

**HEATHKIT**

**TEST EQUIPMENT**

THE NEW  
1954  
HEATHKIT CATALOG

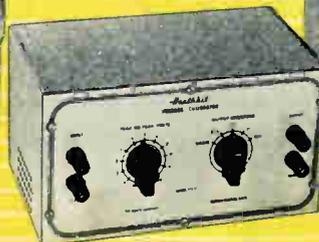
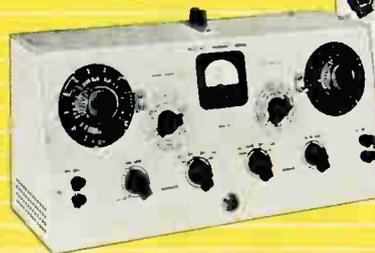
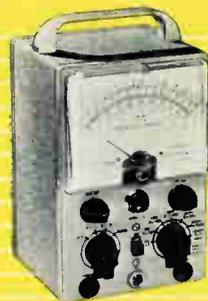
AMPLIFIERS ...  
RECEIVERS ...  
AMATEUR RADIO

**HEATH COMPANY**

BENTON HARBOR  
MICHIGAN

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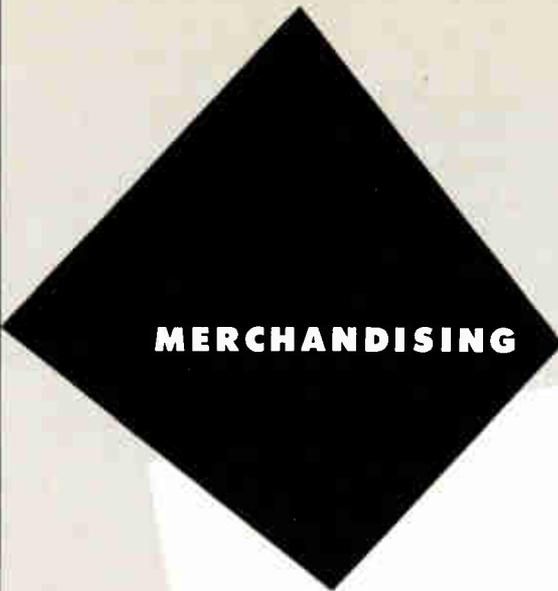
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*The* primary appeal of Heathkits lies in the availability of a wide range of thoroughly useful and highly desirable electronic equipment in kit form at a substantial price advantage. The Heath Company consistently uses high quality materials yet, in turn, offers to its thousands of customers, down-to-earth prices that make Heathkits the greatest value in the electronic industry.

When the Heath Company began pioneering in the electronic kit field, it was decided that to best serve its customers all sales would be made only on a direct factory-to-customer basis. This by-passing of the jobber or distributor completely eliminated the necessity for an additional margin of profit on each transaction. The direct result of this reduction in cost of kit distribution is reflected in high component quality and a greater saving to you, the purchaser. A concrete example is the famous Heathkit VTVM. Of the twenty-one resistors specified in the parts list, fourteen are 1% deposited carbon precision resistors and only seven are composition carbon types. Comparison with competitive instruments on this one point alone quickly shows why Heathkits offer the highest dollar value in the field.

*Here* is yet another advantage of Heathkit direct merchandising. You weigh the facts, make your selection and place your order in the comfort and convenience of your own home. No one influences your decision with glib salesmanship. Delivery of the kit is made right to your door by parcel post or express. Just think of the ease of doing business in this way.

By buying directly from the manufacturer your closer contact with the company results in faster service for you. In event you require assistance or replacement material, the facilities of the Company are poised, waiting and ready to help. No dealing through an intermediate supplier who must necessarily wait to obtain replacement parts from the factory.

There are other advantages in buying kit form equipment. Through your own assembly and construction of the kit instrument, labor costs are eliminated and the obvious saving is passed on to you. Important, practical knowledge is gained regarding basic principles of the operation involved. Much closer checking of calibration accuracy can be maintained through the very fact that you can accomplish the necessary calibration yourself. Too, you have been logically trained to quickly make any necessary repairs that might be required.

*Finally,* there is the thrill and personal satisfaction in the knowledge that you alone have built the instrument. Show the results of your own effort to your friends and associates with pride. No price tag can include the warm glow of personal accomplishment.

A very important point that we would like to stress is that it will always be our honest, sincere desire to produce the highest quality kit form equipment at the lowest possible cost to you. We are ready at all times to assist the Heathkit owner in every way for we want every Heathkit user to receive the many years of excellent operation for which his kit was designed and engineered.



# ENGINEERING

*Heath Company* operation requires many forms of engineering other than that of actually developing new kit form electronic equipment. We are concerned not only with new equipment, but also with further improving the standard accepted instruments we already offer.

A tangible example is the recent modernization of the Heathkit Probe kits. A good variety of Heathkit Accessory Probes has been available for several years. These probes were useful and fairly priced. However, investigation of newer construction techniques revealed the possibility of substantial improvement. This resulted in increased sales volume which, in turn, permitted further price reduction. Now an entire kit package of five probes is made available to Heathkit customers for little more than the price of some individual factory-built probes.

*Another* example of flexible Heath Company engineering is the production of instrument control panels. Usual practice of instrument manufacture is to use a control panel with stamped or etched calibrations. Heathkits use aluminum panels that are enameled and infra-red baked. Panel calibrations are applied by the means of a fast silk screen process and then given a protective clear coat of long lasting finish. Production requirements call for a change in panel calibrations? Simple. Merely replace with the correct silk screen and production is resumed without a limiting factor of advance supply of stamped or etched panels to be considered. Heathkit panels are attractive and professional looking. Just another one of the cost saving Heathkit operations.

*Consider* a component such as the range switch of the VTVM. Circuit design required a two deck rotary switch of rather unusual requirements. A suitable manufacturer's stock model would leave a number of unused terminals for switch connections not required in this particular application. Because of Heathkit volume production, the design and use of a specialized switch is warranted. This eliminates unnecessary component construction, saves possible error through confusion on the part of the kit builder and results in lower overall component cost.

Because of this flexibility of Heath Company operation, it is possible to take full advantage of every opportunity that will result in a better product at still further saving to you, our customers.



