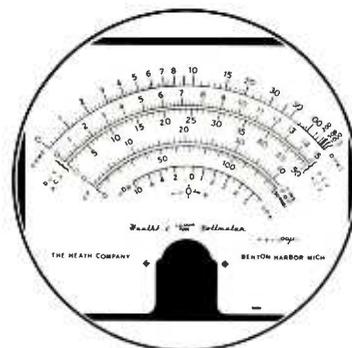
Most of the V-7A circuit is etched in copper foil and bonded to

The range switch of this instrument is especially designed for this specific application. Resistors fit conveniently between decks, and no unused or blank terminals exist to confuse the kit builder. Note that precision resistors are used in multiplier circuits.



Time-proven etched metal circuit boards are employed in the V-7A. These not only simplify assembly and cut construction time in half, but they permit levels of circuit stability not possible with ordinary conventional wiring methods.

A high quality precision meter is employed in the VTVM. It is imprinted with two-color black and red calibrations on a white background. This makes for quick identification of ranges and maximum legibility.



high-grade rigid 3/32" XXXP phenolic sheet. This board provides the circuit, and the components are mounted and soldered to it.

Assembly time is virtually cut in half while assurance is provided that the V-7A you build will be an exact replica of our laboratory model. Simplified assembly and constant circuit performance are important features for your consideration.

In addition, this rugged unit provides firm mounting of components, good, low-resistance conductor paths, and allows individual standard components to be removed and replaced with new ones should this become necessary.

A transformer-type power supply is used for the line-operated model V-7A, with good filtering for improved circuit performance. The meter is sealed against dust, and is a 4 1/2", highly readable, 200 microampere unit. Bracket construction behind the panel protects the circuit parts and allows the VTVM to be placed in any position without parts damage while construction is in progress. A self enclosed battery for the ohmmeter portion of the circuit fits neatly into the space behind the panel.

Featuring high, 11 megohm input impedance, the model V-7A is attractive in appearance also, with the charcoal gray, drawn aluminum panel and high definition white lettering for good readability. The pilot lamp is recessed behind the panel and shines through the edge of the plastic meter case for a very smart appearance.

All components used in the V-7A VTVM are of standard, first-line

quality. The multiplier circuits use deposited-carbon type 1% precision resistors instead of following the usual practice of supplying matched pairs of ordinary carbon resistors. Switches have been especially designed for this particular instrument, and represent every possible consideration from the standpoint of simplified wiring and ease of assembly. Standard brand, commercially available tubes, tube sockets, condensers, controls, etc., are employed to minimize service problems in the event component replacements be required.

The construction manual supplied with the model V-7A VTVM sets a new standard in instruction material. In this manual we provide detailed step-by-step checkoff assembly procedure for the complete operation of constructing the VTVM. In addition, numerous schematics, pictorial diagrams and illustrations are used to insure trouble-free construction. Besides outlining instrument assembly, the manual describes the theory of instrument operation and actual application in measurement work. For further convenience, large-scale pictorials are provided which can be fastened to the area above your work bench for quick reference.

The Heath Company is justifiably proud of the fact that the VTVM manual is in demand for instruction work in various educational programs and has set a new pattern level for the entire kit industry. This kit is complete in every respect—even to the inclusion of test leads and battery. Shpg. Wt. 7 lbs.

**HEATHKIT 30,000 VOLT
D. C. HIGH VOLTAGE
Probe KIT**



NO. 336
\$450

For TV service work or any similar application where measurement of high DC voltage is required, the Heathkit high voltage probe will prove invaluable. A precision multiplier resistor mounted inside the two-color sleek plastic probe body provides a multiplication factor of 100 on the DC ranges of the Heathkit 11 megohm VTVM. Plenty of insulation for safety of operation, even at highest TV potentials. Shpg. Wt. 2 lbs.

**HEATHKIT ETCHED
CIRCUIT PEAK-TO-PEAK
Probe KIT**



No. 338-C
\$550

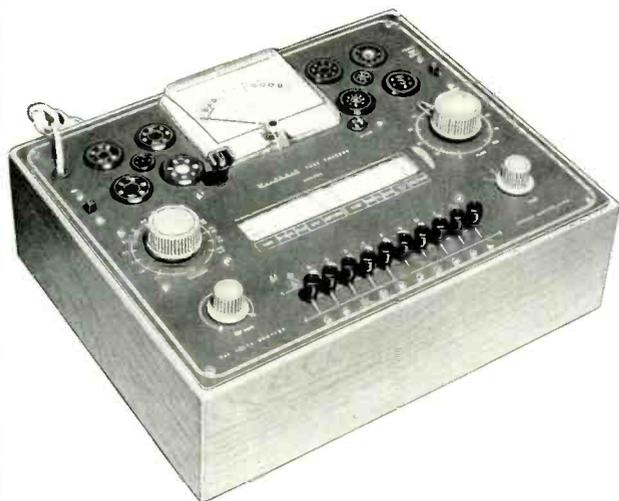
Now read peak-to-peak voltages on the DC scale of any 11 megohm VTVM with this new probe employing printed circuits for circuit stability and low loss. Readings can be made directly from the VTVM scales without involved calculations. Measurements over the frequency range of 5 kc to 5 megacycles. Use this probe to extend the usefulness of your VTVM in radio and TV service work. Note: Not required for the new Heathkit V-7A VTVM. Shpg. Wt. 2 lbs.

**HEATHKIT ETCHED
CIRCUIT RF
Probe KIT**



No. 309-C
\$350

The Heathkit RF Probe used in conjunction with any 11 megohm VTVM will permit RF measurements up to 250 megacycles ± 10%. A useful, convenient accessory for those occasions when RF measurements are desired. Uses printed circuits for increased stability and ease of assembly. Ideal for further extending service applications of your Heathkit VTVM. Shpg. Wt. 1 lb.



By Daystrom

Tube Checker KIT

\$29⁵⁰ MODEL TC-2

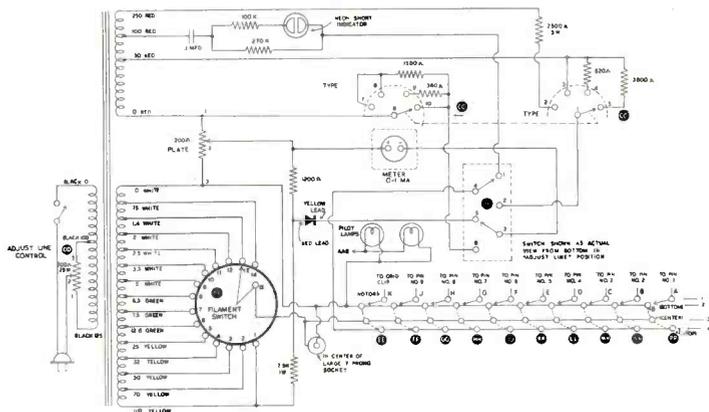
FEATURES

- Simplified harness wiring.
- Adequate roll chart illumination—easy-to-read panel lettering.
- Individual tube element switches.
- Attractive counter-style cabinet.
- Large 4½" meter with 3 color "Good-Bad" scale.

SPECIFICATIONS

Test	Checks for quality, emission, shorted elements, open elements, filament continuity.
Tube Types	4, 5, 6, and 7 pin large, regular and miniature, octal, loctal, Hytron, 9-pin miniature and pilot lamps.
Meter	Large 4½" meter with "GOOD-BAD" scale.
Roll Chart	Built in, illuminated, smooth action.
Filament Voltage	Switch selected, 14 different voltages from 0.75 to 117 volts.
Element Test Voltages	0-250 volts.
Dimensions	14" wide x 11" deep x 4¼" high.
Power Requirements	105-125 volts, 50-60 cycles, line adjust control.

This modern tube checker is a favorite with service technicians all over the country, as well as with the beginning novice. Outstanding in both quality and performance the TC-2 will check all tube types commonly encountered in radio and TV service work. Tubes can be tested for open, short, leakage, heater continuity and quality. Tube condition is indicated on the large 4½" meter with multi-color "good-bad" scale. A neon bulb indicator shows filament circuit continuity, and leakage or shorts between elements. 10 three-position lever switches check each tube element for open or short individually. The lever switch arrangement for each tube element is not only rapid and flexible, but also insures the instrument against obsolescence. A blank socket is provided for future tube types. The



TC-2 will check 4, 5, 6 and 7-pin octal and loctal tubes, 7 and 9-pin miniature tubes, and the 5-pin hytron tubes. Provision is made for checking pilot lamps with a contact-type socket. Fourteen different filament voltages are available from .75 to 117 volts. The line adjustment control incorporated offsets any variation in the line voltage. An illuminated roll chart contains all necessary tube test data. A top cap clip lead is provided for testing vacuum tubes with grid or plate caps. Neat professional wiring and simplified construction is assured through a color-coded cable harness and easy-to-follow instructions. All parts supplied are of the highest quality for years of dependable service. Eliminate guesswork, and save time by having your own tube checker. Shpg. Wt. 12 lbs.

HEATHKIT PORTABLE

Tube Checker KIT

The TC-2P is identical to the TC-2 except that it is housed in a rugged carrying case. This is a strikingly attractive and practical two-tone case finished in proxylin impregnated material. The cover is detachable and the hardware is brass plated. Topped off with a sturdy plastic handle, this case imparts a professional appearance to the instrument. Ideal for home service calls or any portable application.

Carrying case also serves to protect the tube tester when it's not in use. Seals out dust, and protects the meter and switches from injury. Only \$34.50 complete. Shpg. Wt. 15 lbs.



MODEL TC-2P
\$34⁵⁰

HEATHKIT PORTABLE

Tube Checker CABINET

Portable tube checker case may be purchased separately for the TC-2, and will also fit the earlier Model TC-1 Tube Checkers. See description in portable tube checker advertisement on this page. Shipping weight 7 lbs. Cabinet No. 91-8. Worth every penny of the price.

NO. 91-8
\$750

HEATHKIT TV PICTURE TUBE

Test Adapter...

The Heathkit TV Picture Tube Test Adapter is designed to be used with the Model TC-2 Tube Checker. Check for emission, shorts, etc. in TV picture tubes and thereby determine tube quality. Consists of 12-pin TV tube socket, 4 ft. cable, octal connector, and necessary technical data. Not a kit, but a ready-assembled device. Shpg. Wt. 1 lb.



MODEL 355
\$450



By Daystrom

VISUAL-AURAL

Signal Tracer KIT

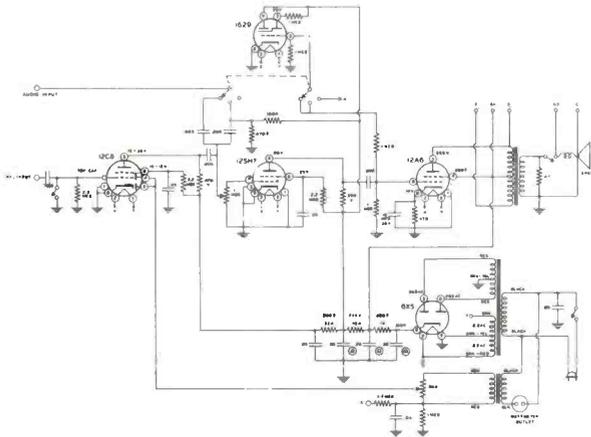
FEATURES

- 2 channel input for visual and aural signal tracing.
- Built-in wattmeter, 30-500 watts calibrated—unique noise locator circuit.
- High RF sensitivity—permits signal tracing in all parts of radio receiver.
- Useful in AM, FM and TV sets—RF and audio probes furnished.
- Substitution test speaker and output transformer.



MODEL
T-3

\$2350

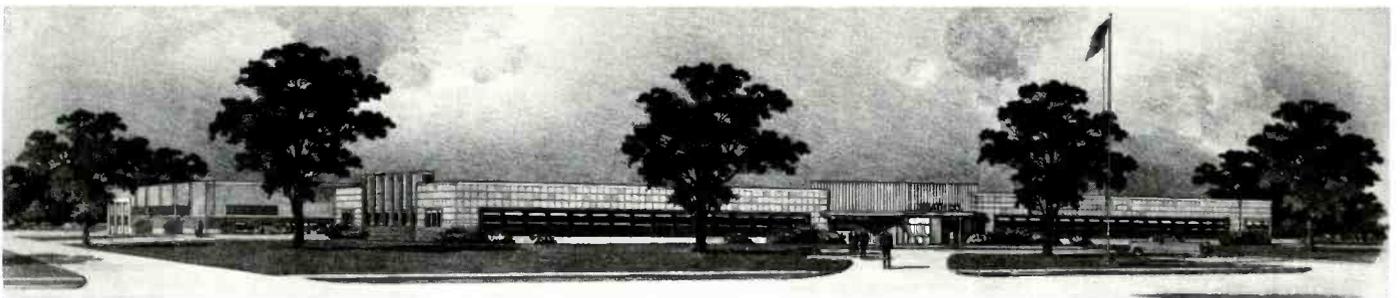


SPECIFICATIONS

Channels	1 hi-gain with demodulator type probe; 1 lo-gain with audio probe.
Indications	Built-in speaker-electron beam "eye" tube.
Tubes	12C8 amplifier, wattmeter rectifier; 12SH7 high gain pentode amplifier; 12A6 beam power output; 1629 electron beam visual indicator; 6X5 full wave rectifier.
Power	105-125 volts AC, 50-60 cps. cycles.
Dimensions	9½" wide, 6½" high, 5" deep.

Here is an instrument loaded with extras to make your work easier. The model T-3 Signal Tracer permits visual and aural signal tracing of RF, IF, and audio circuits in AM, FM and TV receivers. Also included is a built-in wattmeter (approximately 30 to 500 watts) which provides a means of quickly checking a suspected circuit for unusual wattage consumption. A "noise locator" circuit permits you to easily pick out resistors, condensers, controls, etc. that may be causing noisy reception. The kit includes both audio and RF probes so that you can trace a signal through a complete radio receiver from antenna to speaker locating a defective stage immediately. Signal strength is indicated by a built-in 4" PM speaker as well as

an electron beam "eye" tube. Two input channels are provided (audio-RF) to take care of all sections of a receiver under test. The speaker and output transformer can be used separately for test purposes when either or both of these items are missing from a receiver being serviced. Panel binding posts are provided along with a speaker switch so that external connections can be made quickly to the speaker voice coil or the output transformer primary or both. Detailed instructions are provided for assembly as well as information on its use in various applications. The T-3 is a real work horse, you can use it for years and still discover new applications from time to time. Shpg. Wt. 9 lbs.



MODERN FACILITIES TO SERVE YOU EVEN BETTER!

Soon after you receive this catalog the Heath Company will be moving into its new plant now nearing completion. The modern factory and office will contain 140,000 square feet of floor area, which will enable us to do an even better job of serving you in the future. New Office equipment and methods of order handling as well as a smooth flow of materials from the receiving platform

through the production lines and to the shipping platform, will help us to expedite your orders. New engineering facilities will alleviate overcrowded conditions allowing us to more rapidly expand and improve our present line of kits to continue giving you the most for every dollar you spend. Please stop by and see us when you are in this area.



\$19⁵⁰ MODEL
SG-8



By Daystrom

RF SIGNAL

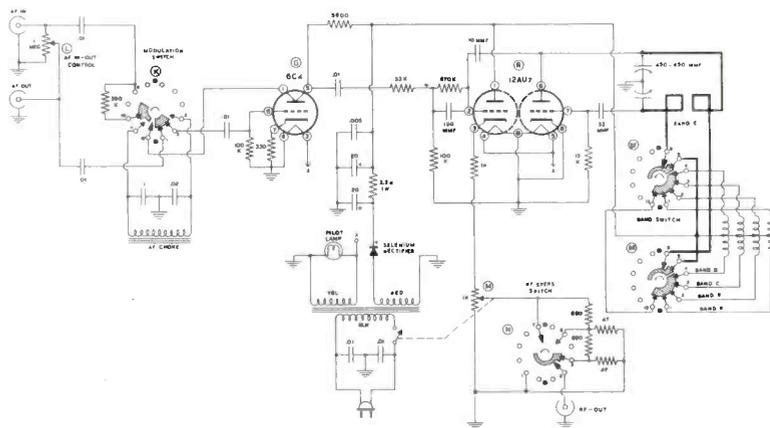
Generator KIT

FEATURES

- Separate oscillator sub-chassis for uniform circuit characteristics.
- 160 kc to 110 mc on fundamentals; 110 mc to 220 mc on calibrated harmonics.
- Prewound and precalibrated coils.
- 6 to 1 vernier dial ratio.
- 3 outputs available: unmodulated RF—modulated RF—audio at 400 cps.

SPECIFICATIONS

Frequency	160 kc to 110 mc fundamental on 5 bands, 110 mc to 220 mc on calibrated harmonics.
RF output	In excess of 100,000 microvolts at low impedance.
Modulation	400 cps internal; provisions for external modulation.
Attenuation	Step and fine types.
AF output	2 to 3 volts at approx. 400 cps.
Tubes	1—12AU7, 1—6C4.
Power	105-125 volts AC, 50/60 cycles.
Dimensions	9½" wide, 6½" high, 5" deep.

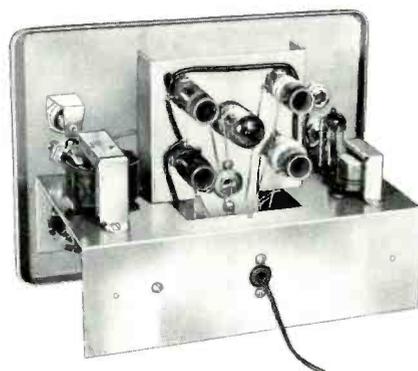


This instrument is "service man engineered" to fill the requirements for a reliable service instrument at moderate cost. Frequency coverage extends in five bands from 160 kc to 110 mc on fundamentals, and the dial is calibrated to 220 mc for usable harmonics of the fundamental frequencies. Prewound and precalibrated coils make calibration unnecessary for service applications. Construction is simple and straight-forward, and the comprehensive construction book with step-by-step assembly procedure assures success. All parts are included in the kit, ready for assembly. Build your own generator and save! A reliable signal generator should be among the first test instruments purchased by the part-time serviceman or beginning service shop operator. Any radio and TV service shop without a good reliable signal generator is seriously handicapped. Wasted time means less profit. The SG-8 provides a quick means of alignment in RF, IF and tuned circuits of all kinds. Use it as a signal source for signal tracing in a faulty RF, IF or audio circuit to quickly locate the defective stage in the receiver under test. In a very short time it will pay for itself in time saved.

The Heathkit model SG-8 Signal Generator kit provides a stable, modulated or unmodulated output of at least 100,000 microvolts which can be controlled by both the continuously variable attenuator and a fixed step attenuator. Internal modulation is at a frequency of 400 cycles, or the unit can be externally modulated at other frequencies. The 400 CPS signal can also be used separately for audio tests if desired. AF output of 2-3 volts is available for audio testing. The model SG-8 uses a dual purpose 12AU7 as a colpitts oscillator

and cathode follower for stable, isolated, low impedance output, and a type 6C4 tube for 400 cycle oscillator. The power supply is transformer operated for safety and efficiency. A special sub-chassis is provided for the installation of the entire oscillator circuit, thus keeping control over all variables that would affect frequency.