*Another* recent innovation in Heathkit design is the increasing use of copper-plated chassis and sheet metal parts. In addition to the performance improvement gained through the use of copper plating by giving due consideration to "skin effects" present at higher frequencies, the copper plating improves the overall appearance and imparts that "professional look" to the instrument. Another improvement apparent in some of the newer Heathkits is the use of newly styled Heathkit control knobs. These knobs are of our own design and made to our specifications; a good example of the careful consideration the Heath Company gives to even the smallest details.

# THE *New* MODEL 0-9 HEATHKIT 5" PUSH-PULL



## FEATURES

- New 5UP1 cathode ray tube — grid screen supplied.
- Voltage regulation — retrace blanking amplifier.
- Extended band width — improved frequency response.
- Z axis input — access to deflection plates.
- Astigmatism control for spot shape adjustment.
- Peak-to-peak calibrating provision.
- New heavy duty shielded power transformer.
- 5 position horizontal input selector switch.
- Push-pull deflection amplifiers.
- New harness wiring — 11 tube circuit.

MODEL 0-9  
**\$59.50**  
SHIPPING  
WT. 28 LBS.

## DESIGN

Announcing the newest addition to a brilliant series of Heathkit Oscilloscopes, the outstanding new Model 0-9 instrument. Incorporates all of the fine features developed and proven in the production of well over 60,000 Scope kits, more than produced by any other manufacturer, in addition to a host of new design features for truly fine performance.

This new Oscilloscope kit features a brand new (no surplus) 5UP1 cathode ray tube for really fine hairline focusing, good intensity and freedom from halation.

The 5" cathode ray tube still remains the recognized standard size for design and industrial laboratories, development engineers, lab technicians and service men. The only size CR tube offering a wide range of phosphors, types, colors and persistence. Oscilloscope accessories, such as cameras, filters, etc., are designed for use with the 5" types. The additional advantage of lower initial and replacement cost, as well as permitting more compact instrument construction, should also be considered. The answer to improved Oscilloscope operation still lies in good basic design and sound engineering.

## NEW FEATURES

Efficient voltage regulation is now featured to maintain rock steady trace stabilization in spite of line voltage variation. New retrace blanking amplifier circuit provides single trace observation. Band width of the vertical amplifier has been further extended through more efficient circuit design. Calibrated 1 volt peak-to-peak reference conveniently available from panel. Panel-to-chassis-to-amplifier wiring is simplified through the use of pre-cabled color coded wiring harness for that "factory built" look. Maximum operating flexibility provided by horizontal amplifier, 5 position input selector switch.

New heavy duty shielded power transformer with adequate operating reserve. The Heathkit Model 0-9 still features Z axis input and a readily accessible terminal board for direct connection to deflection plates. Astigmatism control for good spot shape, vertical input frequency compensated step attenuator, full range multivibrator, sweep generator and many other fine design features have been retained.

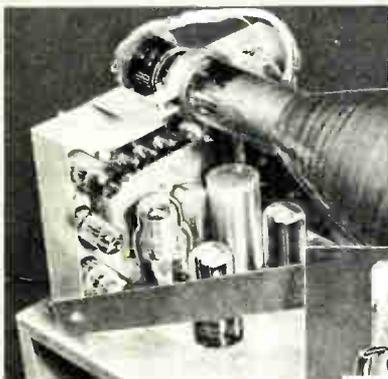
## VERTICAL AMPLIFIER

Newly designed vertical amplifier features further improvement in band width characteristics through additional circuit refinements. High impedance input with vertical gain control in low impedance cathode follower circuit for minimum distortion. Step attenuated, frequency compensated cathode follower 6AB7 in vertical input stage coupled to twin triode 12AT7 connected as high gain Cascade amplifier. Phase splitter 6C4 properly drives another 12AT7 used as a balanced push-pull high gain deflection amplifier.

Through good design technique, square wave response up to 500 kc is obtainable; the real acid test of good scope operation. The input circuit is properly compensated by using stable, low loss, quality ceramic trimmer condensers instead of twisted wires so commonly used.

## HORIZONTAL AMPLIFIER

An outstanding new feature of the horizontal amplifier circuit is a 5 position input selector switch providing operating choice of external input—line sweep—line sync—internal sync and external sync. Amplifier circuit uses a 12AU7 input stage, one half of which is used as a triode phase splitter with dual controls in plate and cathode circuits



Illustrating location of type OD3 voltage regulator tube used to supply constant plate voltage to amplifier input circuits regardless of line voltage variations.

Terminal board conveniently accessible through port at rear of cabinet for direct connection to deflection plates or for intensity modulation input.



## SPECIFICATIONS

Vertical: Frequency Response	±2 db 10 cycles to 2 mc ±6 db 5 cycles to 3 mc
Sensitivity	0.025 volts per inch at 1 kc
Input Impedance	47 μf shunting 2 megohm X1 position 35 μf shunting 2 megohm X10-100 position
Horizontal: Frequency Response	±6 db 10 cycles to 500 kc
Sensitivity	0.6 volts per inch at 1 kc
Input Impedance	25 μf shunting 1 megohm
Sweep Generator	Multivibrator-frequency range of 10-50,000 cps
Tube Complement	1—5UP1 Cathode Ray Tube 1—6AB4 Vertical Input 1—12AU7 Horizontal Input and Blanking 1—OD3 Regulator 1—6C4 Vertical Phase Splitter 4—12AT7 Multivibrator, Vertical Cascade Amplifier, Horizontal and Vertical Deflection Amplifiers. 2—5Y3GT Low and High Voltage Rectifiers
Dimensions	8 5/8" wide x 14 1/8" high x 16" deep
Power Requirements	105-125 volts 50/60 cycle, 70 watts

4 **RETRACE BLANKING AMPLIFIER — Z AXIS INPUT**

# OSCILLOSCOPE KIT

for smooth control and balanced drive of the 12AT7 push-pull high gain deflection amplifier. The remaining half of the 12AU7 input stage is used as a retrace blanking amplifier. Circuitry also features a phasing control and a calibrated 1 volt peak-to-peak reference terminal.

## MULTIVIBRATOR SWEEP GENERATOR

Incorporates a twin triode multivibrator stage for producing a good, stable saw-tooth sweep frequency. Features 4 position frequency selector switch in conjunction with frequency vernier control. Synchronizing control permits internal synchronization on either positive or negative peaks. Panel terminal for external sync when desired. Retrace blanking amplifier positively eliminates retrace, preventing possible confusion with the trace under observation.