The SG-8 has excellent stability due to the use of a cathode follower buffer stage between the RF oscillator and the output circuits. Its low impedance is another desirable characteristic. Overall efficiency is assured by the use of top quality components throughout. The kit is complete including output cable, alligator clips, and comprehensive instruction manual. Accuracy of calibration is most important. Operation of the SG-8 is well within the limits normally required for service work. Shpg. Wt. 8 lbs.





HEATHKIT

By Daystrom

LABORATORY RF

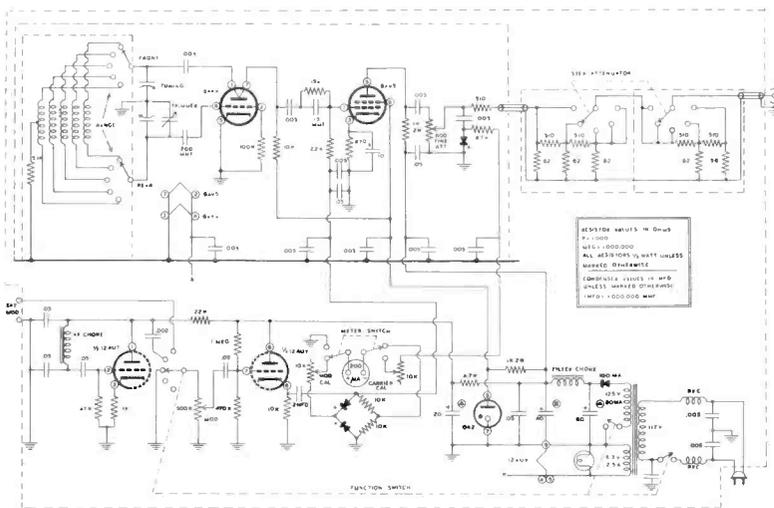
Generator KIT

FEATURES

- Panel meter calibrated in output voltage and percent modulation.
- Double shielding of oscillator circuits.
- Operation on fundamentals from 100 kc to 30 mc in five ranges.
- Output impedance termination 50 ohms.
- Voltage regulated B plus supply—transformer operated.



MODEL **\$48⁹⁵**
LG-1



SPECIFICATIONS

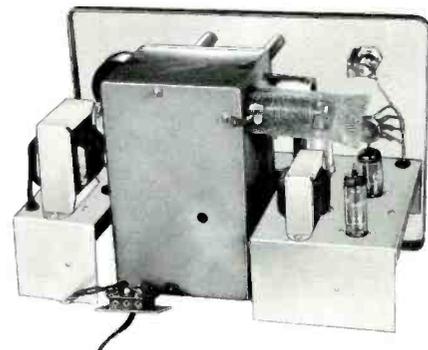
Frequency	100 kc - 30 mc in 5 calibrated bands.
Output	up to 100,000 microvolts.
Attenuation	10:1 ratio in 5 steps. 10:1 ratio continuous metered.
Modulation	0-50% metered, 400 cps internal, or 60-10,000 cps external.
Termination	50 ohms.
Tubes	1—6AF4, 1—6AV5, 1—12AU7, 1—OB2.
Power	105-125 volts AC, 50-60 cycles.
Dimensions	13" wide, 8½" high, 7" deep.

The Heathkit LG-1 Laboratory Generator was designed for the professional service shop or laboratory, and is an instrument suitable for use in design and development work as well as in servicing. It established a new standard of performance for kit instruments. Ideal for checking RF and IF stage gain, overall circuit sensitivity, demodulator performance, or selectivity. Such applications are possible because of the accurately calibrated 200 microampere panel meter which will read the output voltage in microvolts or percent modulation. The choice is provided by a meter switch. A real timesaver for otherwise difficult alignment and adjustment problems.

The frequency range of this fine instrument is from 100 kc to 30 mc—all on fundamentals, and divided into five easy-to-read calibrated bands. The metered output is in excess of 100,000 microvolts, and both fixed step and variable output attenuation are possible. Circuit operation is stabilized by copper-plated double shielding, plus voltage regulation in the power supply. A flexible instrument, the LG-1 has provision for internal modulation or external modulation, and uses a colpitts RF oscillator followed by an amplifier which is grid modulated by the colpitts AF oscillator and cathode follower circuits. DC is fed through the meter switch from the fine attenuator control for RF level and from the AF cathode follower for modulation percentage. The output is obtained at a coaxial cable terminating in a plastic "pod" provided with two binding posts for convenient connection right at the circuit under test. The terminating resistance is enclosed in the pod, and can be changed if desired. Modulation

is variable from 0 to 50%, and is at a frequency of 400 cycles internally, or can be modulated externally at frequencies between 60 CPS and 10,000 CPS. The power supply consists of the power transformer, line filter, selenium rectifier, L-C filter, and an OB2 voltage regulator.

The Heathkit Laboratory Generator is complete with all parts furnished including output cable. The several sheet metal shields and chassis are factory formed and punched for perfect fits. An attractively finished and professional panel makes the LG-1 an instrument that you can be proud to own. Construction and use are simplified by the now famous Heathkit manual of instruction. Invest a little time and money now and be rewarded by many years of dependable service. The model LG-1 is a top-notch instrument all the way through. Shpg. Wt. 16 lbs.





\$29⁵⁰ MODEL
MM-1



By Daystrom

20,000 OHMS/VOLT

VOM KIT

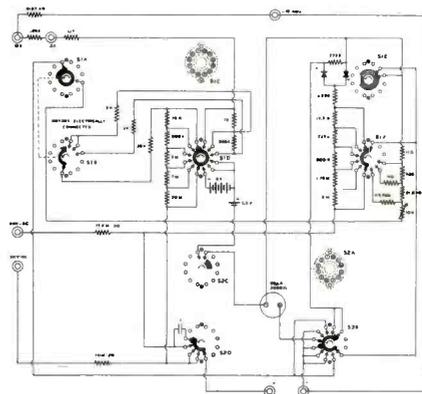
FEATURES

- 20,000 ohms per volt sensitivity DC, 5,000 ohms per volt AC.
- Polarity reversal switch—eliminates transferring test leads.
- All 1% precision multiplier resistors.
- Sensitive 50 microampere 4½" meter.
- Modern cabinet styling—attractive appearance.

SPECIFICATIONS

Sensitivity	20,000 ohm/volt DC, 5000 ohm/volt AC.
Range, DC volts	1.5, 5, 50, 150, 500, 1500, 5000.
Range, AC volts	1.5, 5, 50, 150, 500, 1500, 5000.
Range, Direct Current	150 microamperes, 15—150—500 milliamperes, 15 amperes.
Range, Ohmmeter	0.2 ohms to 20 megohms.
Range, Decibels	—10 to +65 db.
Resistors	1% precision type.
Controls	Range switch, Output-AC-DC-Reverse DC switch, Ohms adjust control.
Batteries	1 type C cell, 4 Penlite cells.
Cabinet	Black Bakelite.
Dimensions	7½" X 5½" X 4".
Net Weight	4 lbs.
Shipping Weight	6 lbs.

The Heathkit VOM provides wide voltage, current, resistance and db ranges to cover hundreds of possible applications. Sensitivity is 20,000 ohms-per-volt DC and 5,000 ohms-per-volt AC. Function and range switches provide full scale settings of 0-1.5, 5, 50, 150, 500, 1500 and 5000 volts for both AC and DC. Current ranges are 0-150 ua, 15 ma, 150 ma, 500 ma and 15 a. Resistance ranges are R x 1 (15 ohm center scale), R x 100 (1500 ohm center scale), and R x 10 K (150,000 ohm center scale). Measures resistance from as low as .2 ohms to as high as 20 megohms. Db coverage is —10 db to +65 db. Maximum accuracy is assured on all ranges by the use of 1% voltage divider resistors. The model MM-1 is insensitive to RF fields and may be used in transmitter work as well as all other types of electronic



service, both at home and in the field. Each part used in the Heathkit VOM was chosen for both quality and ease of construction. The large 4½" 50 microampere meter has more than enough sensitivity for even the lowest voltages on the 1.5 volt scale. Actually a single volt on the lowest range will cause a deflection of 2¼" for accurate low-level indications. A polarity reversing switch is provided right on the front of the instrument eliminating transferring of test leads when alternately measuring + and — voltages. The sleek black bakelite case not only keeps out dust and protects internal components but makes the instrument most attractive. Requiring no external source of power, the MM-1 uses standard commercial batteries that are easily replaced when necessary. Shpg. Wt. 6 lbs.

HEATHKIT

Handitester KIT

The Heathkit Handitester is an ideal first instrument for the hobbyist, home experimenter, or home handyman. Just the ticket for measuring line voltage, checking batteries, testing continuity of circuits, doing automotive electric repairs, or repairing home appliances, servicing high fidelity systems, or servicing radio or TV sets at home. The instrument is completely portable in that it requires no external source of power. Measures AC and DC voltages, direct current, and resistance. AC and DC voltmeter ranges are 0-10, 30, 300, 1000 and 5000 volts. Measures resistance from 0 to 300 ohms (30 ohm center scale), and from 0 to 300,000 ohms (3,000 ohm center scale). Also measures direct current from 0 to 10 ma, and 0 to 100 ma. Sensitivity is 1,000 ohms-

per-volt, 1% precision resistors employed. No calibration required. The physical dimensions of the M-1 are such that it can be kept in your automobile glove compartment, desk drawer, tool box, or on the work bench. Very handy for use in radio and TV service shops when the main test instruments are occupied, and perfect for quick checking on home service calls. The 3" meter scale is easy to read and the combination function-range switch simplifies operation. Equally valuable for the beginner or the experienced service man or engineer. Easy to build from complete instructions supplied. Streamlined bakelite case measures 3" W. x 6" H. x 2½" D. Test leads and 1½ V. size C battery included with kit. Shpg. Wt. 3 lbs.



MODEL M-1

\$14⁵⁰



\$29⁵⁰ MODEL CM-1



DIRECT READING

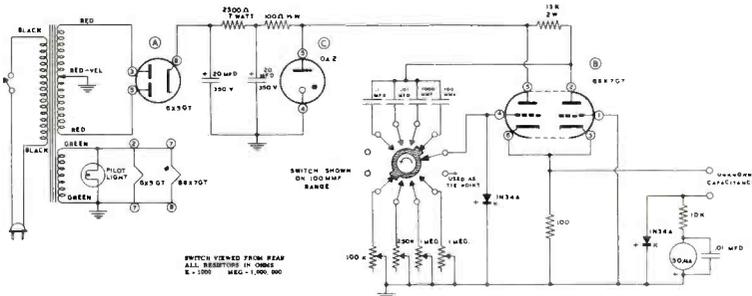
Capacity Meter KIT

FEATURES

- Reads capacity directly on 4½" 50 microampere meter.
- Four ranges—0-100 mmf, 0-1000 mmf, 0-.01 mfd and 0-0.1 mfd.
- Residual capacity less than 1 mmf—not affected by hand capacity.
- Power line operated—voltage regulation for stability.
- Precision condensers supplied for initial calibration.

SPECIFICATIONS

Ranges	0 to 100 mmf., 1000 mmf., 0.01 mfd. and 0.1 mfd. full scale.
Tubes	6BX7GT Oscillator. 6X5GT Rectifier. OA2 Voltage Regulator.
Meter	Easy to read 4½" meter with linear scale and streamlined case; 50 microampere movement.
Calibrating Condensers	± 1% for 100 and 1000 mmf. ranges. ± 2% for 0.01 and 0.1 mfd. ranges.
Power Requirements	105-125 volts AC, 50/60 cycles, 25 watts.
Dimensions	7¾" high x 4¼" wide x 4¼" deep.
Net Weight	5 lbs.
Shipping Weight	7 lbs.



For quick, accurate checks of condensers on an assembly line, in quality control, or in the service shop, the CM-1 is ideal. Extremely easy to operate, it is only necessary to connect the condenser to be checked to the terminals on the front panel, and select the proper range. The value of the condenser is then read directly on the large 4½" 50 microampere panel meter calibrated in mmf and mfd. Calibration is linear with four ranges provided, 0-100 mmf, 0-1,000 mmf, 0-.01 mfd and 0-0.1 mfd. The residual capacity is less than 1 mmf and is not affected by hand capacity. The CM-1 features a transformer operated power supply with voltage regulation for stability. Individual calibration potentiometers in conjunction with four precision capacity standards enable rapid full scale calibration in each range. Once accomplished, calibration will hold constant over extended periods of time. Standard calibrating capacitors are supplied with each instrument in the following values: 100 mmf ±1%; 1,000

mmf ±1%; 0.01 mfd ±2%; 0.1 mfd ±2%. The field of application for the CM-1 is extremely broad. Radio amateurs, audio engineers, experimenters, and hobbyists are all finding new uses for this remarkable instrument. Simplicity of operation makes bridge accuracy of capacity measurement available. It will follow the capacity change of a variable capacitor, smoothly and accurately, from the tiniest trimmer to the largest broadcast capacitor. Research and development laboratories use the CM-1 in experimental work and television receiver manufacturers are finding increasing uses for it on their production lines and for quality control. Since operation is simple and automatic, much time is saved in making repetitive capacity measurements or adjustments. The chassis layout of components allows ease of assembly. The small size and fine appearance of this unit will fit in nicely with your other equipment. Measures 7¾" H. x 4¼" W. x 4¼" D. Shpg. Wt. 7 lbs.



MODEL DR-1
\$19⁵⁰

HEATHKIT DECADE Resistance KIT

Imagine having any resistance value between 1 ohm and 99,999 ohms at your fingertips and all at 1% accuracy. That's just what you have in the Heathkit Decade Resistance Model DR-1. Twenty 1% precision resistors are neatly arranged around 5 rugged switches labeled "UNITS", "TENS," "HUNDREDS," "THOUSANDS," AND "TEN THOUSANDS." Various combinations of switch positions will provide the total range in 1 ohm steps. Use it for ohmmeter calibration, in bridge circuits, as test values in multiplier circuits and for a multitude of experimental applications. An unusually low price for a real precision device. Shpg. Wt. 4 lbs.

HEATHKIT DECADE Condenser KIT

This kit provides capacity values from 100 mmf to 0.11 mfd in 100 mmf steps so that exact capacitor values are available for determination of capacitor values in compensating networks, filters, bridge impedances, tuned circuits, etc. It is ideally suited for use in all types of design and development work.

Precision 1% silver-mica capacitors are employed for high accuracy. Switches are ceramic wafer types for minimum loss, and feature smooth action and positive detent. It must be used to appreciate its convenience, and the interesting design possibilities it presents. Shpg. Wt. 3 lbs.



MODEL DC-1
\$16⁵⁰



By Daystrom



\$31⁵⁰ MODEL BE-4

6-12 VOLT

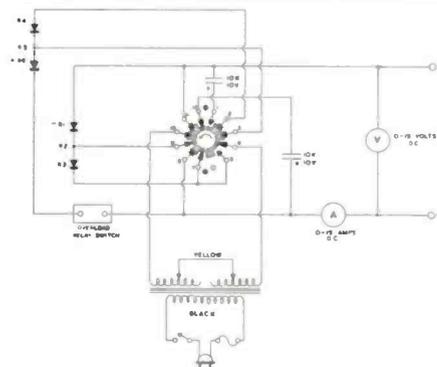
Battery Eliminator KIT

FEATURES

- Either 6 or 12 volt operation—useful also as battery charger.
- Continuously variable voltage output.
- Constant ammeter and voltmeter monitoring.
- Automatic overload relay—self resetting.
- 18 plate split-type heavy duty rectifier unit.

SPECIFICATIONS

Continuously variable voltage output	
0-8 volts DC	10 amperes continuously, 15 amperes maximum intermittent.
0-16 volts DC	5 amperes continuously, 7.5 amperes maximum intermittent.
Dimensions	13 1/4" wide x 7 1/2" deep x 7 1/4" high.
Power Requirements	105-125 V, 50-60 cycles AC at 175 watts.



This modern battery eliminator is essential for all auto radio service work. It supplies 6 or 12 volt output at a flick of the panel switch so that conventional radios or those from the new automobiles with 12-volt systems can be serviced on your work bench. This completely eliminates the necessity of keeping a storage battery on the service bench.

Voltage is continuously variable in the two output ranges; from 0 to 8 volts DC at 10 amperes continuously, or from 0 to 16 volts DC at 5 amperes continuously. It will deliver up to 15 amperes at 6 volts, or up to 7 amperes at 12 volts.

Smooth DC output is assured through the use of two 10,000 microfarad filter capacitors. Two panel meters indicate voltage and current output simultaneously.

Continuously variable output is especially valuable for determining receiver operation under other than ideal conditions. Voltage can be lowered to determine the starting point of vibrators, or the operation of the local oscillator in the receiver under adverse conditions. The power transformer winding is fuse-protected and for additional safety, an automatic relay of self-resetting type is incorporated in the DC output circuit.

The BE-4 is housed in a heavy duty steel cabinet, ventilated to allow cooling of rectifier and transformer when operating with equipment requiring high current drain. Heavy duty binding posts are provided to handle the large size wire necessary to carry the high current involved. The BE-4 can also be used as a battery charger in the auto radio service shop. Shpg. Wt. 17 lbs.

HEATHKIT

Ripple Filter KIT

The Battery Eliminator Filter model BF-1, is a ripple smoothing device to be used in conjunction with existing battery eliminators or other low voltage power supplies. It is designed primarily for use with the Heathkit model BE-4 Battery Eliminator or other comparable units. The purpose of this unit is to add extra filtering to the DC output of various battery eliminators or power supplies, so that they may be used in servicing "hybrid" car radios and other devices that derive their tube plate voltages and transistor voltages directly from the storage battery. The circuit consists of a choke and capacitor which connect to form an L-section filter. It will function at 6 or 12 volts, at up to 5 amperes maximum current. To

use merely connect the output of the battery eliminator or power supply on hand, to the input terminals on the filter plus to plus and the minus to minus. The output terminals of the filter are then connected to the unit under test. This unit is very easy to build and use. The instruction manual provided has complete step-by-step instructions plus information on its use. A copper wire table is also provided in the manual giving full particulars on safe current handling capabilities of various sizes of wire. Maximum current capacity is 5 amperes continuously or 7.5 amperes intermittently. The cabinet measures 7 3/4" H. x 4 3/4" W. x 4 1/8" D. A valuable accessory for any BE-4 owner. Shpg. Wt. 8 lbs.



MODEL BF-1
\$10⁹⁵



By Daystrom

LOW RIPPLE

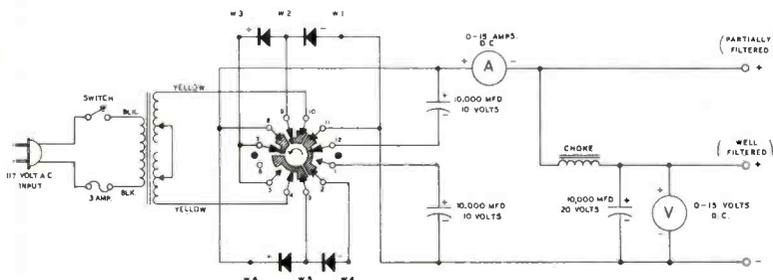
Battery Eliminator KIT

FEATURES

- Extra low-ripple filter circuit—less than .3% AC ripple.
- Separate lo-filter and hi-filter output.
- Output voltage and current monitored on panel meters.
- 6 or 12 volt operation—continuously variable output.
- Ideal for all kinds of transistor work.