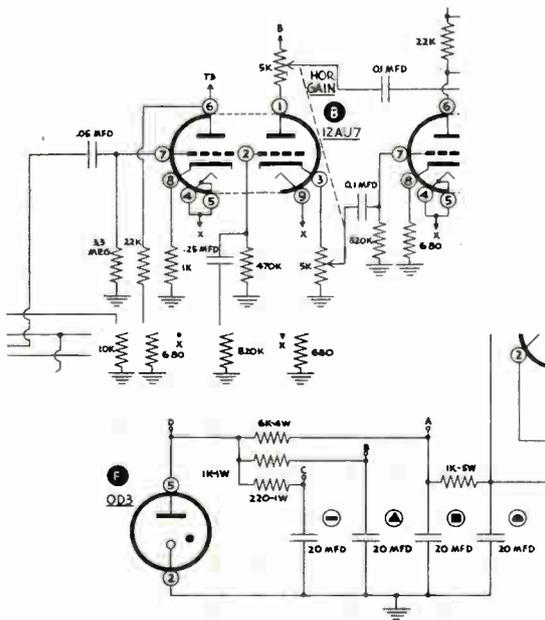
## POWER SUPPLY

A new power supply system is responsible for many of the 0-9 improvements. New heavy duty internally shielded power transformer provides generous operating reserve and merely "loafs along" under normal operating requirements. New high voltage filtering system insures good intensity and hairline focusing through steady supply of adequate accelerating potential to CR tube. Overall instrument protection is afforded by a fuse in the AC power supply line.

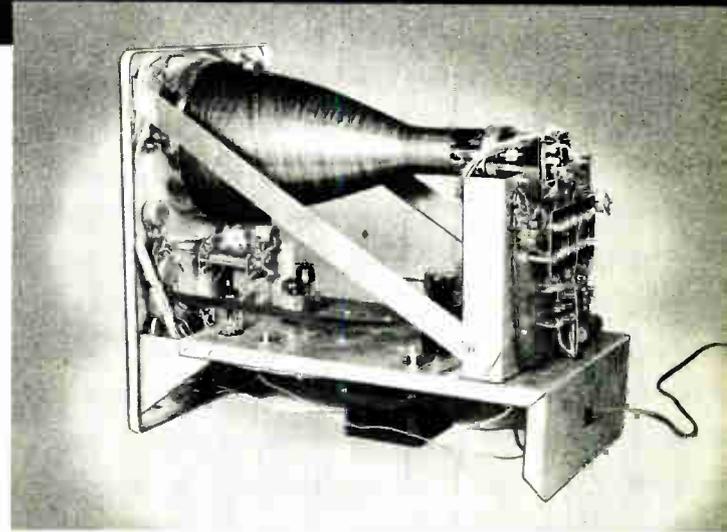
Voltage regulation used in the B+ distribution network regulates plate supply to vertical input stage, Cascade amplifier and horizontal input stage. Cascade amplifier and horizontal input stage. Insures rock steady traces regardless of line voltage variations. No more trace bounce or jitter so characteristic of unregulated sensitive Oscilloscopes.

We believe this instrument to be the ideal all-round general purpose, low cost oscilloscope for educational and industrial use, radio and TV servicing or any other type of work requiring the instantaneous reproduction and observation of actual wave forms and other electrical phenomena.

**BLANKING AMPLIFIER**—Partial schematic showing circuit location of blanking amplifier providing positive blanking of retrace. Eliminates possibility of confusion.

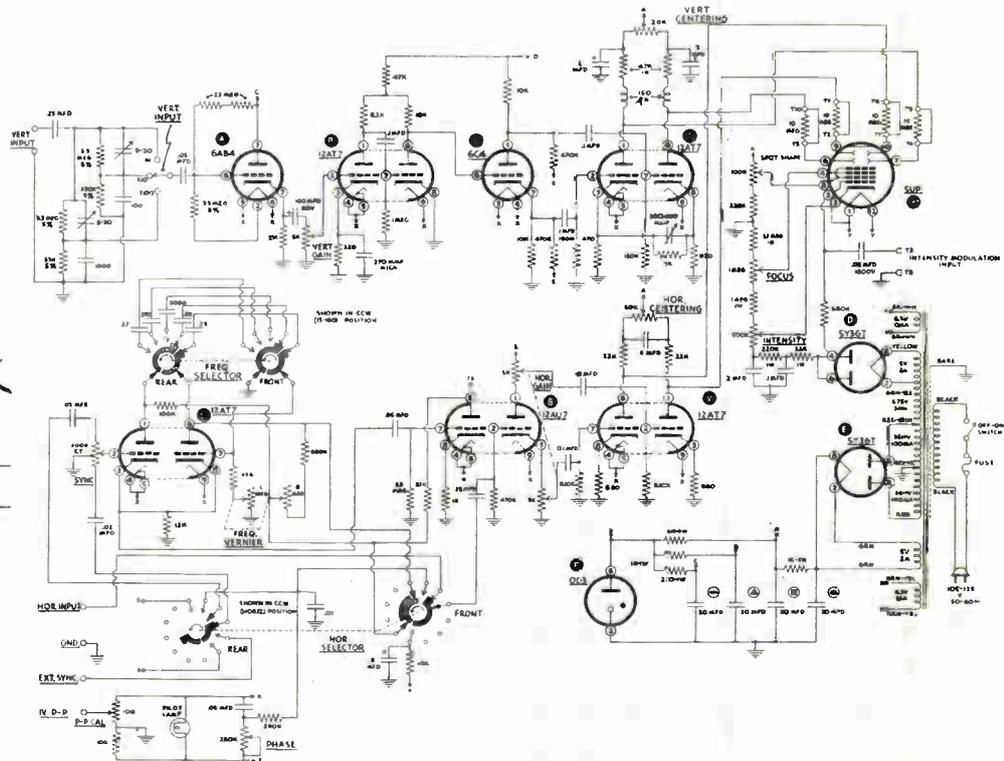


**VOLTAGE REGULATION**—Schematic representation of voltage regulation operation in B+ power distribution network.



## APPLICATIONS

Observing electrical phenomena of all kinds . . . TV and radio service work . . . adjusting AM-FM receivers . . . amplifier circuits . . . alignment work . . . AC voltage and current measurements . . . frequency measurements . . . phase measurements . . . study of differentiation and integration circuits . . . power rectifier and filter circuits . . . oscillator circuits . . . study of phase relationship . . . multivibrator circuits . . . practical wave form analysis. Used in laboratories . . . service shops . . . radio stations . . . recording studios . . . schools . . . ham shacks . . . relay networks . . . etc.