MODEL **\$39⁹⁵**
BE-5



SPECIFICATIONS

- Continuously Variable Output:**
 0—8 volts DC 10 amperes continuously, 15 amperes max. intermittent.
 0—16 volts DC 5 amperes continuously, 7.5 amperes max. intermittent.
- Filtered Output Ripple:**
 6 volts DC at 5 amperes Less than 0.3%.
 12 volts DC at 5 amperes Less than 0.3%.
- Power Requirements** 105-125 volts, 50-60 cycles AC at 200 watts.
- Dimensions** 13" wide, 8½" high, 7" deep.
- Net Weight** 20 pounds.
- Shipping Weight** 23 pounds.

This brand new Heathkit Battery Eliminator is modern in the fullest sense of the word! It incorporates an extra low-ripple filter circuit so it can be used to power all the newest transistor type circuits requiring 0 to 12 volts DC, and the new "hybrid" automobile radios using both transistors and vacuum tubes. Its DC output, at either 6 or 12 volts, contains less than .3% AC ripple.

The special filter circuit is built right in and the highly filtered 6 or 12 volt DC output is available at up to 5 amperes at a separate pair of output terminals. "Hybrid" car radios and other similar devices which power their tube and transistor stages directly from the car battery, can tolerate only a small percent of ripple. In addition, the model BE-5 has another pair of output terminals for output

with a normal amount of filtering, for use as a battery eliminator on conventional-type auto radios, etc. Here, the unit will supply up to 15 amperes on the 6-volt range or up to 7 amperes on the 12-volt range. The output voltage is variable on both ranges, from 0 to 8 volts, or from 0 to 16 volts.

The BE-5 is ideal for servicing 6 or 12 volt car radios of the vibrator type, transistor type, or "hybrid" types. It will double as a battery charger, and is often used as a marine converter for small pleasure boats, or will supply voltage for small DC motors (such as electric trains), etc. It is housed in a modern case with rounded corners, and two meters on the front panel constantly monitor output voltage and output current. Shpg. Wt. 23 lbs.



MODEL **\$14⁵⁰**
VT-1

HEATHKIT

6-volt Vibrator Tester KIT

Your repair time is valuable, and the use of the Heathkit Vibrator Tester will save many hours of service work. This tester will instantly tell you the condition of the vibrator being checked, and in addition, the test is thorough and complete. Condition of the vibrator is read directly on the simple "BAD-GOOD" scale. The Heathkit VT-1 Vibrator Tester checks both interruptor and self-rectifier types of vibrators. Five different sockets are provided for checking hundreds of vibrator types.

This vibrator tester operates from any battery eliminator capable of delivering continuously variable voltage from 4-6 volts DC at 4 amperes. The Heathkit model BE-4 or BE-5 Battery Eliminator is an ideal companion piece for this tester. The kit is supplied complete, can be quickly assembled and will provide many years of time-saving service in your shop. Construction book contains vibrator test chart, providing data for testing popular vibrator types. Operating instructions printed on front panel of tester for convenient reference. Cabinet measures 10" L. x 7¼" W. x 3½" D. Shpg. Wt. 6 lbs.



By Daystrom



\$59⁵⁰ MODEL
IB-2A

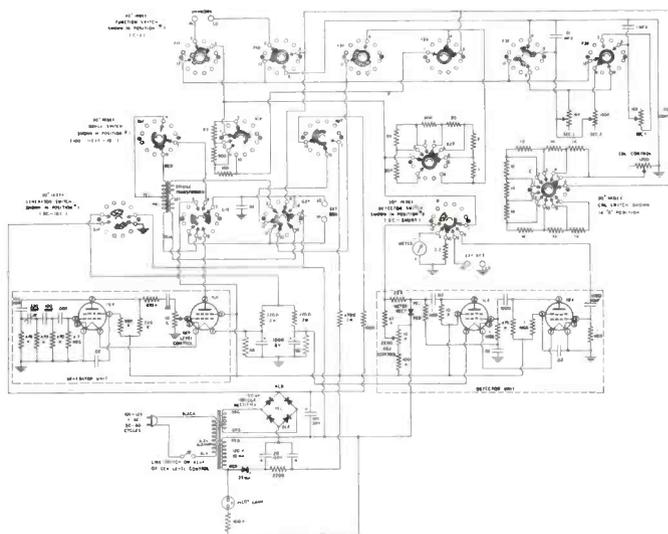
Impedance Bridge KIT

FEATURES

- Battery type tubes, no warm-up required.
- 1/2% precision resistors and silver-mica condensers.
- Built-in phase shift generator and detector amplifier.
- Slanted control panel for easy reading of controls and meter.
- High accuracy and versatility at low cost.

SPECIFICATIONS

Circuit	4-arm impedance bridge.
DC Measurements	Built-in power supply operates from 110V. AC Binding posts provided for use of external supply.
Meter	100-0-100 microampere meter.
AC Measurements	Built-in 1000 cycle generator. Terminals on panel for connection of external generator for measurement at other frequencies.
Detector	Vacuum tube detector and rectifier make use of built-in meter. Panel binding posts provide for connection to 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 of 1% decade resistors used.
Tube Complement	2-1U4 and 2-1L4.
Power Supply	Power transformer and Selenium Rectifier.
Cabinet Size	8" high x 17" wide x 6" deep.
Power Requirements	105-125 volts, 50/60 cycles, 10 watts.



Because of the low price of the Heathkit model IB-2A, it is available to the service shop, the radio amateur, and even the home experimenter.

The IB-2A is a self-contained, direct reading precision laboratory instrument designed for rapid and accurate measurement of resistors, capacitance, inductance, dissipation factors of condensers, and storage factors of inductors. It employs a Wheatstone Bridge, a Capacity Comparison Bridge, a Maxwell Bridge, and a Hay Bridge in one compact package. Measures resistance from 0.1 ohm to 10 megohms, capacitance from 100 mmf to 100 mfd, inductance from 0.1 millihenry to 100 henries, dissipation factor (D) from 0.002 to 1, and storage factor (Q) from 0.1 to 1,000. A 100-0-100 ua meter provides for null indications. The usual headset or other devices for such measurements are not necessary although provision is made for using an external detector when desirable. The decade resistors employed are of 1/2% tolerance for high accuracy.

The IB-2A has its own built-in power supply, 1,000 cycle phase shift generator, and a vacuum-tube detector. A special 2-section CRL dial insures convenient operation. Provision is also made for connecting an external generator for measurements at audio frequencies other than 1 kc. Battery-type tubes are used so that a warm-up period is not required and measurements can be made quickly. They also eliminate changes in operating characteristics due to thermal effects.

The instruction manual has entirely new schematics that clarify circuit functions in various switch positions. A true laboratory instrument, that will provide you with many years of fine performance. Shpg. Wt. 12 lbs.

HEATHKIT

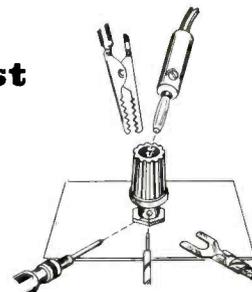
Binding Post KIT . . .

This sketch clearly shows the universal manner in which Heath binding posts will accommodate an alligator clip, banana plug, test lead pin, spade lug or wire.

To accommodate customer requests a binding post kit is now available. The kit is sold only in units of twenty complete binding post assemblies; ten red and ten black insulator caps. Consists of binding post base, fluted cap, flat fiber washer, shoulder fiber washer, solder lug and 6-32 nut; 120 pieces in all.

Shipping wt. 1 pound. Binding post kit #362-A at

\$4.00



PARCEL POST RATE TABLE

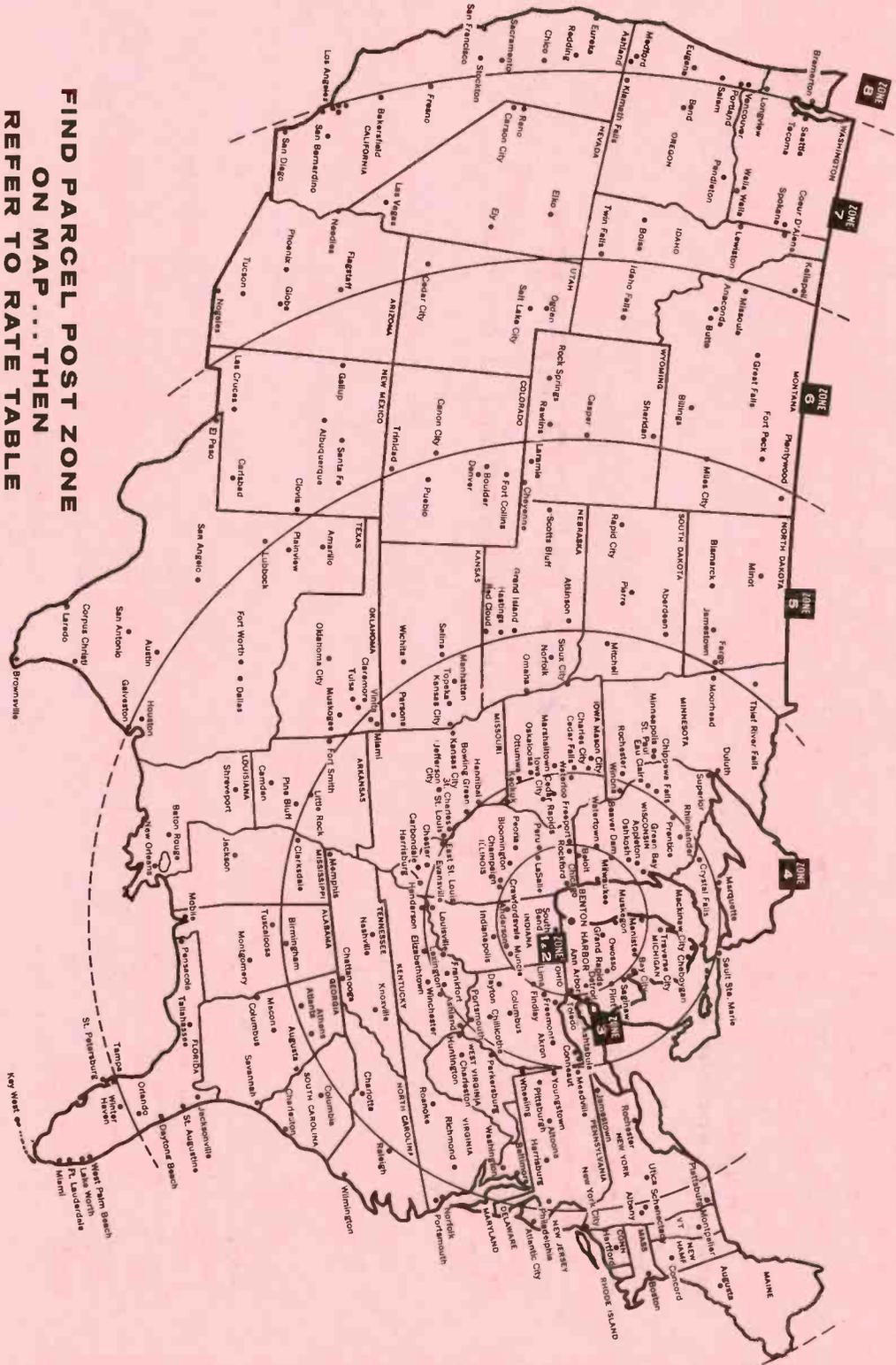
Postal Regulations . . . limit parcel post shipments to 20 pounds to zones 3 to 8, and 40 pounds to zones 1 and 2. EXCEPTION: Shipments up to 70 pounds will still be accepted to RFD addresses, and to APO numbers.

Ship. Wt.	Local 1 & 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Zone 8
to 1 lb.	\$.18	\$.23	\$.24	\$.26	\$.28	\$.30	\$.32
2 lbs.	.20	.27	.29	.36	.40	.46	.51
3 lbs.	.21	.31	.34	.45	.52	.61	.69
4 lbs.	.23	.35	.39	.53	.64	.76	.87
5 lbs.	.24	.39	.44	.63	.76	.91	1.05
6 lbs.	.26	.43	.49	.73	.88	1.06	1.23
7 lbs.	.27	.47	.54	.82	1.00	1.22	1.41
8 lbs.	.29	.51	.60	.91	1.12	1.37	1.59
9 lbs.	.30	.55	.65	.96	1.24	1.52	1.77
10 lbs.	.32	.59	.70	1.10	1.36	1.67	1.95
11 lbs.	.33	.63	.75	.93	1.19	1.48	1.82
12 lbs.	.34	.67	.80	1.00	1.28	1.58	1.98
13 lbs.	.35	.71	.85	1.07	1.37	1.72	2.13
14 lbs.	.37	.75	.90	1.14	1.47	1.84	2.29
15 lbs.	.39	.79	.96	1.21	1.56	1.96	2.43
16 lbs.	.40	.83	1.01	1.28	1.65	2.08	2.58
17 lbs.	.42	.87	1.06	1.35	1.74	2.20	2.74
18 lbs.	.43	.91	1.11	1.42	1.84	2.32	2.89
19 lbs.	.45	.95	1.16	1.49	1.93	2.44	3.04
20 lbs.	.46	.99	1.21	1.56	2.02	2.56	3.19

CANADIAN POSTAGE RATES
 First Pound \$.45
 Each Additional Pound \$.22

DISTANCE FROM BENTON HARBOR

Local Zone.. In Benton Harbor
 Zones 1 & 2.... not over 150 mi.
 Zone 3..... 151 to 300 mi.
 Zone 4..... 301 to 600 mi.
 Zone 5..... 601 to 1000 mi.
 Zone 6..... 1001 to 1400 mi.
 Zone 7..... 1401 to 1800 mi.
 Zone 8..... Over 1800 mi.



FIND PARCEL POST ZONE ON MAP... THEN REFER TO RATE TABLE

at left for the correct amount to include in your remittance for postage. For example, if your order adds up to 16 lbs. and you live in Zone 2, the postage on your merchandise would be .83c. If you do not know your postal zone, ask your postmaster.

**USE THIS HANDY ENVELOPE
WHEN ORDERING**

Fold, enclose order blank with remittance
seal, stamp and mail.

PLACE
STAMP
HERE

**HEATH COMPANY
BENTON HARBOR, MICHIGAN**

NAME

ADDRESS

CITY & STATE

**INCLUDE
MONEY FOR POSTAGE**

with your orders as we must pay postage on parcel post packages before we can send your merchandise. Don't worry about sending more than the correct amount—if you send us too much, every cent extra will be promptly returned to you. You pay only the exact postage needed for your order.

NOTE—To provide additional savings and faster service in filling your order, Insurance fees on Parcel Post shipments have been discontinued. In event you have a damage claim, write directly to the HEATH CO. and not to the post office.

- BEFORE SEALING...**
- Have you:*
- a) Filled out order blank completely?
 - b) Included postage with remittance on cash order?
 - c) Completed credit form for time payment order?

FOLD 4

FOLD 3

FOLD 1

FOLD 2

Heath's Easy Time Payment Plan

Time Payment Plan available only on orders having cash price of \$90.00 or more.
Available in the Continental United States and the Hawaiian Islands only.

In order to assure prompt shipment of your new Heathkit under the Time Payment Plan, please observe the following instructions.

- 1 First fill out section "B" of the Order Blank on the reverse side of this sheet, designating the Heathkits you wish to buy. If your order totals \$90.00 or more, you may use the Time Payment Plan.
- 2 Insert the amount of your down payment in the Time Payment Agreement below (at least 10% of your total order). A larger down payment reduces carrying charge and monthly payment.
- 3 Refer to the amounts on the Easy Payment Chart which correspond to the unpaid balance on your order (total price of order less down payment). From this chart enter your monthly payments on the Time Payment Agreement.
- 4 Sign your Time Payment Agreement in ink with your usual signature, and fill in the credit statement completely.
- 5 Send this application and your down payment to Heath Company, Benton Harbor, Michigan.

EASY PAYMENT CHART					
Unpaid Balance	Carrying Charge	Up To 12 Monthly Payments*	Unpaid Balance	Carrying Charge	Up To 12 Monthly Payments*
less than \$50	\$ 5	\$ 5	\$170.01-180	\$18	\$17
\$ 50.01-60	6	6	180.01-190	19	18
60.01-70	7	7	190.01-200	20	19
70.01-80	8	8	200.01-210	21	20
80.01-90	9	9	210.01-220	22	21
90.01-100	10	10	220.01-230	23	22
100.01-110	11	11	230.01-240	24	22
110.01-120	12	11	240.01-250	25	23
120.01-130	13	12	250.01-260	26	24
130.01-140	14	13	260.01-270	27	25
140.01-150	15	14	270.01-280	28	26
150.01-160	16	15	280.01-290	29	27
160.01-170	17	16	290.01-300	30	28

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

WRITE FOR FURTHER INFORMATION IF YOU WISH TO ADD ON TO YOUR PRESENT ACCOUNT

TIME PAYMENT AGREEMENT

Please answer all questions fully to help establish your credit promptly. Write your order on the reverse side.

NOTE: Time payment agreement cannot be accepted from persons under 21 years of age. If you are under 21, have this form filled out by a person of legal age, regularly employed or engaged in business. He can make the purchase for you, and will be responsible for payment.

TO: HEATH COMPANY BENTON HARBOR, MICHIGAN

Enclosed is a deposit of \$ _____ on the Easy Payment cost of the equipment on the reverse side. I will pay \$ _____ each month to you at the above address starting 30 days after shipment, until the total time payment price is paid.

Title to and right of possession of said equipment shall remain with you until all payments have been made. Upon default on any payment due on this contract, the full amount unpaid hereon, at your option, shall become immediately due and payable and you may either hold me liable for said amount or repossess the equipment. If you shall repossess, all payments made may be retained as rent for the use and depreciation of said equipment. The loss, injury or destruction of the equipment after I have received it shall not operate as payment or in any manner release me from any obligation hereunder.

If this order is not accepted, you shall refund the down payment with notice of non-acceptance. Acceptance shall be effected when the equipment designated on the reverse side hereof is shipped to me. I certify that all statements in the Credit Statement set forth below are true and complete and are made for the purpose of obtaining credit. This contract is to be governed by the laws of the State of Michigan.

Enter Date _____ Sign Here _____

CREDIT STATEMENT

(IMPORTANT: Please fill in completely. Omissions and errors cause delays.)

FULL NAME _____ (Print) Age _____ Military Serial No. _____ (if serviceman)

WIFE'S NAME _____ (Print) No. of Children and names _____

Residence _____ City _____ State _____ How Long _____

Own or Buying Rent Live with Parents No. of Rooms _____ Paid Monthly \$ _____ Phone No. _____

Landlords Name (If Owned and Address (Mtg. Held By) _____

Previous Address _____ How Long _____ Previous Address _____ How Long _____ (If less than 3 years at present address)

Previous Landlord _____ Address _____ Business Phone No. _____

Employed by _____ Address _____ Dept. or Badge No. _____ Salary \$ _____

Position _____ How Long _____ Previous Employer _____ How Long _____ (if less than 3 years at present employment)

Wife's Employer _____ Address _____ Phone _____

Position _____ How Long _____ Dept. or Badge No. _____ Salary \$ _____

Other Income— Give Details _____ Total Family Income \$ _____

CREDIT REFERENCE (Give Your Bank and 2 Merchants, Firms or Finance Companies with whom you do or have done business.)

Your Bank _____ Address _____	Type of Account _____
First Credit Reference _____ Address _____	Present Balance \$ _____ Monthly Payment \$ _____
Second Credit Reference _____ Address _____	Present Balance \$ _____ Monthly Payment \$ _____

Nearest Relative _____ Address _____ Relationship _____ (Do not list those with whom you are living)



By Daystrom

"Q" Meter KIT

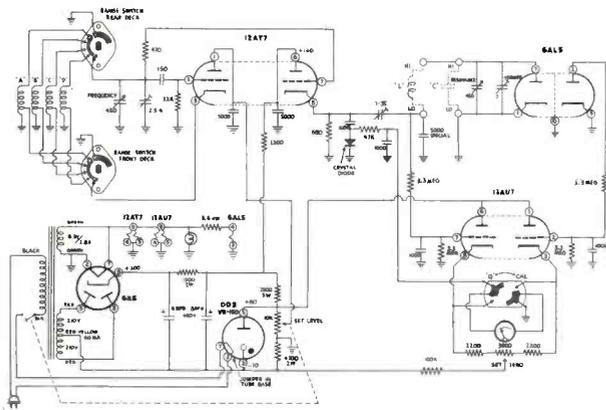


MODEL
QM-1

\$44⁵⁰

FEATURES

- Variable oscillator permits testing components at normal operating frequencies (150 KC—18MC).
- Large 4½" meter mounted in slanted panel for easy reading.
- Pre-wound RF coils—all sheet metal formed and punched.
- No special equipment required for calibration—test coil furnished.



The Q Meter is not just a "prestige" instrument to be dusted off each morning when opening the shop or lab. It is fully capable of performing many tasks in a matter of minutes that ordinarily require considerable mechanical and mathematical dexterity. Originally a Q meter was out of financial reach of the average service shop but now Heathkit ingenuity has brought it into line.

Suspected components and parts being developed or manufactured can be tested at frequencies at which they normally are used (150 kc to 18 mc). Wide ranges of inductance, capacitance and Q will cover practically all values encountered. All indications are read directly on a large 4½", 50 microampere, panel-mounted meter.

SPECIFICATIONS

Frequency	150 kc—18 mc on 4 bands.
Inductance	1 microhenry to 10 millihenry.
Q	250 Full scale x 1 or x 2.
Capacitance	Actual 40 mmf—450 mmf Effective 40 mmf—400 mmf Vernier ± 3 mmf.
Tubes	1—12AT7, 1—6AL5, 1—12AU7, 1—6X5, 1—OD3/VR150.
Power	105-125 Volts AC, 50-60 cycles, 30 watts.
Dimensions	8" high, 17" wide, 6" deep.

Surprisingly easy to use, the model QM-1 will take the guesswork out of your electronic efforts.

The Heathkit Q Meter uses a 12AT7 oscillator with pre-wound coils to obtain the full frequency range on four bands. Oscillator output is metered to provide constant injection. A complete VTVM circuit is used as a resonance indicator, using a 6AL5 twin diode and a 12AU7 VTVM amplifier. Voltage regulated and transformer operated power supply utilizes a 6X5 full wave rectifier and an OD3 regulator tube. All other components are of the highest quality. Behind the attractive charcoal gray panel with white lettering is a well laid out and factory-formed chassis. No "extras" are required to build or operate this instrument. A special test coil is provided for calibration purposes. Shpg. Wt. 14 lbs.



MAIL ORDER AND YOU!

The Heath Company is strictly a Mail Order firm and specializes in sales directly between consumer and factory. Since this is not merely a sideline with us we are geared for fast, efficient order handling. Years of experience have developed new methods of handling orders and material to give you the best service possible—yet each order is still given personal attention. Factory-to-you sales also assure you of getting the latest type equipment available instead of outdated equipment collecting dust on distributor shelves. As a further saving, you pocket the middleman's profit. We stand behind our product so your satisfaction is guaranteed.



By Daystrom



\$35⁵⁰ MODEL PS-3

VARIABLE VOLTAGE REGULATED

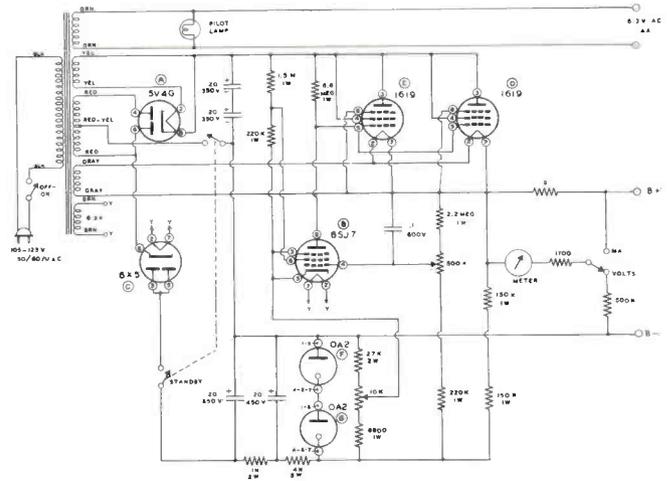
Power Supply KIT

FEATURES

- DC output variable from 0 to 500 volts.
- Large 4½" meter monitors output voltage or current.
- Regulated output—Low-ripple—Convenient operation.
- Provides filament voltage of 6.3 VAC at 4 amperes.
- Professional performance and appearance.

SPECIFICATIONS

Output	Continuously variable from 0 to 500 volts no load
Regulation	(With 117V AC Line) Linear from 0 to 10 ma at 450 volts output Linear from 0 to 20 ma at 400 volts output Linear from 0 to 40 ma at 350 volts output Linear from 0 to 70 ma at 300 volts output Linear from 0 to 100 ma at 250 volts output Linear from 0 to 130 ma at 200 volts output
Meter	4½" streamlined case, 1 ma full scale, 0—500V DC, 0—200 ma DC
Tubes	1—5V4G rectifier, 1—6X5GT rectifier, 2—OA2 regulator tubes, 2—1619 control tubes, 1—6SJ7 control amplifier
Power Requirements	105-125V AC, 50-60 cycles, 90 watts
Dimensions	8½" high, 13" wide, 7" deep
Shipping Weight	17 pounds



Experimenters and those involved in the design of electronic equipment, or new circuits, will find the PS-3 invaluable in their work. This unit eliminates the need for building up a separate power supply for each new circuit tried. It supplies DC plate voltage and AC filament voltage. The DC output is continuously variable from 0 to 500 volts no-load depending on setting of voltage control on the front panel. The voltage is indicated on the large easy-to-read 4½" panel meter, which also indicates current drawn by the load. A panel switch is provided for voltage or current readings. The PS-3 provides up to 10

ma at 450 volts DC or up to 130 ma at 200 volts DC. Current progressively increases as voltage is lowered. Provision is also made for 6.3 volts AC at up to 4 amperes for filaments, with separate terminals provided on the front panel. The output terminals are insulated from ground so it may be used for AC-DC work. Voltage regulation is excellent, and a convenient standby switch is provided in addition to the on-off power switch. The PS-3 features rugged, well-rated components throughout. Once you use a power supply like this one, you'll want one for your own work bench. Shpg. Wt. 17 lbs.

HEATHKIT 6-VOLT AND 12-VOLT

Vibrator Power Supply KIT

Now you can obtain either a 6-volt or 12-volt vibrator power supply in kit form. These little power supply kits were designed to replace the power supplies of receivers, small public address systems, or even miniature transmitters, so that they can be used with conventional 6 or 12 volt batteries. They are ideal for use in boats, automobiles, light aircraft or in many field applications. Each unit provides 260 volts DC output at up to 60 milliamperes. More than one power supply of the same model may be connected in parallel for increased current capacity at the same output voltage! Vibrator frequency is approximately 115 CPS, and each power supply measures only 4½" H. x 4" W. x 3¾" D. Everything is provided, including vibrator transformer, vibrator, tubes and filters. Easy to build in just a few hours. Shpg. Wt. 4 lbs.

6-Volt
Model VP-1-6
12-Volt
Model VP-1-12
\$7⁹⁵ each





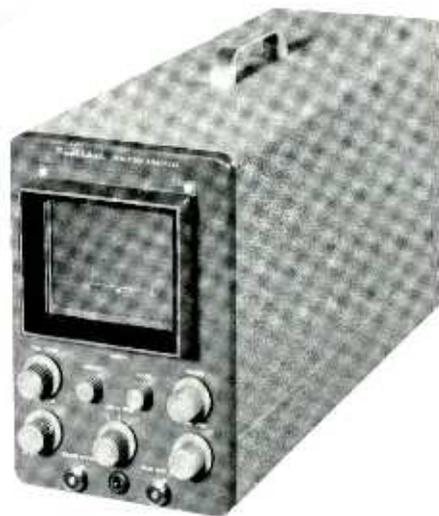
By Daystrom

ELECTRONIC

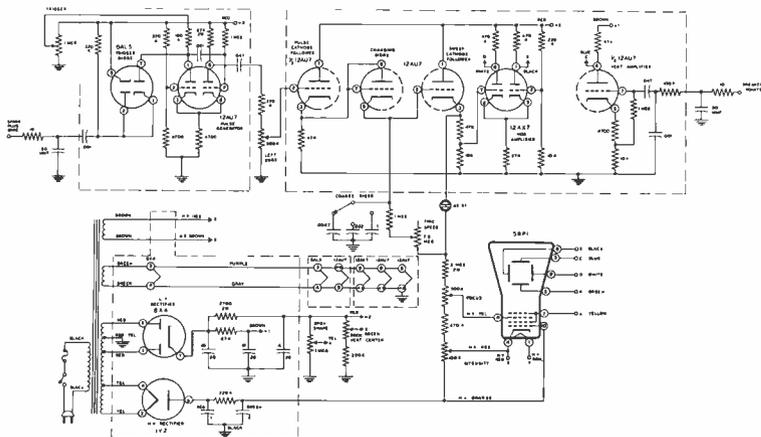
Ignition Analyzer KIT

FEATURES

- Checks ignition system electronically with engine in operation.
- Displays ignition waveform on cathode-ray-tube—quickly indicates defect.
- Use to locate ignition trouble or to adjust for best performance.
- Easy-to-build—simple to operate.
- A wonderful new tool for the auto mechanic or auto hobbyist.



MODEL IA-1 \$59⁹⁵



SPECIFICATIONS

- RPM Range 400-5000.
- Display Shows:
 - Directly Voltage across breaker points.
 - Indirectly Current in coil secondary.
- Screen Size 3" x 4".
- Standard Pattern Height:
 - 6-volt 1" approximately.
 - 12-volt 1½" approximately.
- Test Lead Lengths 10 feet each to breaker points and to spark plug wire.
- Controls Vertical position, intensity, focus, trigger level, power and left edge position, coarse speed, fine speed.
- Tube Complement 5BP1, 1V2, 6X4, 6AL5, 12AX7, (3) - 12AU7.
- Power Requirement 105-125 volts AC, 50/60 cycle, 35 watts.
- Dimensions Overall 6½" x 11" x 20".
- Weight of Instrument 16 pounds.
- Shipping Weight of Kit 20 pounds.

Here is a wonderful new tool for engine mechanics, tune-up men, and auto hobbyists. It is ideal for the service and analysis of ignition systems. The IA-1 traces the dynamic action of voltage in an ignition system on a fluorescent cathode-ray-tube screen. Since the waveform produced is affected by the condition of the coil, condenser, points, plugs, and ignition wiring. It can be analyzed, and used as a "sign-post" to ignition system performance.

For example, this analyzer will show the existence of such conditions as inequality of spark intensity, a poor spark plug, defective plug wiring—and will even identify the offending plug or wire. Also, it will detect breaker-point bounce, an open condenser, or will allow the setting of dwell-time percentage for the points. These are a few of the most obvious applications. More subtle wave characteristics will show other ignition system performance factors, as experience is gained by the operator. The IA-1 is simple to use, with a minimum of controls—yet is completely flexible for all types of internal combustion engines where breaker points are accessible. Use it on automobiles, boats, aircraft engines, etc.

An important feature of this instrument is its ability to check the dynamic performance of the ignition, with the engine in operation (400 to 5,000 RPM). It will show the complete engine cycle, or just one cylinder. The IA-1 is especially helpful in locating stubborn defects which may show up only when the vehicle is in motion and under load, if a vibrator-type converter is used to supply 115 VAC power for the analyzer!

Since the IA-1 is primarily intended for mechanics who generally

have not had previous experience with instruments of this type, special attention has been given the construction manual. Easy to understand step-by-step instructions are provided as well as plenty of detailed drawings showing the exact placement and value of each component. All components are marked as to their value for easy identification. A wiring harness is also supplied, greatly simplifying the wiring procedure and also gives a professional appearance to the wiring. The IA-1 is ruggedly constructed. All chassis components are made of heavy-gauge metal and an all-steel case is provided to withstand rough usage. The cathode ray tube is protected by a sheet of clear plastic material. The front panel is attractively screened with the function of each control clearly marked. The controls consist of: vertical position, intensity, focus, trigger level, power and left edge position, coarse speed, and fine speed. Two test leads are supplied, each ten feet long, to reach the breaker points and spark plug wire. The IA-1 can be conveniently located either on a table next to the engine or can be placed on the fender for easy viewing. Information on how to use the analyzer is also given in the construction manual, such as how to connect it to the engine under test, and what to look for in the waveform obtained. Examples are given showing the normal waveform and the waveform obtained on a faulty engine. As the operator continues to use the IA-1, operation of the controls will become second nature, as will his interpretation of the waveforms. This easy-to-build instrument will help you make faster and more efficient engine tuneups or repairs. Shpg. Wt. 20 lbs.



By Daystrom

Broadcast Band RADIO KIT

FEATURES

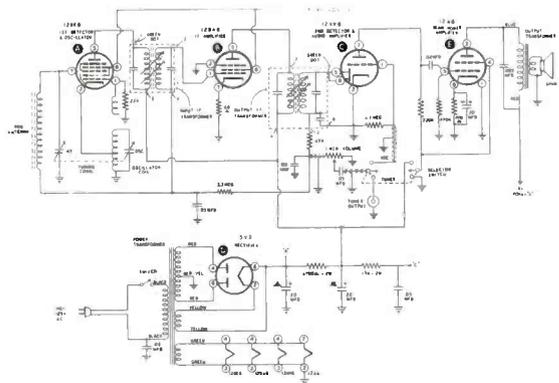
- Can be used as receiver, tuner, or phono amplifier.
- Efficient, rod-type built-in antenna provides high sensitivity.
- High-gain IF transformers and miniature tubes for excellent performance.
- Transformer operated power supply for safety and efficiency.
- Slide-rule dial — 5½" PM speaker.

\$18⁹⁵

MODEL BR - 2
(less cabinet)

SPECIFICATIONS

Radio	
Tuning Range	550 kc to 1620 kc.
IF Frequency	455 kc.
Antenna	Built-in High Sensitivity Rod Type.
Speaker (included)	5½" PM, 4-ohm Voice Coil.
Tuner Operation Output	High impedance to any amplifier input with resistance of 100,000 ohms or more. 110 V outlet provided for amplifier, phono player, etc.
Phonograph Input	1 megohm high impedance for optimum performance with any good quality crystal or ceramic phono pickup.
Tube Complement	1—5Y3 Rectifier. 1—12A6 Beam Power Amplifier. 1—12AV6 Detector A.V.C. and Audio Amplifier. 1—12BA6 IF Amplifier. 1—12BE6 Pentagrid Converter.
Power Requirements	105-125 volts, 50-60 cycles, AC, 40 watts.
Dimensions	11½" wide, 5¾" high, 6¾" deep.



If you have ever had the urge to build your own radio receiver, the outstanding features of this popular Heathkit deserve your attention. Designed as a completely useful radio construction project, and yet capable of constant daily performance, the Heathkit BR-2 is designed especially for easy construction by the beginner without sacrificing quality or performance in any way.

Your success is assured by the completely detailed information contained in the construction manual. Not only does the manual outline simple, easy-to-follow, step-by-step assembly procedure, but a basic explanation of circuit theory is incorporated as the work progresses and the receiver develops at your finger tips. This specially prepared construction manual represents a basic radio education course in itself and is of particular use to novices and students.

Large pictorial diagrams and schematic diagrams can be pinned over the work bench during construction. The manual even contains information on resistor and capacitor color codes, soldering techniques, use of tools, etc. Tunes from 550 kc to 1600 kc and features a transformer operated power supply for safety of operation. High-gain miniature tubes, sharply tuned IF transformers and a new rod-type built-in antenna, result in high sensitivity, good selectivity, and unusually fine tone quality. This unit can be wired for use either as a receiver, tuner, or phono amplifier. Shpg. Wt. 10 lbs.

Cabinet: This attractive plastic-impregnated fabric covered plywood cabinet is available for the BR-2 Receiver. Complete with aluminum panel, flocked reinforced speaker grille, and protective rubber feet. Shpg. Wt. 5 lbs. Part no. 91-9A. **\$4.95**

HEATHKIT

Crystal Radio KIT

This crystal radio is just the ticket for construction by young people interested in radio or electronics —yet it is definitely not a toy. Employs high-quality standard components throughout. It is even usable as an AM tuner in high fidelity applications.

Covering from 540 to 1600 kc, the CR-1 has two high-Q tank circuits that employ ferrite core coils and conventional air tuned capacitors. Capacitors are tuned individually to the desired station. The receiver is most attractively styled in a black bakelite case. Uses a sealed germanium diode for detection—no critical "cats whisker" adjustment. Includes a pair of high impedance earphones. Requires no external power. Could prove extremely valuable for emergency reception of civil defense signals, should there be a power failure. The construction manual provides the builder with the basic fundamentals of signal reception so that he understands how the crystal receiver functions. An interesting and valuable "do-it-yourself" project for all ages. Shpg. Wt. 3 lbs.



MODEL CR - 1

\$7⁹⁵



By Daystrom

TRANSISTOR

Portable Radio KIT

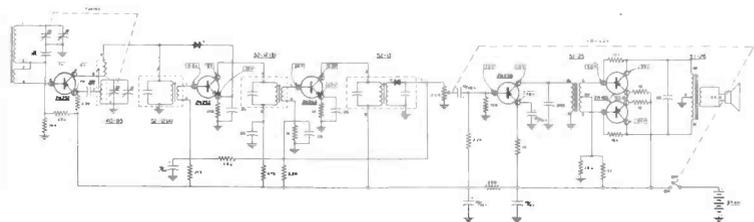
FEATURES

- Six name-brand (Texas Instrument) transistors plus two diodes.
- High-quality 4" x 6" speaker for "big set" tone.
- Long battery life (500-1000 hours) with standard flashlight cells.
- Unbreakable molded plastic cabinet with "formed-in" handle.



MODEL XR-1
(less batteries, with cabinet)

\$34⁹⁵



SPECIFICATIONS

Tuning Range	538-1680 kilocycles.		
Cabinet	Unbreakable plastic with "formed-in" handle. Holiday Gray with Gold Trim.		
Size	9" L x 8" H x 3 3/4" D.		
Loudspeaker	4" x 6", 1.47 oz. magnet.		
Batteries	6 Size "D" flashlight cells (not included). 500-1000 hours average use.		
Transistors	6; 1-2N252	1-2N253	1-2N254
	1-2N238	2-2N185	plus 2 diodes.
Weight with Batteries	4 3/4 pounds.		
Shipping Weight	6 pounds.		