# Heathkit ELECTRONIC SWITCH KIT



The basic function of the Heathkit Electronic Switch kit is to permit simultaneous oscilloscope observation of two separate traces which can be either separated or superimposed for individual study. This is accomplished through the use of two individually controlled inputs working through amplifier, multivibrator and blocking stages. The output of the Electronic Switch is connected directly to the vertical input of the oscilloscope. A typical example would be simultaneous observation of a signal or wave form as it appears at both the input and output stages of an amplifier.

An Electronic Switch has many applications to increase the overall operating versatility of your oscilloscope. It can be used to check amplifier distortion—audio crossover networks—phase inverter circuits—to measure phase shift—special wave form study, etc. The instrument can also be conveniently used as a square wave generator over the range of switching frequencies often providing the necessary wave form response information without incurring the expense of an additional instrument. Ownership of this instrument will reveal many entirely new fields of oscilloscope application and will quickly justify the modest cost of the Electronic Switch.

## SPECIFICATIONS

Approximate Switching Rates	(continuously variable) Low range.....less than 10 cps to 100 cps. Middle range.....50 cps to 400 cps. High range.....250 cps to 2 000 cps.
Tube Complement	2—6SJ7, 2—6SN7, 1—6X5
Controls	Gain A control, gain B control, position control, coarse frequency control and fine frequency control.
Physical Specifications	10½" deep x 5½" wide x 6¾" high.
Power Requirements	110-125 volts AC 50-60 cycles at 25 watts.

MODEL S-2

**\$23.50**

SHIP. WT. 11 LBS.

# Heathkit VOLTAGE CALIBRATOR KIT

Another useful oscilloscope accessory particularly in circuit development work or in TV and radio service work. The Voltage Calibrator provides a convenient method for making peak-to-peak voltage measurements with an oscilloscope by establishing a relationship on a comparison basis between the amplitude of an unknown wave shape and the known output of the Voltage Calibrator. Peak-to-peak voltage values are read directly on the calibrated panel scale without recourse to involved calculations.

To offset line voltage supply irregularities the instrument features a voltage regulator tube. A convenient "signal" position on the panel switch by-passes the calibrator completely and the signal is applied to the oscilloscope input thereby eliminating the necessity for transferring test leads.

With the Heathkit Voltage Calibrator it is possible to measure all types of complex wave forms within a voltage range of .01 to 100 volts peak-to-peak. Build this instrument in a few hours and enjoy the added benefits offered only through combination use of equipment.



MODEL VC-2

**\$11.50** SHIP. WT. 4 LBS.

## SPECIFICATIONS

Ranges	(Using peak to peak volt control and output multiplier switch) 0-.1 volt, 0-10 volts, 0-100 volts (Variable control divides steps into 1 to 10)
Tube Complement	1—6AL5, 1—OB2
Input Impedance	Approximately 25 MMF with signal fed through calibrator.
Physical Specifications	8½" wide x 4¾" high x 4¾" deep.
Power Requirements	110-125 volts AC 50-60 cycles at 5 watts.

## PROBE KITS

All Heathkit Accessory Probe kits, with the exception of the 336 High Voltage Probe kit, have been redesigned for easier assembly, sturdier construction and improved appearance, all at a lower price level. This price reduction is made possible through standardization of basic material requirements and increased sales volume.

The new Probe kits are attractively styled featuring polished aluminum housing for mechanical strength and good electrical shielding properties, two color polystyrene probe ends for easy assembly and high insulation factor, low capacity, low loss polyethylene insulated shield cable and completely revised simplified construction and application sheets; another typical example of the advantages offered only through kit form construction. A complete assortment of Heathkit Accessory Probes can be purchased for little more than the price normally quoted for one commercially available factory built probe.

**SPECIAL OFFER!** Buy all five probes in one kit. No. 375 at \$19.50. Shipping Wt. 5 lbs. Five probes for little more than the usual price for one factory built probe. Save \$6.00 over last year's prices.

## Heathkit LOW CAPACITY PROBE KIT



No. 342  
**\$3.50** SHIP. WT. 1 LB.

Oscilloscope investigation of high frequency, high impedance or broad band width circuits encountered in television work requires the use of a Low Capacity Probe to prevent loss of gain, circuit loading or wave form distortion. The Heathkit Low Capacity Probe features a variable capacitor to provide correct instrument impedance matching. The adjustment is simple, accurate and stable. As an added advantage in flexibility of operation, the ratio of attenuation can be varied.

## Heathkit SCOPE DEMODULATOR PROBE KIT



No. 337-B  
**\$3.50** SHIP. WT. 1 LB.

In applications such as trouble shooting or aligning TV, RF, IF and Video stages the frequency ranges encountered often require demodulation of signals before oscilloscope presentation. The Heathkit Scope Demodulator Probe kit will easily fulfill this function and readily prove its value as an oscilloscope service accessory; another perfect example of extended instrument usefulness through the addition of an economical, functional Demodulator Probe kit.

# Heathkit HANDITESTER KIT

The Heathkit Model M-1 Handitester readily fulfills major requirements for a compact, portable volt-ohm-milliammeter. The small size of the smooth, gleaming, molded bakelite case permits the instrument to be tucked into your coat pocket, tool box or glove compartment of your car; always the "Handitester" for those simple repair jobs. Despite its compact size, the Handitester is packed with every desirable feature required in an instrument of this type . . . AC or DC voltage ranges, full scale, 10, 30, 300, 1,000, and 5,000 volts . . . Two convenient ohmmeter ranges, 0-3,000 ohms and 0-300,000 ohms . . . Two DC milliammeter ranges, 0-10 milliamperes and 0-100 milliamperes. The instrument uses a 400 microampere meter movement which is shunted with resistors to provide a uniform 1 milli-ampere load on both AC and DC ranges. This allows the use of but one set of 1% precision divider resistors on both AC and DC and provides a simplicity of switching with only one switch. A small hearing aid type "ohms adjust" control provides the necessary zero adjust function on the ohmmeter range. The AC rectifier circuit uses a high quality Bradley rectifier in a dual halfwave hookup. The dual halfwave type was chosen because of its excellent linear characteristics. A 1½ volt flashlight battery, fitted in a special battery bracket mounted inside the cabinet is used in ohmmeter operation. The entire instrument is easily assembled from complete instructions and pictorial diagrams. Necessary test leads are included in the price of this extremely popular kit.