Heath engineers set out to develop a "universal" AM radio, suitable for use anywhere. Their objective was a portable that would be as much "at home" inside as it is outside, and would feature top quality components for high performance and long service life. The model XR-1 is the result of these efforts.

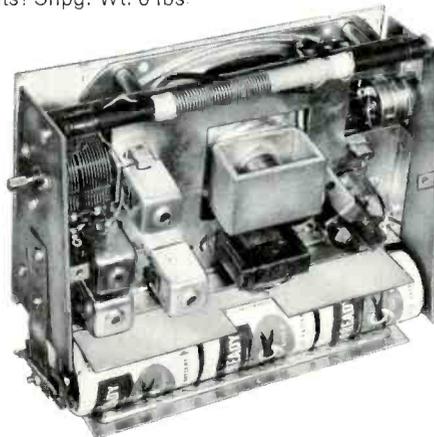
Six name-brand (Texas Instrument) transistors were selected for good sensitivity and selectivity. A 4" x 6" PM speaker with heavy magnet was chosen to insure fine tone quality. The power supply was designed to use six standard, size "D" flashlight cells because they are readily available, inexpensive, and because they afford extremely long battery life (between 500 and 1000 hours). This power supply also eliminates shock hazard since highest voltage in set is only 9 volts. Unbreakable molded plastic was selected for cabinet material because of its durability and striking beauty.

These important features make the XR-1 equal to the finest transistor portable radios you can buy, yet it sells for less than many of the novelty portables that provide only minimum performance.

The Heathkit XR-1 Transistor Receiver emphasizes top performance at a low kit price. It features class B push-pull output for maximum efficiency and best battery economy. It costs you no more to operate from batteries than what you would pay for operating a small table-model radio from the power line. Built-in rod-type antenna allows excellent reception in all locations. The IF circuits are prealigned so the receiver is ready to operate as soon as construction is completed. Receiver can be peaked up on station if desired for maximum efficiency by following simple instructions in manual, and an alignment tool is furnished. No special alignment equipment is required. The circuit is compact and efficient, yet components are not excessively crowded, adding greatly to the ease of construction.

Use the XR-1 as an automobile radio, for fishing and camping trips, at the ball park, on vacation, or at the beach. Perfect for a civil defense standby set, and a reliable source of signals in case of power failure. It represents a new concept in design, in that you get convenience and portability without the usual sacrifice in performance.

The attractive, light-weight, plastic cabinet is unbreakable with a "formed-in" handle for ease of carrying. It resists scuffs, peeling, chipping, chemicals and grease. Cabinet dimensions are 9" L. x 8" H. x 3 3/4" D. Comes in holiday gray with gold-anodized metal speaker grille. Compare this portable, feature-by-feature, to all others on the market, and you'll appreciate what a tremendous dollar value it represents! Shpg. Wt. 6 lbs





MODEL ES-400
CABINET

**FULL COMPUTER
GROUP C**

\$945⁰⁰ Complete

Write for further information



By Daystrom

ELECTRONIC

Analog Computer KIT

FEATURES

- One standard reference supply for amplifier DC voltages.
- A nulling meter for accurate setting of computer voltages.
- A unique patch-board panel which enables the operator to "see" his computer block layout.
- 30 coefficient potentiometers—2-10 turn precision auxiliary potentiometers.

TYPICAL GROUP

FULL COMPUTER KIT—GROUP C \$945

CONSISTS OF:

One	ES 2	Amplifier power supply kit
One	ES 50	Reference power supply kit
Three	ES 100	Initial condition power supply kits
One	ES 151	Relay power supply kit
Fifteen	ES 201	Operational amplifier kits
One	ES 400	Cabinet kit
One	ES 401	Voltage regulator transformer kit
Three	ES 405	Patch cord kits
Two	ES 447	Coefficient potentiometer kits
One	ES 450	Auxiliary coefficient potentiometer kit
One	ES 505	Repetitive oscillator kit

OTHER GROUPS AVAILABLE:

BASIC COMPUTER KIT—GROUP A \$495

MEDIUM COMPUTER KIT—GROUP B \$775



MODEL ES-2
AMPLIFIER
POWER SUPPLY



MODEL ES-100
INITIAL CONDITIONS
POWER SUPPLY



MODEL ES-201
AMPLIFIER



MODEL ES-151
RELAY
POWER SUPPLY



MODEL ES-505
REPETITIVE
OSCILLATOR



This is a highly flexible and accurate analog computer, designed to fill requirements not presently met by any commercial computer. It is an instrument suitable for use as a design tool in industry and universities. An advance "slide rule" which permits engineering or research personnel to simulate equations or physical problems electronically and save many hours of calculation or experimentation. Ideal for solving practical problems in industry, and equally valuable for research, or instructional demonstrations, in colleges and universities.

Because it is a kit, and the labor and overhead cost found in present day computers are eliminated, the Heath computer can be obtained for use in situations where a computer was ruled out in the past because of cost. Definitely not a "gadget" but a high quality, flexible, high-accuracy device designed to work for you.

The ES-400 computer cabinet houses power supplies, amplifiers, and computing components. It includes an accurate dividing network which introduces voltages to a null meter. By means of a switch, a potentiometer may be connected to the meter and read. This eliminates inaccuracy due to potentiometer non-linearity, or loading.

The dividing network and meter may also be used to set up the initial conditions, to offset bias diodes, and to read any voltage which appears at the amplifier. The meter may be switched to any of the fifteen amplifiers so they may be set to give full scale deflection of ± 2 , 20 and 100 volts. The board also has the plus and minus 100-volt standard available, which is used in dividing the network.

The Heathkit Analog Computer is available in three different groups at three different price levels, depending on the number of amplifiers required, etc. The basic computer group, with five amplifiers, sells for only \$495.00, there is a medium group for only \$775.00, and the full computer, with fifteen amplifiers and other extras is priced at only \$945.00.

ES-600 FUNCTION GENERATOR KIT



The model ES-600 Function Generator is designed to be used with the Heath Analog Computer. The unit approximates curves or functions by straight line segments, five in the plus X direction and five in the minus X direction. The break voltage and slope of the segments are set by controls on the front panel. Power requirements are: +250 V at 16 MA; -250 V at 16 MA; 117 V AC at 100 MA.

FREE FOLDER:

Complete details concerning the Heathkit Electronic Analog Computer Kit are available free on request. This folder explains exactly what each computer group consists of, and explains the function of each element in the group. Send for your free copy now and get the complete computer story.



By Daystrom

PROFESSIONAL

Radiation Counter KIT

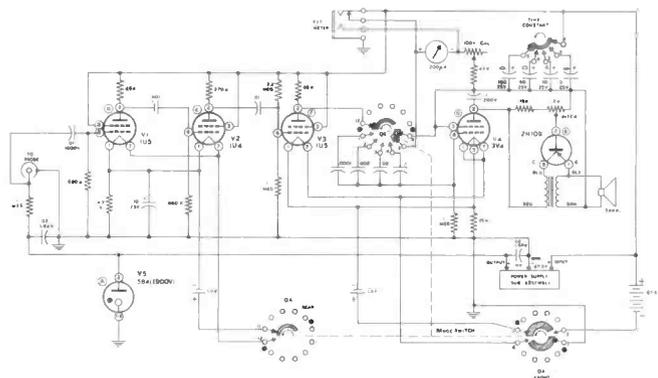
FEATURES

- Completely modern design for maximum sensitivity and reliability.
- Both visual (4½" meter) and aural (panel mounted speaker) indicators for radiation level.
- Meter calibrated in CPM and MR/HR. Four measuring ranges.
- Safe, radio-active sample provided for calibration.
- Employs 900 volt bismuth tube in beta/gamma sensitive probe.



MODEL
RC-1

\$79⁹⁵



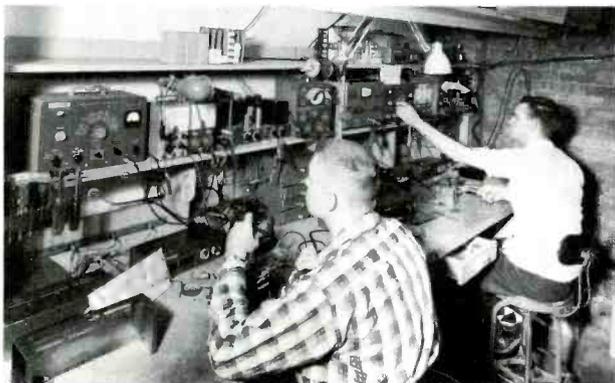
The Heathkit model RC-1 Radiation Counter is a deluxe geiger counter priced far below comparable units. You save by "building it yourself". Complete step-by-step instructions are combined with giant-size pictorial diagrams showing the exact placement and value of each component.

The RC-1 provides high sensitivity with ranges of 0-100, 600, 6,000, 60,000 counts-per-minute, and 0-.02, .1, 1 and 10 milliroentgens per hour. A 900-volt bismuth tube is employed in a beta/gamma sensitive probe. Probe and 8-foot expandable cable are included in kit price, along with a safe radiation sample used for calibration. Response to radiation is indicated on a large 4½" panel meter and on a self contained speaker which produces beeps or clicks on the most sensitive range. The meter is calibrated in CPM or MR/hour.

SPECIFICATIONS

Time Constant	0.5, 1, 5 and 10 seconds.
Ranges	0-100, 600, 6000 and 60,000 counts per minute. 0-.02, .1, 1, and 10 milliroentgens per hour.
Probe	Satin aluminum and chrome plated steel probe contains extra sensitive type 6306 Bismuth geiger counter tube.
Batteries	1-67½ volt B battery (approximately 200 hours to 40 volt end point), intermittent operation. 2-1½ V A batteries (approx. 20 hours to 1V end point), intermittent operation.
Tube Complement	1-1U4) Amplification, pulse 1-3V4) shaping and counting 2-1U5) tubes. 1-5841 corona regulator tube. 1-6306 Bismuth counter tube. 1-2N109 transistor (oscillator).
Dimensions	9½" High x 6½" Wide x 5" Deep.

The prebuilt "packaged" high voltage power supply has reserve capacity above the 900 volt level at which it is regulated. A separate control enables instant choice of time constant, from ½ to 10 seconds. Merely changing the regulator tube type would allow use of a scintillation probe if desired for extra sensitivity. Provision is made for use of an external meter when prospecting from a moving vehicle. The RC-1 employs five tubes (plus a transistor) to insure stable and reliable operation. In addition to its value in prospecting for uranium ore the RC-1 has found extensive use in radiological laboratories, and for civil defense to detect radioactive fallout, or other unknown radiation levels. The RC-1 fulfills the requirements of the seriously interested individual who wants a prospecting tool on which he can rely. Kit price includes batteries. Shpg. Wt. 8 lbs.



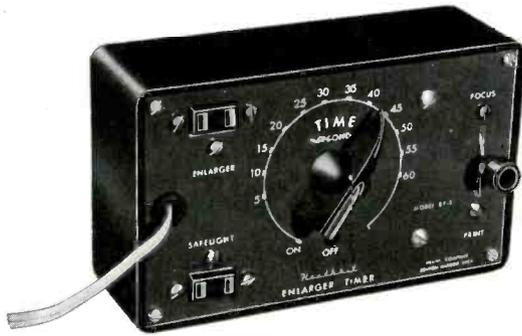
SERVICE DEPARTMENT . . .

An extra assurance of successful kit construction is the availability of our consultation service or service department. You can write for additional help in case of difficulty, or you can send equipment to our service department for a complete factory check of operation at a nominal fee. Factory-trained technicians will quickly spot a wiring error or mistake and correct it. Any damaged components are replaced with original components, and the completed instrument is checked to make sure it is operating as specified. This includes alignment where necessary.

This department is maintained only for those few cases where some difficulty might be encountered with a Heathkit after it has been built by the customer. Although you may never have occasion to use this service, it is reassuring to know it is available and that the Heath Company will stand behind each and every kit sold.



By Daystrom



Enlarger Timer KIT

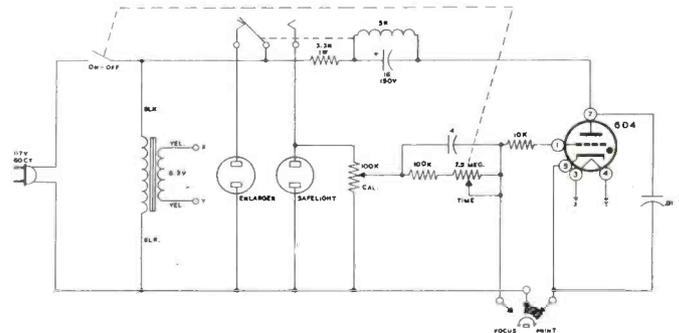
FEATURES

- Easy-to-read, linear dial scale—front-panel calibrate control.
- Compact plastic case resists photographic chemicals.
- Handles up to 350 watts at enlarger or safelight receptacles.
- Timer does not have to be reset after each cycle.
- All-electronic circuit for greater accuracy.

\$1150 MODEL ET-1

SPECIFICATIONS

Timing Range	0-1 minute, continuously variable.
Controls	Off-On/Timing Focus/Print Calibration.
Receptacles	Enlarger and Safelight 350 watts maximum each.
Tube	1—6D4.
Power Requirements	105-125 V 50-60 Cycle AC, 3 watts.
Cabinet Size	6¼" long x 3¾" wide x 2" deep Non-corrosive plastic.
Kit Net Weight	1½ lbs.
Kit Shipping Weight	3 lbs.
Construction Time	1 Evening.



The model ET-1 is an easy-to-build electronic device to be used by amateur or professional photographers in timing enlarger operations.

The calibrated dial on the timer covers 0 to 1 minute, in five-second graduations. The continuously variable control allows setting of the "on" cycle of your enlarger, which is plugged into a receptacle on the front panel of the ET-1. A "safe" light can also be plugged in so that it is automatically turned "on" when the enlarger is turned "off". An internal relay handles up to 350 watts at enlarger or safe light receptacles.

The all-electronic timing cycle assures maximum accuracy. To start the timing cycle the timer dial is first set to the desired number of seconds and the spring-return lever switched to "print". The timer does not have to be reset after each cycle, merely flip the

switch to print, to repeat the timing cycle. When the lever switch is moved in the opposite direction to the focus position the enlarger will remain "on" for focusing and masking. A control is provided for the initial calibration so that the timing cycle will correlate with the panel calibration. The ET-1 requires only 3 watts for operation so very little heat is generated. This results in long life of the components and no undue heating of small dark rooms. Once the timing cycle is started, the operator is free to do "dodging" or process already-exposed prints without fear of over-exposure. The timer is housed in a compact plastic case that will resist attack of photographic chemicals. Its small size enables it to be placed almost anywhere at the enlarging position. Top-quality components are used throughout to insure many years of troublefree performance. This timer can be built in just one evening. Shpg. Wt. 3 lbs.

HEATHKIT Battery Tester KIT

The model BT-1 is a special battery testing device that actually "loads" the battery (draws current from it) while it is being tested. Weak batteries often test "good" with an ordinary voltmeter, but the built-in load resistance of the BT-1 automatically draws enough current from the battery to reveal its true condition. Simple to operate, and no complicated meter readings to interpret.

To use the model BT-1 just set the voltage selector, connect the leads to the battery, and read the condition of the battery on the three-color "good-weak-replace" scale. Test batteries in a way your customers can understand and stimulate battery sales. Ideal for testing dry cell hearing aid, flashlight, portable radio, and model airplane batteries. Provides test ranges of 0-15 volts and 0-180 volts. A slide switch provides for either 10 ma or 100 ma load, depending on whether you're testing an A or B battery. Not only determines when battery is completely exhausted, but makes it possible to anticipate failure by noting weak condition. Shpg. Wt. 2 lbs.

MODEL BT-1

\$850





By Daystrom

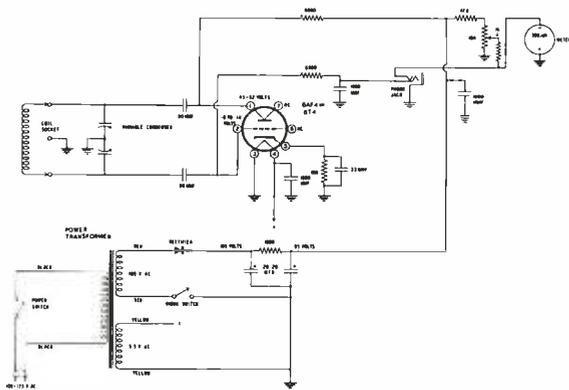
Grid Dip Meter KIT

FEATURES

- Prewound coil kit and rack.
- Continuous frequency coverage from 2 MC to 250 MC.
- Compact—Simplified one-hand operation.
- 500 microampere meter—variable sensitivity control.
- Jack for headphone monitoring—precalibrated dial scale.



MODEL GD-1B **\$19⁹⁵**



Radio amateurs and servicemen have proven the value of this grid dip meter many times over. Indispensable in the service shop, the laboratory, or the ham shack, for locating parasitics, spurious oscillations, neutralizing, determining RF circuit resonant frequencies, aligning IF stages, traps and filters, and correcting TVI. Can also be used to roughly determine capacitor and inductance values, and to provide a relative indication of power in transmitter stages. Originally the grid dip meter found its greatest application in the amateur radio field, but now it is used extensively in radio and TV servicing and in experimental laboratories.

With the oscillator not energized, the instrument acts as an absorption wave meter on high signal level circuits. Plugging headphones into the phonejack further extends the instrument's usefulness through operation as an oscillator-detector for determining the frequency of other oscillator circuits through zero beating.

Many factors were considered in the design of this outstanding instrument, resulting in a grid dip meter that is packed with de-

SPECIFICATIONS

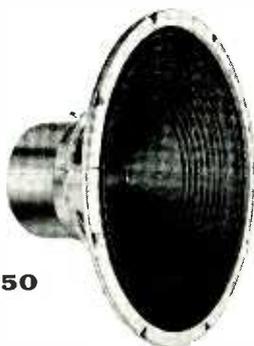
- Frequency Range**.....2—250 mc using 5 plug-in coils supplied with kit (350 kc—2000 kc with additional coil set.)
- Meter Movement**.....500 microampere.
- Circuit**.....6AF4 or 6T4 high frequency triode in a Colpitts oscillator circuit.
- Power Supply**.....Transformer operated with selenium rectifier.
- Physical Specifications**.....Length 7", Width 2½", Depth 3¼".
- Power Requirements**.....117 volts, 50/60 cycles at 5 watts.

sirable features. Notice that one hand operation is possible. The grid dipper may be held in one hand and tuned, leaving the other hand entirely free for making circuit adjustments. A variable sensitivity control assures adequate range of sensitivity throughout the entire frequency range. Plug-in coils can be quickly changed, and cover the frequency range from 2 mc to 250 mc continuously. Spare, blank dial scales are supplied for the builder who wishes to hand-calibrate this particular instrument, or desires maximum accuracy at specific frequencies.

The GD-1B incorporates its own power supply and is transformer operated from the power line. Shpg. Wt. 4 lbs.

ADDITIONAL PLUG-IN COILS . . .

A set of two additional plug-in coils is available for the GD-1B. This set is the 3-prong mounting type and provides continuous extension of low frequency coverage down to 350 kc. Dial correlation curves are included. Shpg. Wt. 1 lb. No. 341-A. Only \$3.00 complete.



\$7⁵⁰

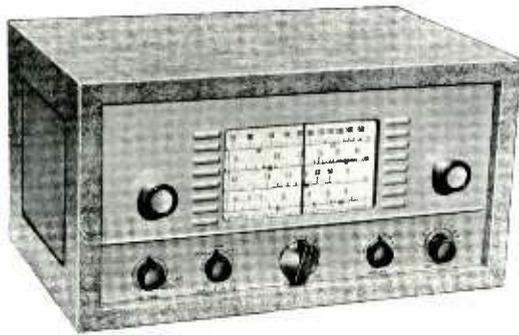
HEATHKIT

12" Utility Speaker

Hams, servicemen, and high fidelity enthusiasts will find many varied applications for this 12" utility speaker. Use it to replace a small speaker in a radio or TV set to obtain better tone quality, or as an auxiliary speaker for testing purposes. It can be used in a hi-fi or public address system to pipe sound into other rooms, etc. The speaker will handle up to 12 watts with a frequency response of ± 5 db from 50 to 9,000 CPS. Speaker impedance is 8 ohms and has an eight ounce magnet. Well worth the low Heathkit price. Shpg. Wt. 7 lbs. No. 401-6. \$7.50.



By Daystrom



MODEL AR-3

\$2995 (less cabinet)

COMMUNICATIONS-TYPE

All Band Receiver KIT

FEATURES

- Covers 550 KC to 30 MC in four bands.
- Slide-rule dial—electrical band-spread—ham bands marked.
- Slug-tuned coils and efficient IF transformers for good sensitivity and selectivity.
- Transformer operated power supply for safety and high efficiency.

SPECIFICATIONS

Frequency Range.....550 kc to 30 mc on four bands.
 Tube Complement.....1—12BE6 Oscillator and Mixer.
 1—12BA6 IF Amplifier.
 1—12AV6 Second Detector, AVC, First Audio Amplifier and Reflex BFO.
 1—12A6 Beam Power Output.
 1—5Y3 Full Wave Rectifier.
 Power Requirements.....105—125 volts AC 50/60 cycles 40 watts.
 Dimensions.....11½" wide x 5¾" high x 6¾" deep.
 Shipping Weight.....12 lbs.
 Amateur bands plainly marked on dial.

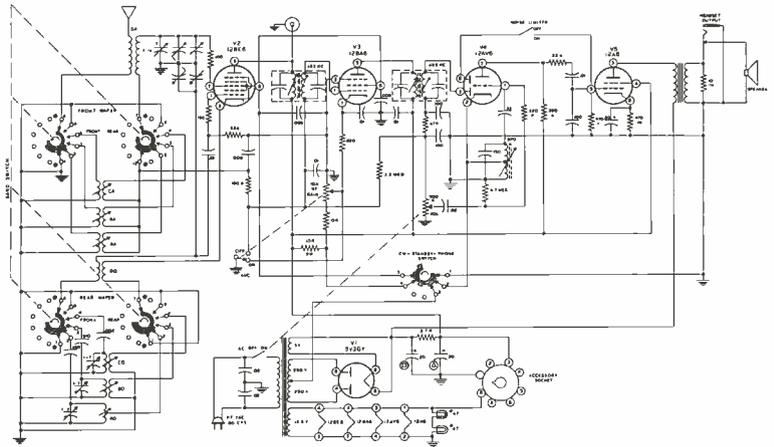
CONTROLS

General Coverage Tuning
 Band Spread Tuning
 Headphone Jack

Antenna Trimmer
 Band Switch
 Noise Limiter On/Off

Phone—Standby—CW Switch
 RF Gain Control/AVC On-Off
 AC On/Off—Audio Gain
 Accessory Socket

Sockets for connecting Heathkit Model QF-1 Q Multiplier on rear of chassis.



The Heathkit model AR-3 Receiver features proven circuit design and physical layout. The net result is good sensitivity and selectivity, coupled with more flexible overall operation. Performance of the AR-3 is really outstanding, especially in view of its low kit price.

High Q slug-tuned coils are used in the front end and an antenna trimmer has been added so that the front end may be peaked to a particular signal on any of the bands. The coil layout permits easy alignment from above the chassis. Predesigned oscillator coils result in increased conversion transconductance through the mixer circuit, and new-type IF transformers allow a better band pass curve, and more gain. The tuning capacitor is shock mounted, and the overall layout eliminates ground loops, shortens important lead lengths, and makes for easy assembly.

The physical layout of the AR-3 is designed for high circuit efficiency, and for convenience in construction. Frequency coverage is from 550 kc to 30 mc in four bands clearly marked on a slide-rule dial. The ham bands are also plainly marked. The circuit employs a 12BE6 oscillator and mixer, a 12BA6 IF amplifier, a 12AV6 second detector, AVC, first audio amplifier, and reflex BFO, a 12A6 beam power output tube, and a 5Y3 rectifier. The power supply is transformer operated for safety and high efficiency. A band switch eliminates coil changing, and provision is made for main tuning—band-spread tuning—phone-standby-CW switch—headphone jack—antenna trimmer—noise eliminator—RF gain control and AF control. Two dial lights are provided to illuminate the tuning dial softly.

Accessory sockets are provided on the rear of the chassis for using the Heathkit model QF-1 Q Multiplier. The accessory socket is handy also, for operating other devices that require plate and filament potentials. It will supply +205 volts DC at 15 ma and 12.6 volts AC at 300 ma. Slug-tuned coils allow close tracking adjustments. The BFO (beat-frequency oscillator) circuit is more stable and delivers greater audio output when receiving CW signals. The standby switch prevents voltage surges and resulting audio blasting during switching. Ceramic bypass capacitors have been used freely to reduce stray coupling in signal circuits. In all, the model AR-3 offers tremendous improvements over the previous model and is a fine receiver for the beginning amateur, short wave listener, or for anyone whose listening interest extends beyond the standard broadcast band. No special antenna is required. Any long wire end fed antenna can be used for maximum signal pickup. A signal generator is recommended for final alignment for best results. Shpg. Wt. 12 lbs.

CABINET:

The 91-15A cabinet for the AR-3 is both attractive and practical. It provides protection of all components of the completed receiver as well as improving its appearance. The tone quality of the speaker is also improved by the cabinet. This pyroxylin impregnated fabric covered cabinet includes the aluminum front panel, reinforced speaker grille, and protective rubber feet. Front panel is screened, indicating function of the various controls. Measures 12¼" W. x 6¾" H. x 7¼" D. No. 91-15A. Shpg. Wt. 5 lbs.

\$4.95



By Daystrom

"AUTOMATIC"

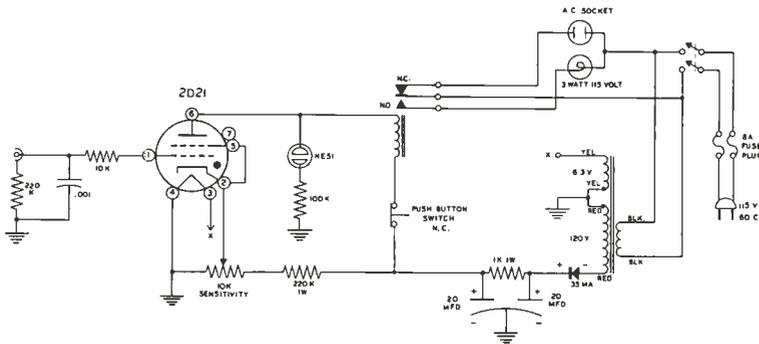
Conelrad Alarm KIT



FEATURES

- Use with any receiver for conelrad alarm.
- Automatically turns off transmitter and gives visual signal.
- Heavy-duty, 6-ampere relay.
- Sensitivity control to adjust to various AVC levels.

MODEL CA-1 **\$13⁹⁵**

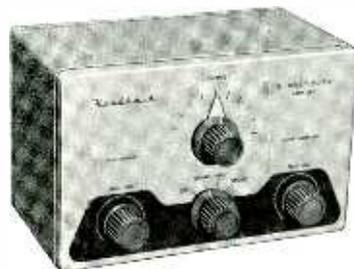


SPECIFICATIONS:

- Tube Complement.....2D21 thyratron.
- AVC Sensitivity.....-2 volts to -20 volts.
- Operating Power.....115 volts AC, 60 cycles 7 watts.
- Power Capability.....115 volts AC, 60 cycles 700 watts.
- Cabinet Size.....7³/₈" wide x 4¹/₁₆" high x 4¹/₈" deep.
- Net Weight.....3 lbs.
- Shipping Weight.....4 lbs.

The model CA-1 Conelrad Alarm Kit is a simple, easy to build device that will allow you to fully comply with FCC regulations without a large dollar investment. Use it with any radio receiver (AC-DC, transformer operated, or battery powered) as long as the receiver has AVC. When the monitored broadcast station goes off the air, the Heathkit model CA-1 automatically removes AC power from your transmitter, and lights a red indicator on the front panel. A manual "reset" button reactivates the transmitter again. An external alarm device such as a bell, gong, etc. can be used in place of the transmitter if desired. The CA-1 features its own heavy-duty six-ampere relay, a thyratron tube to activate the relay, and its own

built-in power supply with transformer isolation. A neon lamp on the front panel of the conelrad alarm verifies the fact that it is in operation, by indicating the presence of B+ in the alarm circuit. Very simple to install. Your transmitter plugs into the AC receptacle on the CA-1, and a cable connects from the conelrad alarm to the receiver AVC circuit. A sensitivity control adjusts to various AVC levels. Receiver volume control can be turned up or down without affecting alarm operation. Build the Heathkit "automatic" Conelrad Alarm Kit in one evening and comply with FCC regulations now! A list of all Conelrad key stations is given in the construction manual. Shpg. Wt. 4 lbs.



MODEL QF-1

\$9⁹⁵

HEATHKIT

"Q" Multiplier KIT

The Heathkit Q Multiplier is the kind of device that must be used to be appreciated. It provides additional selectivity or signal rejection as desired when used with a communications receiver. A tremendous help on crowded phone and CW bands. The peak or null effect of the Q Multiplier may be tuned across the receiver's IF bandpass so its operation is more flexible than that of a crystal filter. The QF-1 may be used with a receiver which already has a crystal filter to obtain two simultaneous functions. The receiver's crystal filter could be set to peak the desired signal and the QF-1 to null an adjacent signal. Can be used with any AM receiver having an IF frequency between 450 and 460 kc, that is not AC-DC type. It obtains its power from the receiver with which it is used, and requires only 6.3 volts AC at 300 ma (or 12 volts AC at 150 ma) and 150 to 250 volts DC at 2 ma. It is simple to connect with cable and plugs supplied following instructions in the manual. It provides an effective Q of approximately 4,000 for extremely sharp "peak" or "null." Tunes by means of a convenient tuning knob on the front panel. This Q Multiplier is "top quality" all the way through. Cabinet measures 7³/₈" W x 4¹/₁₆" H x 4¹/₈" D. Shpg. Wt. 3 lbs.



By Daystrom

PHONE & CW

DX-100 Transmitter KIT

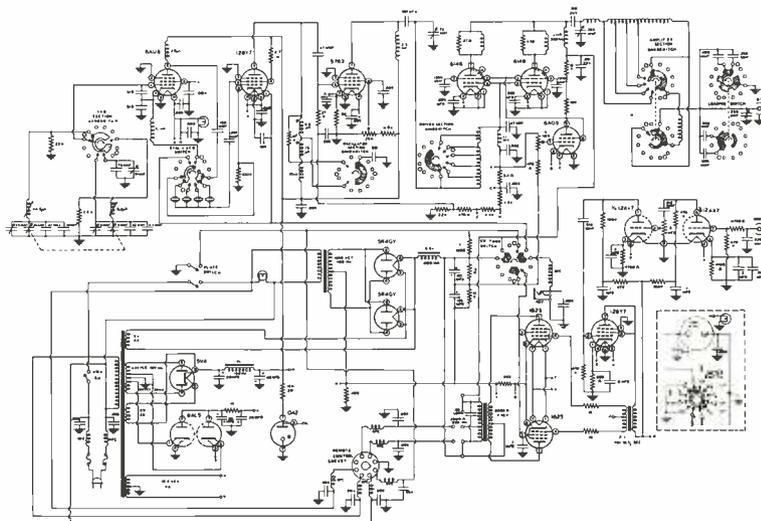
FEATURES

- Phone or CW on 160, 80, 40, 20, 15, 11 and 10 meters.
- Built in VFO, modulator, and power supplies. 5-point TVI suppression.
- Kit includes all parts—tubes—hardware—cabinet, etc.—Easy-to-build.
- Coils are pre-wound and cable is pre-harnessed.
- High quality components are used throughout for reliable performance.

\$189⁵⁰ MODEL
DX-100

SPECIFICATIONS

RF Power Output.....	100-125 watts phone, 120-140 watts CW.
Output Impedance.....	50-600 Ω (non-reactive).
Output Coupling.....	Pi network (coaxial).
Operation.....	Crystal-VFO, CW-Phone, Local-Remote.
Band Coverage.....	160, 80, 40, 20, 15, 11, 10.
Audio Output.....	85 watts at 300-3000 cycles.
Tube Complement:	
Power Section.....	6AL5 bias rectifier. 5V4 low voltage rectifier. 2—5R4GY high voltage rectifier. OA2 regulator.
Audio Section.....	12AX7 speech amplifier. 12BY7 audio driver. 2—1625 modulator.
RF Section.....	6AU6 VFO. 12BY7 crystal oscillator-buffer. 5763 driver. 2—6146 parallel power amplifier. 6AQ5 clamp.
Power Requirements.....	115 volts AC, 50 to 60 cycles.
Standby.....	150 watts.
CW.....	400 watts (intermittent).
Phone.....	450-600 watts.
Cabinet Size.....	20 1/8" wide x 13 3/4" high x 16" deep.
Net Weight.....	100 lbs.
Shipping Weight.....	107 lbs.



This transmitter is a completely proven piece of ham gear. Amateur radio operators in the field are enthusiastic in praising its performance under actual operating conditions. It provides the latest and most desirable design features, and combines high quality with real economy.

The model DX-100 is a completely bandswitching rig for phone or CW operation on 160, 80, 40, 20, 15, 11 and 10 meters. It has a built-in VFO, or may be excited from crystals. Crystal sockets are built in. The easy-to-build kit contains all parts necessary for construction, including tubes, cabinet, hardware, etc. The detailed step-by-step instruction manual features plenty of pictorial diagrams for easy assembly. Pi network output coupling allows matching non-inductive loads from 50 to 600 ohms, and is only one of the design features of this outstanding performer.

This transmitter employs push-pull 1625 tubes modulating parallel 6146 tubes. RF output is in excess of 100 watts on phone, and 120 watts on CW.

The VFO circuit consists of a 6AU6 tube operating as a clapp oscillator in the frequency ranges of 1750 to 2000 kc, 7000 to 7425 kc and 6740 to 6807.5 kc. An OA2 regulator tube stabilizes the B supply to the oscillator screen grid.

A 12BY7 tube is used either as a modified Pierce crystal oscillator, or as a buffer, depending on whether the function switch is on crystal or VFO. The plate circuit of this stage is untuned when operating 160 or 80 meters, slug-tuned to 40 meters for operation at 40, 20, or 15 meters, and slug-tuned to 20 meters when operating on the 10-11

meter band.

A 5763 tube drives the parallel 6146 final. Pi network interstage coupling is employed between this stage and the final grid.

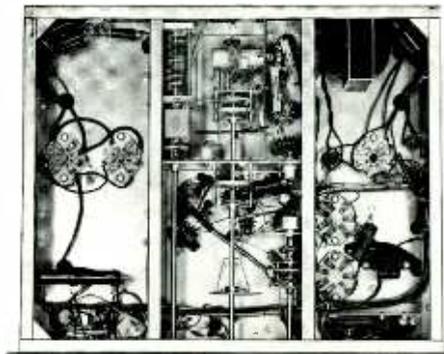
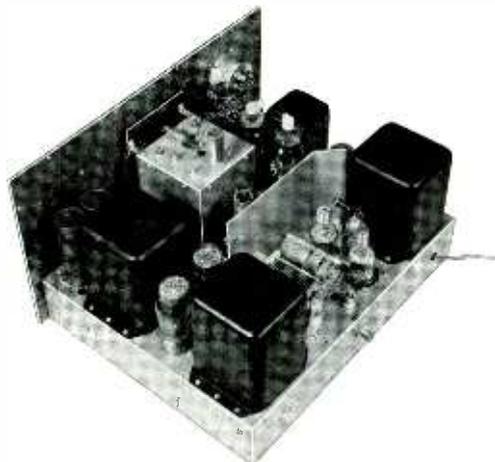
The 6AQ5 clamp tube serves to protect the 6146 tubes by reducing screen voltage automatically if grid drive to the final tubes is removed.

A single 12AX7 tube provides two stages of resistance—coupled triode speech amplification in the audio section. A 12BY7 driver provides input voltage to the 1625 modulator tubes. The speech amplifier and the modulator stages have been designed to restrict the audio speech range. This provides a "hard hitting" audio modulation with plenty of punch.

Separate power supplies are used for low-level and high-level functions. The low voltage transformer contains all the filament windings, including the filament for the high voltage rectifiers. It has a tapped secondary to supply voltage for the bias rectifier. A 12-volt center tapped winding supplies audio and RF stage filaments. The low voltage supply delivers 360 volts at 150 ma to the low power audio and RF stages. The bias rectifier voltage is 75 volts. The high voltage supply provides plate and screen potential for the final RF and modulator stages. The entire power section of the transmitter is fused (both sides of the line) at the line plug. All power supply components, including transformers and chokes are well rated for their service.

The DX-100 has been "amateur designed" to incorporate all of the most desirable features for convenient and effective amateur communications.

High quality parts are used throughout construction for reliability and service. Notice the aluminum heat-dissipating plate caps, extensive shielding, copper plated chassis, heavy duty "potted" transformers, etc. All these features insure top performance on the air.



LAYOUT: The view above shows the under-chassis layout of the DX-100. Notice that the parts are not crowded together and that plenty of "elbow room" is provided. The transmitter is easy-to-build, even for the beginner. "Unitized" constructional procedure allows work on chassis plate or other sub-chassis before they are attached to main chassis frame.

The DX-100 transmitter is easy to build and attractively styled. Assembly is sub-divided into several stages. This allows the construction to proceed smoothly from one section of the transmitter to another. Sub-units are assembled and then added to the complete chassis. The chassis is extra-strong 16-gauge copper-plated steel. Construction is further simplified by the use of a pre-formed wiring harness, pre-formed coils, etc.

The VFO dial is illuminated for easy reading under subdued lighting conditions, and the meter is illuminated as well.

A remote control socket is provided on the back chassis apron. This will provide AC voltage for operating an antenna change-over switch or a receiver muting relay. Also the circuit can be arranged to bring audio voltage out to this connector socket for driving an external modulator, in case the transmitter were used as a driver for a higher powered rig.

In addition to all the extra features incorporated in this transmitter, features definitely not expected at this price level, the rig is also most attractive. Modern cabinet design in two-tone gray and interesting panel treatment with modern knobs lend a real "professional" look to the transmitter. It's the kind of transmitter you will be proud to display in your ham shack. Needless to say, its performance is very much in keeping with its modern appearance.