MODEL M-1  
**\$14.50**  
SHIP. WT. 3 LBS.



MODEL BT-1

**\$8.50** SHIP. WT.  
2 LBS.

## Heathkit BATTERY TESTER KIT

The new Heathkit Battery Tester measures all types of dry batteries with test ranges of 0-15 volts and 0-180 volts under load conditions of 100 ma and 10 ma. Readings are made directly from a three color GOOD-WEAK-REPLACE scale that your customers can readily understand. Operation is extremely simple and merely requires that the leads be connected to the battery under test. The test leads are furnished with convenient phono tip plugs for easy insertion in plug-in type batteries. Only one control to adjust in addition to a panel switch for A or B battery types. The Heathkit Battery Tester features compact assembly, accurate meter movement and a three deck wire wound control all mounted in a portable, rugged, plastic cabinet. Use the BT-1 to check portable radio batteries, hearing aid batteries, lantern batteries, etc. Use of the Heathkit Battery Tester will not only provide accurate service information, but also represents an ideal method of stimulating battery sales. The kit is supplied complete with all necessary construction material and instruction booklet.



### Heathkit 30,000 VOLT D.C. PROBE KIT

No. 336  
**\$4.50**  
SHIP. WT.  
2 LBS.

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.



### Heathkit PEAK-TO-PEAK PROBE KIT

No. 338-B  
**\$5.50**  
SHIP. WT.  
2 LBS.

Now read peak-to-peak voltages on the DC scale of the Heathkit 11 megohm VTVM. Readings can be directly made from the VTVM scales without involved calculations. Measurements over the frequency range of 5 kc to 5 mc. Use this Probe to extend the usefulness of your VTVM in radio and TV service work.



### Heathkit R. F. PROBE KIT

No. 309-B  
**\$3.50**  
SHIP. WT.  
2 LBS.

The Heathkit R. F. Probe used in conjunction with any 11 megohm VTVM will permit RF measurements up to 250 mc ±10%. A useful, convenient accessory for those occasions when RF measurements are desired. Ideal for further extending service applications of your Heathkit VTVM.

SAVE \$6.00 OVER LAST YEAR'S PRICES!

# Heathkit VACUUM TUBE

## FEATURES

- High impedance 11 megohm input
- 1% high quality precision resistors
- New 1.5 volt full scale range — well over 2 1/4" scale length per volt
- 15,000 volt upper DC range
- Center scale zero adjust position
- Increased accuracy through 50% greater scale coverage
- Large 4 1/2" 200 microampere Simpson meter
- Individual AC and DC calibration for maximum accuracy
- New professional instrument styling

This beautiful Vacuum Tube Voltmeter, the Heathkit Model V-6, is the world's largest selling kit instrument. Now many new outstanding features are offered, in addition to retaining all of the refinements developed and proven in the production of over 100,000 VTVM's. Seldom does any instrument completely dominate its field in this manner and this leadership has been obtained through actual proven experience as verified by the enthusiastic response of satisfied customers. There are many reasons for the outstanding leadership of the Heathkit VTVM. The performance level provides every desirable VTVM function. It is priced so low that any one who works with electrical measurements cannot afford to be without one. Quality of components leaves nothing to be desired—precision resistors—sensitive meter—standard tubes—quality controls and switches—compact

handsome cabinet. High input resistance assures accurate voltage measurements and voltage ranges have been selected for service convenience. Investigate the many proven points of superiority and be convinced that this instrument will also help you in your work.

## WHAT IT WILL DO FOR YOU

Functional operation was the primary consideration in the design of this instrument. The large 4 1/2" Simpson 200 microampere meter provides sensitivity and performance far beyond the average kit instrument level. All DC, AC and resistance scales are printed in a crisp, sharp easy-to-read black type. Db scales in red for quick reference. The meter movement is housed in an exclusive design dust-proof plastic case with a replaceable shatter-proof cover. For maximum accuracy and flexibility of operation the mechanical zero adjust screw is accessible on the meter cover.

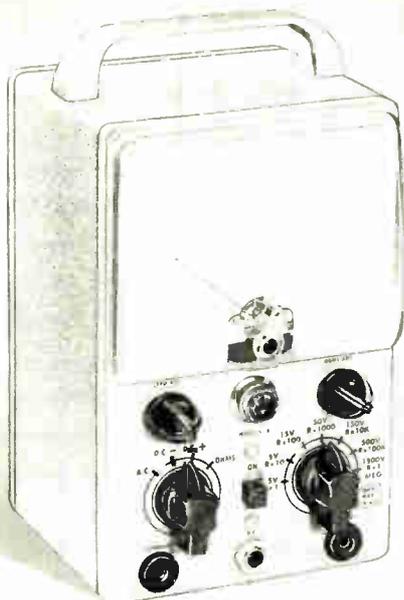
Only two main controls to operate; the selector switch to establish the type of measurement to be made and a range switch for proper coverage. For convenience of operation the ohms adjust and zero adjust control knobs are panel mounted. Meter voltage ranges were selected for service convenience. Seven ranges full scale 0-1.5, 5, 15, 50, 150, 500, 1500 AC and DC (1000 volt upper limit on AC). Seven ohmmeter ranges with terrific coverage from .1 ohm to 1000 megohms. Polarity reversal switch eliminates necessity for transferring test leads during measurement operation. For further convenience during FM alignment work or any application where null indications are desired, a center scale zero adjust position has been provided.

## DESIGN-STYLING

In the design of the Heathkit VTVM, every consideration was given to ease of assembly. Arrangement of switches, tube sockets and calibrate controls is such that lead length is held to an absolute minimum. The vertically mounted chassis and bracket assembly provides complete protection of wiring and components regardless of the position in which the instrument is placed during construction.