Inspection of the "inside" photographs above will give an in-

dication of the high quality parts used in the DX-100. Notice that all the transformers are of the "potted" type and that other components are top-notch items selected for their reliability and service. Capacitors are either disk-ceramic or plastic-molded types, except for the electrolytic units used in power supplies. The aluminum heat-dissipating plate caps used on the 6146 tubes are typical of the "extras" that can be expected in this transmitter. Porcelain and ceramic insulation is used wherever necessary, and silver-plated, and even solid coin silver switch terminals are used in critical circuits. The entire chassis and sub-chassis units are copper plated for better conduction and more effective shielding. Another feature of the transmitter is its five-point TVI suppression. Pi network inter stage coupling is employed to reduce harmonic transfer from one stage to another. Pi network output coupling reduces harmonic radiation to the antenna. Extensive shielding isolates RF stages and prevents undesirable intercoupling. All incoming and outgoing circuits are filtered to keep RF inside the cabinet. Interlocking cabinet seams prevent RF leakage. Even the meter is provided with a panel shield to prevent RF radiation through the meter hole in the panel.

Just check over the schematic, and the specifications for this transmitter, and you'll see what a really outstanding value it represents. Shpg. Wt. 107 lbs.

HEATHKIT

Balun Coil KIT

The Heathkit Balun Coil Kit model B-1 is a convenient transmitter accessory, which has the capability of matching unbalanced coaxial lines, used on most modern transmitters to balance lines of either 75 or 300 ohms impedance. The design of the bifilar wound coils will enable transmitters with unbalanced output to operate into balanced transmission lines such as used with dipoles, folded dipoles, or any balanced antenna system.

The balun coil set can be used with transmitters and receivers without adjustment, over the frequency range of 80 through 10 meters, and will handle power inputs up to 200 watts.

The balun coil cabinet dimensions are 9" square by 5" deep and it may be located any distance from the transmitter or from the antenna. Can be mounted inside or outside of the "ham shack". A protective cover is supplied with the balun coil set to prevent damage to components by weather or other causes in outdoor installations. Very easy to build, the B-1 can be put together in less than an hour, and it will help you get a more efficient match between your transmitter and antenna. Shpg. Wt. 4 lbs.



MODEL B-1 \$8.95



\$64⁹⁵ MODEL
DX-40



By Daystrom

DX-40 PHONE AND CW

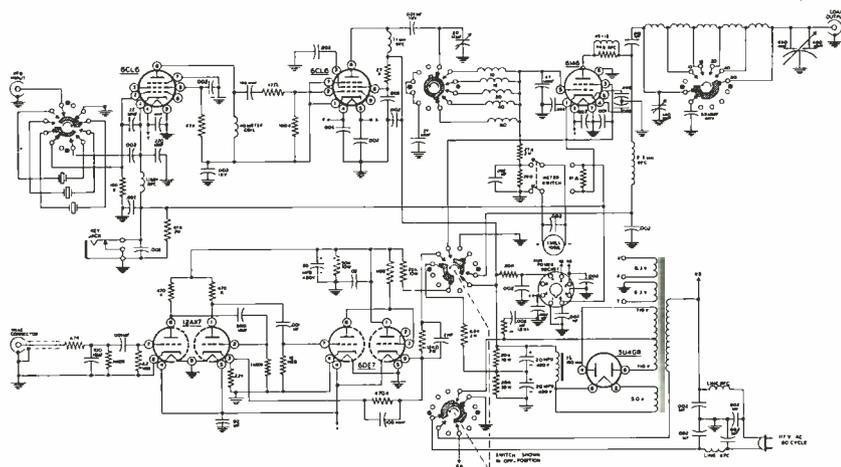
Transmitter KIT

FEATURES

- 6146 final amplifier for full 75-watt plate power input.
- Phone and CW operation on 80, 40, 20, 15, 11 and 10 meters. Pi network output coupling.
- Switch selection of three crystals—provision for external VFO excitation.
- D'Arsonval movement panel meter indicates final grid or plate current.

SPECIFICATIONS

Power Input	75 watt CW, 60 watt peak controlled carrier phone.
Output Impedance	50-1000 Ω .
Output Coupling	Pi network (coaxial).
Operation	Crystal-VFO, CW, Phone.
Band Coverage	80, 40, 20, 15, 11, 10 meters.
Tube Complement	5U4GB Rectifier. 12AX7 Speech Amplifier. 6DE7 Controlled Carrier, Modulator. 6CL6 Crystal Oscillator. 6CL6 Buffer. 6146 Final Amplifier.
Power Requirements	117 volts AC, 60 cycles, 175 watts.
Cabinet Size	13" wide x 8½" high x 9" deep.
Net Weight	21 lbs.
Shipping Weight	26 lbs.



The DX-40 is an entirely new transmitter, featuring increased power, clean keying characteristics and stability made possible by the efficient circuit design. An ideal rig for the novice who intends to operate on phone as soon as he gets his general-class ticket, yet needs a CW rig in the meantime. Experienced hams also will find the DX-40 appealing since it provides the phone and CW facilities desired in a low-power rig.

The plate power input of the model DX-40 is 75 watts on CW, and peaks to 60 watts with controlled-carrier phone modulation. It covers 80, 40, 20, 15, 11 and 10 meters with single-knob bandswitching. Pi network output coupling is employed for easy antenna loading. Pi network coupling is also featured between the buffer circuit and the final amplifier thus improving stability and attenuating the higher order harmonics, reducing the possibility of television interference. A line filter is incorporated to prevent RF radiation through the power line. The efficient oscillator and buffer circuit provides adequate drive to the 6146 amplifier from 80 to 10 meters even with an 80 meter crystal. A drive control adjustment provides excellent maximum to minimum drive requirements. A five-position function switch provides an extra "tune" position, allowing you to switch on the oscillator without the final amplifier being on, so the operator can locate his own signal on the band. Tuning the buffer stage to proper drive level before the final is on also prevents the possibility of damage to the final amplifier tube.

The tube lineup features a 6CL6 Colpitts oscillator, 6CL6 buffer, 6146 amplifier, 12AX7 dual-triode speech amplifier, 6DE7 dual-triode modulator, and a heavy-duty 5U4GB rectifier. The modulator circuitry features an audio frequency shaping network allowing a higher average output level on voice frequencies where it is required. Provision is made for three crystals. A four-position switch

selects any of the three crystals or a jack for external VFO. The crystal sockets are easily accessible through a "trap door" in the back of the cabinet. An external VFO (variable frequency oscillator) can also be used to excite the transmitter for the general or advanced-class ham. Power for the VFO is available at a socket on the rear apron of the chassis.

Top-quality components are used throughout. The transformers are potted types, ceramic switches are used in the final RF circuits, all coils are pre-wound, etc. The circuit features liberal shielding and careful physical placement of components and leads for stable operation. The circuit design has been extensively tested "on the air" with excellent reports, assuring you of the best possible performance. Besides being carefully designed both electrically and physically, the styling of the DX-40 is outstanding. Two large knobs on the front panel provide smooth antenna and final tuning. Between them is a switch for the easy-to-read front-panel meter with a D'Arsonval movement that indicates final grid or plate current. The function switch is at the lower left, providing selection of off, tune, standby, phone and CW. The drive control is in the center. The key jack is at the extreme left, and a pilot light is at the extreme right. Its attractive and professional appearance is in keeping with the fine operation it can provide for you in your ham shack. You can build this rig yourself and be proud to show it off to your fellow hams. Assembly instructions are complete in every respect. The manual contains complete step-by-step instructions that are tied-in closely with large pictorial diagrams, to prevent costly mistakes. Assembly proceeds smoothly from start to finish even for an individual who has never built electronic equipment before. Whether you are a newcomer or an old-timer, you will find the DX-40 a very worthwhile addition to your ham shack. Shpg. Wt. 26 lbs.



By Daystrom

DX-20 CW

Transmitter KIT

FEATURES

- 50 watts plate power input to 6DQ6A final.
- Straight-CW operation—maximum efficiency and clean output signal.
- Crystal controlled—or may be excited from external VFO.
- Covers 80—40—20—15—11—10 meters.
- Single-knob band switching—no coils to change.

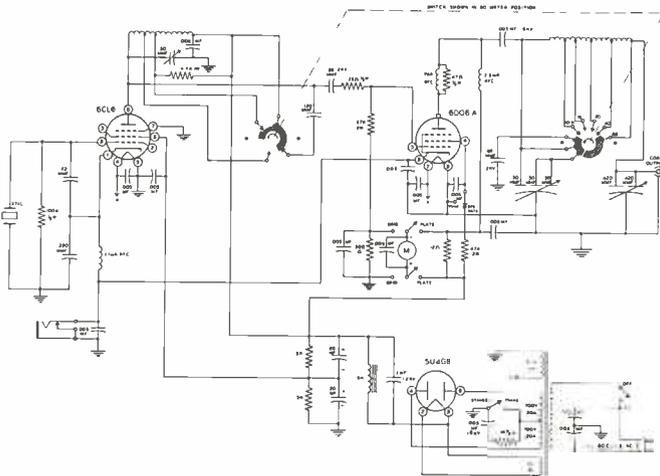


MODEL
DX-20

\$3595

SPECIFICATIONS

RF Power Input.....	50 watts CW.
Output Impedance.....	50-1000 ohms.
Output Coupling.....	Pi network (coaxial).
Operation.....	Crystal—external VFO.
Band Coverage.....	80-40-20-15-11-10.
Tube Complement.....	5U4GB rectifier. 6CL6 oscillator. 6DQ6A final amplifier.
Power Requirements.....	115 volts AC, 60 cycles, 150 watts
Cabinet Size.....	13" wide x 8½" high x 7" deep.
Net Weight.....	16 lbs.
Shipping Weight.....	18 lbs.



Here in the model DX-20 is a transmitter that has been designed without compromise, exclusively for CW work. It features an entirely new circuit over the preceding model, and is one of the most efficient little transmitters available today. It's the ideal rig for the novice or for the advanced-class CW operator. Just the ticket for any radio amateur interested in CW work who appreciates a good clean signal, and wants the most "watts-per-dollar" in his ham shack.

The plate power input of the model DX-20 is 50 watts, and the rig covers 80, 40, 20, 15, 11 and 10 meters. It is designed for crystal excitation but an external VFO may be used. A pi network output circuit is featured for matching antenna impedances between 50 and 1000 ohms. It employs a 6DQ6A final amplifier, a 6CL6 oscillator, and a 5U4GB rectifier. A great deal of thought went into the design of this rig. It features short leads, horizontal tube mounting, a very efficient band change switch arrangement, and many other evidences of careful design. The transmitter incorporates single knob band switching, uses potted transformers, and high quality components throughout. Truly, the CW man's transmitter. Top performance for minimum investment.

Measuring only 13" W. x 8½" H. x 7" D., the DX-20 is enclosed in a tight steel cabinet to minimize TVI. The front panel was designed with full consideration for convenience of operation. The two large knobs at each side of the panel are for tuning the oscillator and the final amplifier. The band change switch is in the center of the panel, just below the meter switch. The easy-to-read meter indicates final grid current or final plate current. Across the bottom of the panel, from left to right, are the main "on-off" switch, the "on-standby" switch, the variable "loading control", to match various antenna

impedances, the "tune-operate" switch, and the key jack. The "tune-operate" switch provides a means of switching on the oscillator without the final amplifier being on; so the operator can locate his own signal on the band without going on the air, and tune the oscillator stage before the final is on. The crystal socket is located inside of the cabinet, and a "snap-out" plug is provided on the left panel of the case for convenient access while still maintaining "tight" construction. This minimizes radiation outside of the case, lessening the possibility of television interference. The antenna output is on the back chassis apron. In addition to being an attractively styled transmitter, and featuring an "optimized" circuit, the DX-20 is very easy to build. This probably would not be of great concern to the "old-timer", but it is important to the novice or beginning ham. The construction manual contains complete step-by-step directions for assembly. Large pictorial diagrams are referenced all the way through, and it is not necessary to read a schematic diagram. We are sure you will agree that this CW transmitter cannot be matched for over-all quality and efficiency on the market today. Shpg. Wt. 18 lbs.

TIME PAYMENTS

The Heath Time Payment Plan was designed for your convenience. Now you can order the kits of your choice, and pay for them over a 12-month period. Use this plan for any purchase amounting to \$90 or more, whether it consists of a single kit or a group of kit items. See order blank for details.



\$19⁵⁰ MODEL VF-1



By Daystrom

VARIABLE FREQUENCY OSCILLATOR

VFO KIT

FEATURES

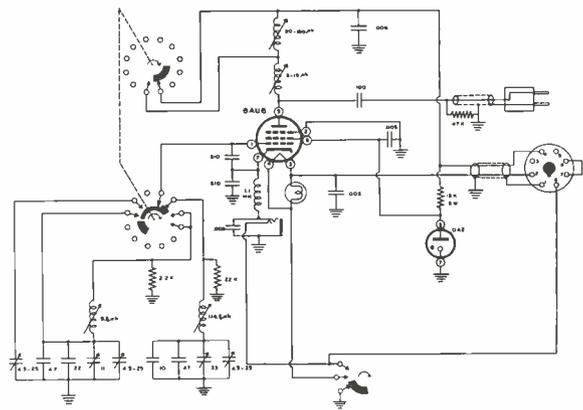
- Covers 160—80—40—20—15—11—10 meters.
- Smooth-acting, illuminated and precalibrated dial.
- OA2 voltage regulator tube for stability.
- 6AU6 electron-coupled Clapp oscillator.
- Copper plated chassis—aluminum case—extensive shielding—ceramic coil forms, switch wafers, and tuning condenser insulation.

SPECIFICATIONS

- Output Frequencies.....1750-2000 kc, 7000-7425 kc, 6740-6808 kc.
- Calibrated Bands.....160-80-40-20-15-11-10 meters.
- RF Output.....Approximately 10 v. on fundamentals.
- Output Termination.....50 ohm coax. to plug for 1/2" crystal socket.
- Tube Complement.....6AU6 Oscillator, OA2 Voltage Regulator.
- Power Requirements.....250-350 VDC @ 15-20 ma. and 6.3 VAC @ .45 A.
- Dimensions.....7" high x 6 1/2" wide x 7" deep.
- Net Weight.....4 lbs.
- Shipping Weight.....7 lbs.

Enjoy the convenience and flexibility of VFO operation by obtaining the Heathkit model VF-1 Variable Frequency Oscillator. It features voltage regulation for frequency stability and covers 160—80—40—20—15—11 and 10 meters with three basic oscillator frequencies. Better than 10 volt average RF output on fundamentals. Plenty of output to drive most modern transmitters. More than 2 feet of dial calibration available, and the dial is illuminated for maximum readability. Vernier reduction is used between the main tuning knob and the tuning condenser for smooth dial action. Requires a power source of only 250 volts DC at 15 to 20 milliamperes and 6.3 volts AC at 0.45 amperes available on most transmitters.

Extra features include copper-plated chassis, ceramic coil forms, extensive shielding, etc. High-quality parts are used throughout. It's easy to build, too, because of the complete construction manual



supplied. Calibration instructions are also provided in the manual. All adjustments are easy to reach through appropriate holes provided in the cabinet.

VFO operation allows you to move out from under interference and select a portion of the band you want to use without having to be tied down to only two or three frequencies through the use of crystals. "Zero in" on the other fellow's signal and return his CQ on his own frequency! Crystals are not cheap, and it takes quite a number of them to give anything even approaching comprehensive coverage of all bands. The cost of the Heath VF-1 is far below that of crystals, so if you want complete coverage of the amateur bands from 160 meters through 10 meters, why hesitate? The model VF-1 with its low price and high quality will add more operating enjoyment to your ham activities. Shpg. Wt. 7 lbs.



HAMS WITH YOUR INTERESTS IN MIND...

All of these licensed radio amateurs work at the Heath Company, and each of them makes his own important contribution to the Heath line of fine ham kits. In a sense, they are your representatives within the company, since their design ideas and performance preferences reflect not only their own "on-the-air" experiences, but those of the amateur fraternity with which they are in constant contact.

Perhaps you have already met some of them on the bands. In the back row, from left to right, are Al (K8BLL), Dar (K8ADS), Rog senior Ham Engineer (W8MWZ), Doug (K8GNA), Chuck (K8CJI), Al (W8HTX), Ciel (K8DKY), and Dick (K9BMJ/8). In the front row are Fred (K8GMY), Wayne (W8YRW), Frank (W8WUN), Rex (K8GND), and Gil (W8QAH/K9BRK). Ernie (W8VFN), Carl (W8UVK), and Don (W8LTB) are not pictured.

With this group representing you in Benton Harbor you can rely, as always, on high-performance equipment designed by hams for hams!



By Daystrom

REFLECTED

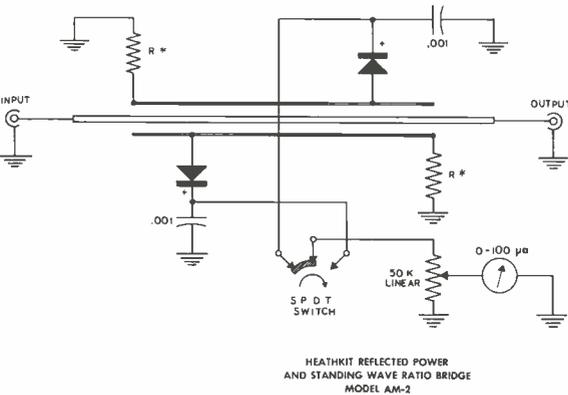
Power Meter KIT

FEATURES

- Completely self-contained—requires no external power for operation.
- Forward or reflected power and SWR (Standing wave ratio) measured directly on calibrated meter.
- Designed for operation on 50 or 75 ohm lines.
- Handles well over 1 kilowatt of power—introduces no insertion loss.
- Easy-to-assemble and use.



MODEL **\$15⁹⁵**
AM-2



* NOTE
R = 100Ω or 150Ω
Two 100Ω resistors and two 150Ω resistors are included in the kit.
The 100Ω resistors are used for 75Ω input and output.
The 150Ω resistors are used for 50Ω input and output.

SPECIFICATIONS

- R. F. Power Handling Capabilities**.....One full kilowatt.
- Input and Output Impedance**.....50 and 75 ohms.
- Power Requirements**.....None externally.
- Band Coverage**.....160 through 2 meters.
- Meter**.....100 microamperes, full scale.
- Operation**.....Indicates percentage, forward and reflected power, and standing wave ratio from 1:1 to 6:1.
- Cabinet Size**.....7³/₈" x 4¹/₈" x 4⁵/₈".
- Net Weight**.....1¹/₂ pounds.
- Shipping Weight**.....3 pounds.

With the Heathkit Reflected Power Meter, model AM-2, you no longer have to worry about the efficiency of your antenna system. The AM-2 is ideal for checking the match of the antenna transmission system, by measuring the forward and reflected power or standing wave ratio. It is designed to handle a peak power of well over 1 kilowatt of energy and may be left in the antenna system feedline at all times. Band coverage is 160 meters through 2 meters. Input and output impedances provided for 50 or 75 ohm lines. No external power is required for operation. Meter indicates percentage forward or reflected power, and standing wave ratio from 1:1 to 6:1. A control is provided in the meter circuit to adjust the reading from off-scale to full scale reading without the necessity of reducing the transmitter output to acquire the proper "on-scale" level.