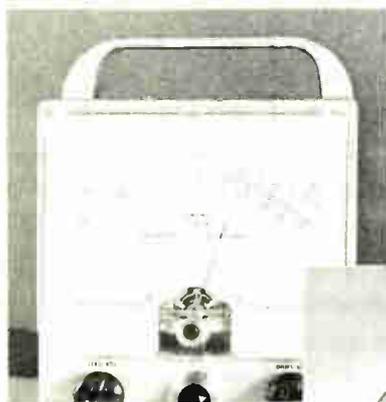
The VTVM is a smart, good looking instrument of balanced proportion. The cabinet styling has eliminated sharp corners and recessed flanges permit a snug fit of the smooth drawn panel. A beautiful two-color baked enamel panel further adds to the overall professional appearance. Experience has proven that an infra-red baked enamel panel finish will withstand many years of hard service use. Panel calibrations are further protected by a clear, transparent coat.

Even control knobs are of exclusive Heathkit design and manufacture, assuring a consistent, steady supply of standardized type knobs.



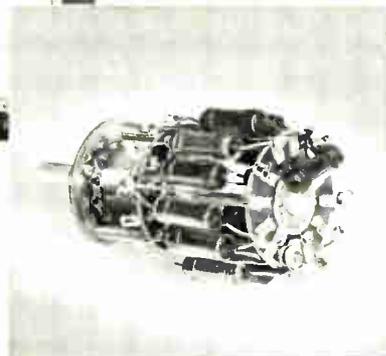
### SCALE

Two color, black and red, meter scales for quick identification of ranges and maximum legibility. Center scale zero position for FM alignment.



### SWITCH

Range switch designed for this specific application. No unused or blank terminals to confuse the kit builder.



## SPECIFICATIONS

- D. C. Voltmeter: 7 Ranges:** 0-1.5, 5, 15, 50, 150, 500 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.
- Electronic AC Voltmeter: 7 Ranges:** 0-1.5, 5, 15, 50, 150, 500, 1,500, (1000V Max.)  
Scales reading R.M.S. (1.707 of positive peak).  
Diode with adjustable compensation.
- Circuit:** Scale with 10 ohms center x1, x10, x100, x1000, x10K, x100K, x1 Meg. Measures .1 ohm to 1,000 megohms with internal battery.
- Electronic Ohmmeter: 7 Ranges:**
- Meter:** 4 1/2" Streamlined case with 200 microampere movement.  
**Multipliers:** Precision type.  
**Tubes:** 1—12AU7 Twin triode meter bridge.  
1—6H6 7-pin diode AC rectifier.
- Power Supply:** Power transformer and selenium rectifier.
- Battery:** 1 1/2 volt flashlight cell.
- Power requirements:** 105-125V 50/60 Cycle AC, 10 Watts.
- Cabinet Size:** 7 1/8" high x 4 1/16" wide x 4 1/8" deep.
- Kit Shipping Weight:** 6 pounds.

## APPLICATIONS

Wide range of DC voltage measurements with negligible circuit loading . . . AC voltage measurements . . . Resistance and db scale . . . Center scale zero adjustment for FM alignment . . . Frequency response measurements . . . General radio and TV servicing . . . Continuity checking . . . output meter . . . maintenance of electrical equipment . . . and any other application requiring a basic measurement function.

# VOLTMETER KIT

## COMPONENTS

All components used in the V-6 VTVM are of standard, first line quality. The multiplier circuits use deposited carbon 1% precision resistors instead of following the usual practice of supplying matched pairs of common carbon resistors. Switches have been especially designed for this particular instrument and represent every possible consideration from an ease of assembly standpoint. Standard brand commercially available tubes, tube sockets, condensers, controls, etc. minimize service problems in event component replacement should be required.

The instrument is transformer operated and line isolated for safety of operation when used with universal type radio or TV circuits. The power supply utilizes a modern, selenium rectifier in conjunction with a conventional RC filter network.

All hardware furnished with the kit is bright, clean, new material specifically selected for this particular application. A complete set of flexible, shielded and rubber covered test leads, including probes, is included. Tubes supplied with this kit have been "aged" and checked to insure proper instrument operation.

## CONSTRUCTION MANUAL

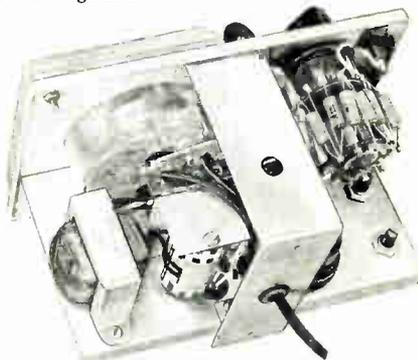
The construction manual supplied with the VTVM sets a new standard in instructional information. In this manual the detailed step-by-step check off assembly procedure has been followed throughout to insure trouble free construction. In addition to outlining instrument assembly, the manual describes the theory of instrument operation and illustrates actual application in measurement work. For further convenience, large scale pictorials are provided which can be fastened to the area above the workbench for quick reference.

The Heath Company is justifiably proud of the fact that the VTVM manual is in demand for instructional work in various educational programs and that it has set a new pattern level for the entire kit industry.

### TEST LEADS

All necessary test leads are furnished with this kit. After assembly, the VTVM is ready to use without purchasing further equipment.

Open construction—easy to wire—logical arrangement.



Self protecting chassis design—can be placed in any position.

## CIRCUIT

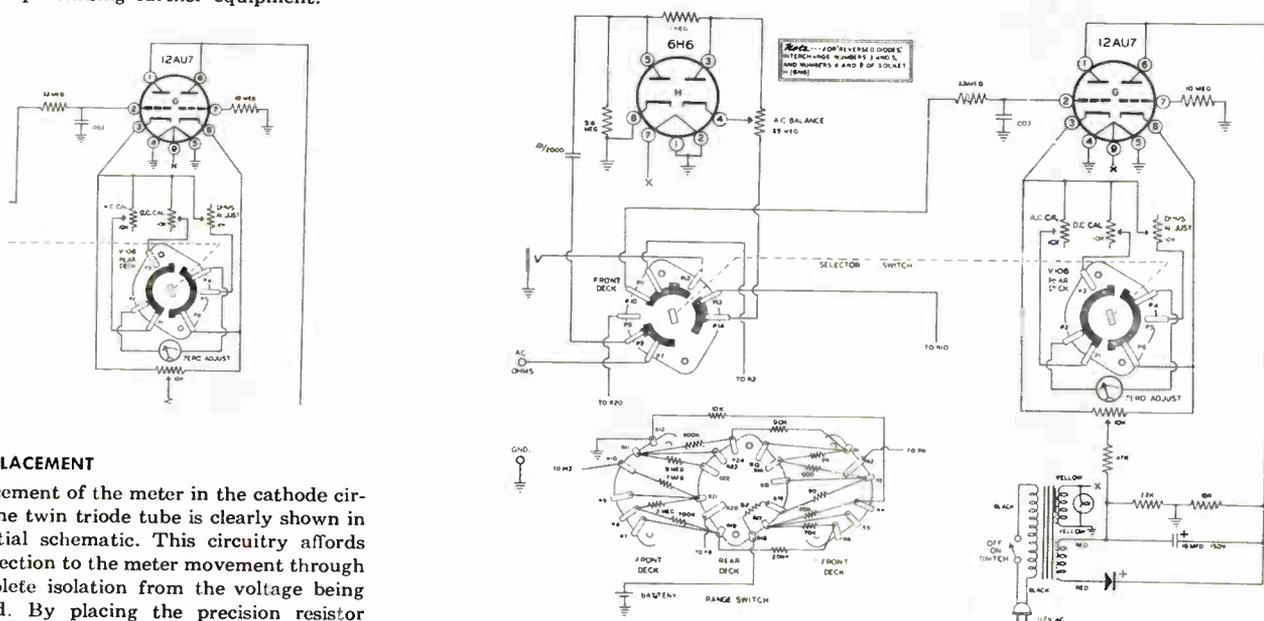
The Vacuum Tube Voltmeter has many advantages over the non-electronic voltmeter. Of primary importance is the high input resistance. This enables much more accurate readings to be obtained in high impedance circuits such as resistance coupled amplifiers, oscillator circuits and AVC networks. It prevents circuit "loading."

Calibration of the instrument is simple and is accomplished by the adjustment of the AC and DC calibrate controls. These controls are in series with the meter and are adjusted to produce full scale reading with the proper test voltage applied to the instrument.

Maximum test voltage which is applied to the 12AU7 tube is about 3 volts. Higher test voltages are reduced by a voltage divider which has a total resistance of 10 megohms. An additional resistance of 1 megohm is located in the DC test prod thereby permitting measurements to be made in circuits carrying RF with a minimum disturbance of such circuits.

For AC voltages in the audio range, a shunt diode is used to provide a DC voltage proportional to the peak of the applied AC voltage. This DC voltage is applied through a voltage divider to the twin triode causing the meter to indicate.

For resistance measurements a 1.5 volt battery is connected through a string of multipliers of 1% tolerance and the external resistance to be tested, thus forming a voltage divider across the battery. A resultant portion of the battery voltage is applied to the twin triode. The meter scale is calibrated in resistance.



### METER PLACEMENT

The placement of the meter in the cathode circuit of the twin triode tube is clearly shown in this partial schematic. This circuitry affords real protection to the meter movement through its complete isolation from the voltage being measured. By placing the precision resistor voltage divider circuit between the input circuit and the 12AU7 tube, voltages under investigation cannot harm the meter movement in a properly constructed circuit.

This schematic clearly illustrates the basic simplicity and good design of the Heathkit VTVM.



# Heathkit AUDIO WATTMETER KIT

## FEATURES

- Built-in non-inductive load resistances.
- Direct reading meter scales.
- Wide power range—flat frequency response.
- Precision multiplier resistors.
- 4½" 200 microampere meter movement.
- 4 diode meter bridge circuit.
- Attractive ventilated cabinet.
- Only low price Audio Wattmeter available.

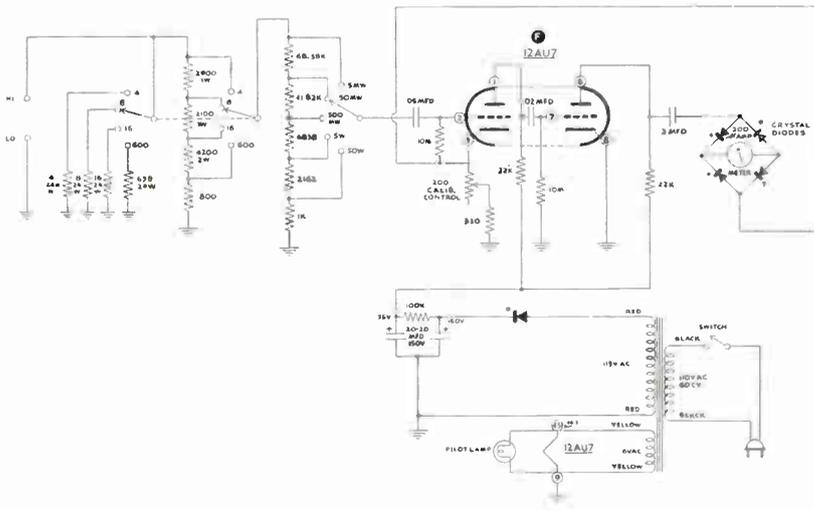
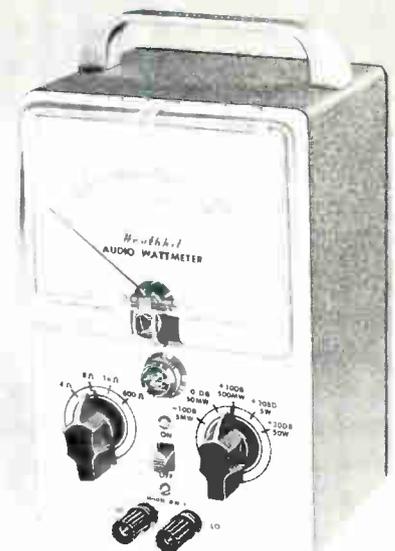
A new Heathkit design for the audio engineer, serious hi-fi enthusiasts or for use in recording studios or broadcast stations, the Heathkit Audio Wattmeter kit. This specialized instrument instantly indicates the output level of the equipment under test without requiring use of separate external load resistors. All readings are taken directly from the calibrated scales of the 4½" 200 microampere Simpson meter.