Another application for the AM-2 is matching impedances between exciters or RF sources and grounded grid amplifiers. Power losses between transmitter output and antenna tuner may be very easily computed by inserting the AM-2 in the line connecting the two. No insertion loss is introduced into the feeder system, due to the fact that the AM-2 is a portion of coaxial line in series with the feeder system and no internal connections are actually made to the line. Input and output coaxial connections are provided at the rear of the AM-2 cabinet. A complete circuit description and operation instructions are provided in the manual. Cabinet size is 7³/₈" x 4¹/₈" x 4⁵/₈". This unit can be conveniently located at operating position and will provide an accurate reading of the function of the antenna configuration at all times. Shpg. Wt. 3 lbs.



MODEL **\$14⁵⁰**
AM-1

HEATHKIT

Antenna Impedance Meter KIT

Use the Heathkit model AM-1 Antenna Impedance Meter for measuring antenna impedance, for line matching purposes, and adjustment of beam and mobile antennas. Match the complete antenna receiver-transmitter system for optimum overall operation. Used in conjunction with a signal source, such as the Heathkit model GD-1B Grid Dip Meter, the AM-1 will determine antenna resistance and resonance, match transmission lines for minimum SWR (standing wave ratio), determine receiver input impedance and provide a close

approximation of SWR. Will also double as a phone monitor, or will function satisfactorily as a relative field strength meter.

Uses precision resistor, germanium diode and 100 microampere meter. The dial covers the range from 0-600 ohms so as to include the popular 600 ohm transmission line. Operates up to 150 megacycles.

Housed in a shielded aluminum cabinet which is 7" L. x 2¹/₂" W. x 3¹/₄" D. A valuable instrument around the ham shack. Shpg. Wt. 2 lbs.



\$23⁹⁵ MODEL VX-1



By Daystrom

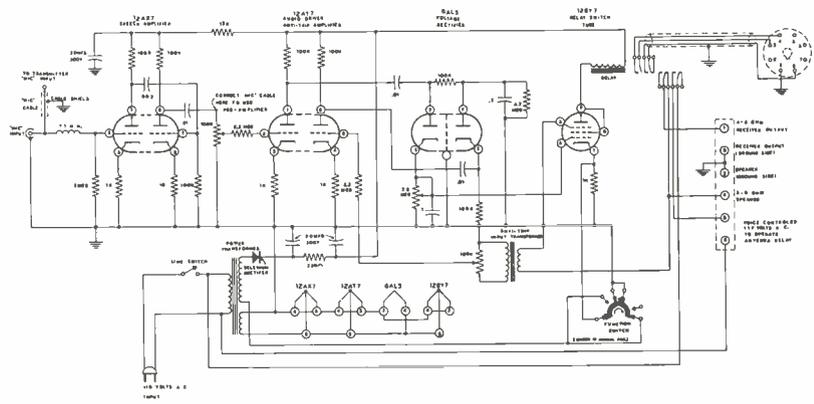
ELECTRONIC Voice Control KIT

FEATURES

- Voice-operated receiver and transmitter switching.
- Variable time control relay.
- Adaptable for remote control operation.
- Requires no transmitter or receiver alterations to operate.
- Voice controlled antenna relay voltage available.
- Completely self-contained—including power supply and cables.

SPECIFICATIONS

- Switched Circuits
No Voltage Output.....1-13 amperes.
1-5 amperes.
- Switched Circuit
With Voltage Output.....1-117 volts AC at 5 amperes.
- Tube Complement.....1-12AX7 speech amplifier.
1-12AT7 audio driver and anti-trip amplifier.
1-6AL5 bias voltage rectifier.
1-12BY7 relay switch tube.
- Power Requirements.....117 volts AC, 50-60 cycles.
- Cabinet Size.....7 3/8" W. x 4 5/8" H. x 4" D.
- Shipping Weight.....5 lbs.



Attention all ham operators! Here is a new and exciting kit that will add greatly to your enjoyment in the ham shack. The model VX-1 Electronic Voice Control allows you to switch from receiver to transmitter merely by talking into your microphone. Instead of making long transmissions and risking possibility of losing the other fellow —this unique device lets you operate "break-in" even with an ordinary AM transmitter. You get the advantage of "telephone-type conversation" as in SSB but with regular AM transmission. The VX-1 represents a new concept in AM radio transmission.

The VX-1 combines an electronic voice operated relay with a receiver "muting" stage. This circuitry performs several operations. During listening periods, the receiver audio must be isolated from the microphone. This is accomplished by the anti-trip amplifier which causes an out-of-phase condition between the receiver audio and the operator's voice, allowing operation only when the operator speaks. When the operator talks into the microphone, the receiver is automatically muted by opening the voice coil of the speaker. At the same time, it will actuate your antenna relay switch on the transmitter. The unit is adjustable to all conditions by sensitivity and gain controls provided. In addition, a variable time delay control is incorporated to modify the "hold" time to suit the requirements of the individual operator.

The power supply, which furnishes the heater and high voltages, is built in for simplicity of operation. No external power is required. The controls consist of: time delay, VOX-standby-manual switch,

off-on switch, receiver and transmitter sensitivity controls. The microphone input connector is also located on the front panel. A terminal strip is provided on the rear chassis apron for receiver and speaker connections and also for a 117 volt antenna relay. This unit is very easy to build with complete instructions provided for assembly and operation. Connection between the various units is also covered in detail with all necessary cable supplied.

The small size and attractive appearance of this fine unit will blend with your other equipment and will greatly simplify operation.

Although designed primarily for operation with the DX-100 Transmitter, the VX-1 can also be used in many other applications. Due to the preamplifier, which is built-in, and the associated circuitry, it may very easily be combined with a single sideband exciter, intercom system, recorder or dictaphone, etc. A current-carrying capacity of 15 amperes is available across pins 3 and 4 of the octal plug, and a current capacity of 5 amperes is provided across pins 8 and 1. A potential of 117 volts AC at 5 amperes is also available.

The VX-1 may also be used as an auxiliary speech amplifier for feeding audio to an existing modulator or modulator driver stage. A length of microphone cable is furnished with the VX-1, to couple its output to the transmitter "mike" input connector. By making the connections as described in the manual a two-stage audio amplifier results.

Modernize your ham shack now and enjoy the convenience of automatic operation. Shpg. Wt. 5 lbs.



By Daystrom

TRANSISTOR RADIO

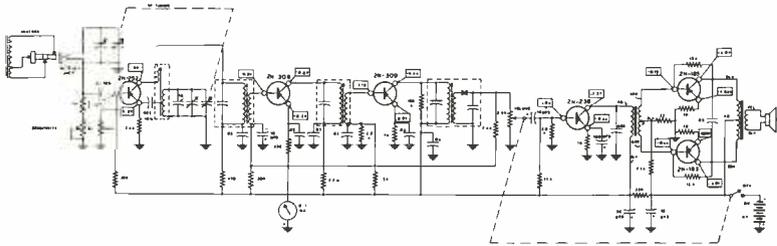
Direction Finder KIT

FEATURES

- Light, compact and self-powered.
- Use it for radio-compass or as a portable radio.
- 6 name-brand (Texas instrument) transistors.
- Directional ferrite loop antenna—built-in speaker.
- Prealigned IF transformers—vernier dial tuning.



MODEL DF-1 **\$54⁹⁵**



SPECIFICATIONS

- Frequency Range..... Broadcast Band (540 to 1620 Kilocycles).
 Sensitivity, at 50 mw. output reference level:
 Antenna.....120uv/meter.
 Converter Base.....0.44uv/meter.
 Power.....9 volt battery (spare included with kit).
 Current Drain......9 ma. with no signal.
 20 ma. with 50 mw output.
 Direction Indicator..... Adjustable compass rose, calibrated in degrees.
 Null and Tuning Indicator.....0-1 ma meter.
 Antenna..... High "Q" ferrite, rotated from panel.
 Transistor Complement..... 2N252—RF amp, local OSC., & converter.
 2N308—First IF amp.
 2N309—Second IF amp.
 2N238—First AF amp.
 2N185 (pair)—push—pull AF output.
 Dimensions Overall.....7½" W. x 5⅝" H. x 5⅝" D.
 Net Weight.....3½ lbs.
 Shipping Weight.....5 lbs.

The Heathkit Transistor Radio Direction Finder model DF-1 is a self-contained, self-powered, super heterodyne broadcast radio receiver incorporating six name brand (Texas Instrument) transistors, a directional loop antenna, indicating meter, and integral speaker. It is designed primarily as an aid to navigation when out of sight of familiar landmarks. The DF-1 can be used not only aboard yachts, fishing craft, tugs, and other vessels which navigate either out of sight of land or at night, but the hunter, hiker, camper, aviator, etc., can use it as a radio compass in unfamiliar territory and use it as a portable radio as well.

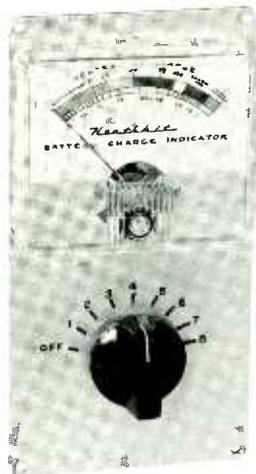
The DF-1 is powered by a 9-volt battery (a spare is included with the kit which can be kept in the special clip provided for it in the cabinet). The frequency range covers the broadcast band from 540 to 1620 kc. The broadcast band was selected for this unit since broadcast stations are numerous, easy to identify and tune in.

A directional high-Q ferrite antenna is incorporated which is rotated from the front panel by a nylon right-angle gear drive to obtain a fix on a station. A 1 milliampere meter serves as the null and tuning indicator. The DF-1 is very easy to operate. You simply select a station and rotate the antenna for minimum deflection on the tune portion of the meter. To find the direction of a station you set the sensitivity control and rotate the antenna for maximum reading on the null portion of the meter. The maximum null will occur when the antenna is in line with the station being received. Direction can be read on the compass rose or antenna index incor-

porated. The controls consist of: tuning, volume and power (on-off), sensitivity, heading indicator (compass rose), and bearing indicator (antenna index). A six-to-one vernier is provided on the tuning condenser to allow precision tuning.

The DF-1 is supplied with slip-in-place mounting brackets, which allow easy removal from ship bulkheads or other similar places. Overall dimensions are 7½" W. x 5⅝" H. x 5⅝" D. Highest quality components are used throughout in construction with each part clearly marked to aid in identification. In addition, moisture and fungus-proofing lacquer is supplied with the kit to coat all components after assembly and prevent corrosion. Construction is simplified through the use of detailed step-by-step instructions and pictorial diagrams. Even the beginner with little or no electrical experience can build this unit successfully. The IF transformers are prealigned so it is ready to operate as soon as construction is completed. For best results however, a slight touchup of alignment would be recommended to compensate for minor variations in components and wiring as explained in the manual. Calibration instructions are simple and easy to accomplish with alignment tool furnished. No special equipment is required for alignment. Information is also given on the proper use of the completed unit. The bibliography section of the manual lists bulletins and publications which can be obtained for additional navigation information.

This light, compact unit will provide you with a means of enjoyment as well as serving a very useful function. Shpg. Wt. 5 lbs.



\$16⁹⁵ MODEL
CI-1



By Daystrom

MARINE BATTERY

Charge Indicator KIT

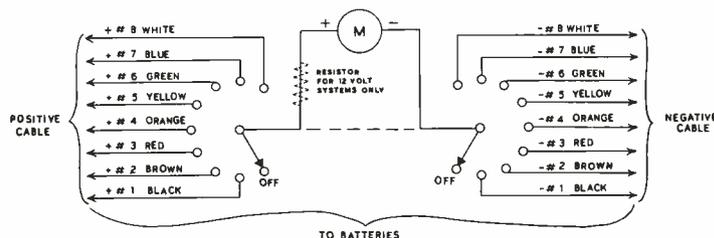
FEATURES

- Indicates condition and charge of batteries for safe cruising.
- Hermetically sealed waterproof meter.
- Chrome plated, solid brass panel.
- Checks one, or as many as eight storage batteries.
- Easy to install—requires minimum space on instrument panel.

SPECIFICATIONS

Operation.....	Indicates proper charging rate and condition of batteries in 6 or 12 volt systems.
Checks.....	1 to 8 separate batteries of lead acid type, regardless of size. All wire and cable supplied.
Meter.....	Special-design, hermetically sealed.
Panel.....	Chrome plated, solid brass.
Dimensions.....	2 $\frac{1}{8}$ " W. x 5 $\frac{1}{4}$ " H. x 2" D.
Shipping Weight.....	.3 lbs.

The Heathkit model CI-1 Marine Battery Charge Indicator was designed especially for the boat owner. It is intended to replace the hydrometer method of checking storage batteries, and to eliminate the necessity for working with acid in small, below-decks enclosures. Now it is possible to check as few as one, or as many as eight storage batteries, merely by turning the switch and watching the meter. A glance at the meter tells you instantly whether your batteries are sufficiently charged for safe cruising. State of charge is indicated on a four-color scale. Operates on either 6 or 12 volt systems using lead acid batteries, regardless of size. The simple installation can be accomplished by the boat owner in fifteen minutes. Dimensions are 2 $\frac{1}{8}$ " W. x 5 $\frac{1}{4}$ " H. x 2" D. Although designed mainly for marine use the CI-1 has also found extensive use in service stations, power stations, and radio stations where banks of bat-



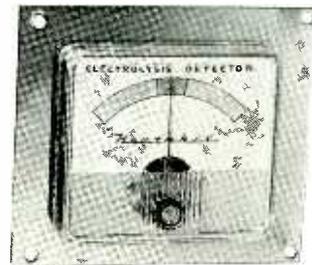
teries are kept in reserve. It can also be used in new automobiles that do not have an ammeter, to note the actual condition of the battery instead of only indicating whether it is charging or discharging. Continuously indicates percentage of charge without running the battery down. It also locates defective or weak batteries and indicates the proper charging rate. A nine-position switch is provided so that the state of charge of each battery can be read in turn, as the switch is rotated. If less than eight batteries are in the system will be in use, and only on these will a reading be noted. Only the highest quality of components are used in marine kits such as hermetically sealed waterproof-meter, and chrome plated, solid brass panel. Engineered in accordance with Navy requirements to insure long service life. Shpg. Wt. 3 lbs.

HEATHKIT

Electrolysis Detector KIT

The Heathkit model ED-1 Electrolysis Detector indicates the extent of electrolysis currents between the boat's common ground and underwater fittings, except on boats having metal hulls. These currents, undetected, could cause gradual corrosion, and deterioration of the propeller or other metal fittings. It is particularly helpful when installing electrical equipment of any kind, or to determine proper polarity when power is obtained from a shore sup-

ply. Easy-to-build, the model ED-1 consists of a hermetically-sealed waterproof meter, a special sensing plate, and sufficient wire to install, including the necessary hardware. Mounts on instrument panel where it can be easily seen. Nautically styled to match other instruments. The ED-1 is equally applicable for salt or fresh water. Requires no power for operation, and gives instant warning to guard your boat for a life-time. Shpg. Wt. 2 lbs.



MODEL **\$9⁹⁵**
ED-1



By Daystrom

Fuel Vapor Detector KIT

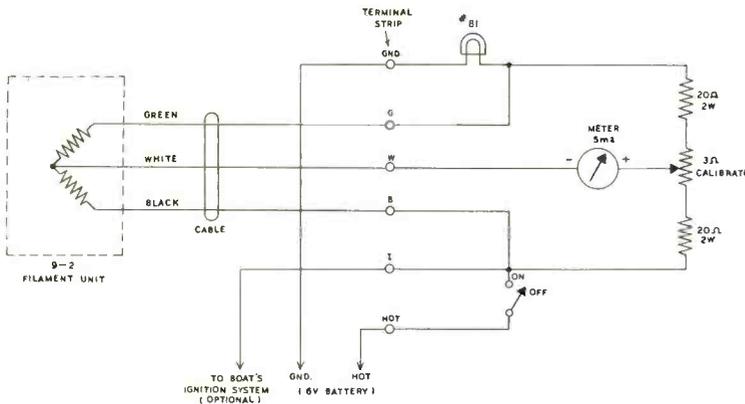
FEATURES

- Hermetically sealed meter—chrome-plated panel.
- Simple "safe-dangerous" indicator scale.
- Explosion-proof detector unit with spare element.
- Complete with heavy-duty neoprene-insulated cable.
- Easy to build and install on your boat.



MODEL FD-1-6
(6 volt)
MODEL FD-1-12
(12 volt)

\$35⁹⁵ Each



SPECIFICATIONS

Operation	Indicates explosion potential of fuel vapor. Protects an area of approximately 1000 cubic feet.
Detector	Two glass-enclosed filaments encased in an explosion-proof monel metal screened housing (spare detector filament unit included with kit).
Cable	Heavy duty, neoprene insulated.
Meter	Hermetically sealed waterproof meter with 3-color scale.
Panel	Brass—chrome plated.
Power requirements	FD-1-6 6 volts DC at 1 amp. FD-1-12 12 volts DC at 1 amp.
Dimensions	3¼" W. x 7⅞" H. x 3⅞" D.
Shipping Weight	4 lbs.

All boat owners are safety conscious—particularly when it comes to the very real dangers of explosion from combustible fumes accumulating in the engine compartment, or in other sections of the craft. The Heathkit Fuel Vapor Detector has been designed to set your mind at ease concerning fuel vapor problems by indicating the explosion potential in whatever part of the boat the detector unit is placed.

The indicator mounts on or near your instrument panel—so the presence of fumes can be seen on the meter, before the ignition is turned "on". A three-color "safe-dangerous" scale immediately shows if it is safe to start the engine. A pilot light on the front panel shows when the detector is operating, and it can be left on continuously, or just used intermittently. Having this reliable indicator

right at hand is more than a convenience; it is a necessity, for the safety of everyone aboard, and as protection for your investment in the boat itself.

The detector is connected to the indicator by a heavy-duty neoprene-insulated cable, highly resistant to the effects of oil and gasoline. A panel control enables initial calibration of the detector when installed. The indicator features a hermetically-sealed meter and a chrome-plated brass panel. It is very simple to build and install, even by one not having previous experience.

The FD-1-6 (6 volts DC) and FD-1-12 (12 volts DC) operate from your boat batteries. The kit is complete in every detail, even to the inclusion of a spare detector unit. It constitutes a small price to pay for the safety of yourself, your family, and your boat! Shpg. Wt. 4 lbs.



MODEL \$14⁹⁵
PM-1

HEATHKIT RF POWER METER KIT

The Heathkit RF Power Meter Kit is designed to sample the RF field in the vicinity of your transmitter, whether it be marine, mobile, or fixed. It requires no batteries, electricity, or direct connection to the transmitter. The power meter is merely placed in some location close to the transmitter, to pick up RF radiation from the antenna which is then indicated on a panel meter. It provides you with a continuous indication of transmitter operation. You can easily detect if power is dropping off by comparing present meter readings with past ones.

The PM-1 operates with any transmitter having output frequencies between 100 kc and 250 megacycles, regardless of power. Sensitivity is 0.3 volts RMS full scale, and a special control on the panel allows for further adjustment of sensitivity. The meter is a 200 ua unit, mounted on a chrome-plated brass panel. Housed in a plastic case the entire PM-1 measures only 3¼" W. x 6¼" L. x 2" D. An easy way to put your mind at ease concerning transmitter operation. Shpg. Wt. 2 lbs.

*buy from the
pioneer in "do-it-yourself" electronics
and save*



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