The Heathkit Audio Wattmeter features 5 full scale power measurement ranges from 5 milliwatts up to 50 watts with db ranges of -15 db to +48 db. The instrument has a power measurement rating of 25 watts continuous and 50 watts maximum for intermittent operation. Non-inductive resistance load impedances of 4, 8, 16 and 600 ohms are provided through an impedance selector switch. Frequency effect is negligible from 10 cycles to 250 kilocycles. A conventional VTVM circuit utilizes a 12AU7 twin triode tube and the meter rectifier bridge circuit uses four germanium diodes for good linearity. This new instrument will help to supply the answers to your audio operating or power output problems.

MODEL AW-1

\$29.50

SHIPPING  
WT. 6 LBS.



## SPECIFICATIONS

- Frequency Response ..... ± 1 db, 10 cycles to 250 kc  
 Wattage Range ..... 0.5 milliwatts, 50 milliwatts, 500 milliwatts, 5 watts, 50 watts full scale.  
 dB Ranges ..... Total range, -15 db to +48 db, scale -5 to +18 db (1 mw—600). Five switch selected ranges from -10 db to +30 db.  
 Load Resistors ..... 4, 8, 16 and 600 non-inductive, switch selected.  
 Audio Input Power Ratings ..... Up to 25 watts maximum continuous duty, 50 watts maximum intermittent. Duty cycle 50 watts is 3 minutes. Ventilated cabinet allows efficient cooling.  
 Multipliers ..... Precision type.  
 Meter ..... 4½" streamlined case with 200 microampere movement.  
 Meter Rectifier ..... Crystal diode bridge for wide range frequency response.  
 Tube ..... 12AU7—voltage amplifier and current amplifier for meter.  
 Power Supply ..... Power transformer and selenium rectifier.  
 Dimensions ..... 7 1/8" high x 4 1/2" wide x 4 1/2" deep.  
 Power Requirements ..... 105 125 volt AC, 50/60 cycle, 6 watts.

## PRODUCTION FACILITIES

This photograph dramatically illustrates one of the major reasons why Heathkits can be economically produced and still maintain a high quality level.

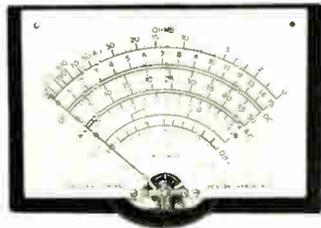
The particular operation involved is the bending of the chassis used in the Heathkit 6-Watt Amplifier, part of a 2,500 chassis production run. Prior to this forming operation the chassis was cut from sheet steel stock, punched, notched and trimmed. The next operation will be a hot acid cleaning bath, zinc plating and then the final painting operation. In the paint room the chassis is again cleaned, a primer spray coat applied before the final characteristic Heathkit gray hammertone finish.

By this concentration of production facilities on one particular unit, it is possible to realize maximum efficiency at lowest cost per unit. Similar economies are obtained through the same application of production techniques in other phases of Heathkit operation. No other kit instrument company operates on this production scale and therefore it is impossible for them to pass on similar savings to their customers. Heathkits truly offer the highest dollar value obtainable in the electronic kit industry.



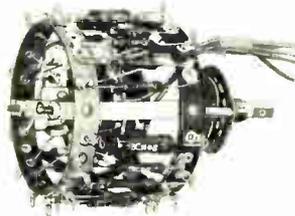
YOU SAVE BY ORDERING DIRECT FROM MANUFACTURER

# The BRAND NEW 20,000 OHMS PER VOLT Heathkit



### METER SCALES

Meter scales are arranged in logical sequence for maximum legibility. Two color for quick identification of ranges.



### RESISTOR ASSEMBLY

All 1% precision multiplier resistors openly mounted on a novel resistor ring-switch assembly for easy wiring before unit installation.

MODEL MM-1  
**\$26.50**  
SHIPPING  
WT. 6 LBS.

## FEATURES

- 20,000 ohms per volt sensitivity DC, 5,000 ohms per volt AC.
- Polarity reversal switch — eliminates transferring of test leads.
- All 1% precision multiplier resistors.
- Sensitive 50 microampere 4½" Simpson meter.
- Meter ranges selected for service convenience.
- New resistor ring-switch assembly.
- Total of 35 meter ranges on two color scale.
- New modern cabinet styling — attractive appearance.

## DESIGN

Another brand new Heathkit representing one of the most important additions to an already world famous series of electronic kit instruments. The new Heathkit Multimeter is a "must" to complete the instrument line-up of any well equipped service shop. Here is an instrument packed with every desirable service feature, many of which are not found in other multimeters. All of the measurement ranges you need or want. High sensitivity, 20,000 ohms per volt DC and 5,000 ohms per volt AC and new, modern, attractive cabinet styling. An instrument you will be proud to own and use.

Three distinct operating advantages are offered by the Heathkit Multimeter. Complete portability through freedom from AC line power operation—provides service ranges of direct current measurements from 150 microamperes up to 15 amperes —can be safely operated in RF fields without impairing accuracy of measurement. An unusual feature of operation seldom found in multimeters is a polarity reversal switch which eliminates the need for transferring test leads.

## RANGES

This instrument uses 1% precision multiplier resistors in conjunction with a 4½" Simpson 50 microampere meter for a total of 35 meter ranges. Voltage ranges of the MM-1 were entirely selected for service convenience. For example, 1½ volt full scale low range for measuring portable radio filament voltages, bias voltages, etc. provides over 2¼" of scale length per volt. 150 volt full scale range for AC-DC service work. 500 volt full scale range for conventional transformer operated power supply systems. Complete voltage ranges AC and DC 0-1.5-5-50-150-500-1500-5000 volts. Direct current ranges 0-150 microamperes, 15 milliamperes, 150 milliamperes, 500 milliamperes, 15 amperes. Resistance measurements from .2 ohms to 20 megohms x1 x 1000 x 10,000. Db coverage from -10 db to +65 db. Individual ranges are switch selected and determined through the position of a function switch. Separate ohms adjust control provided.

## COMPONENTS

Compare the quality, then compare the price. We cannot overemphasize the quality of components used in the construction of this fine kit instrument. It is rare to find an instrument in this price range using all 1% deposited carbon type precision resistors in multiplier circuits and, for additional accuracy, a sensitive 4½" 50 microampere Simpson meter has been specified. The range and function switches were particularly designed for this specific instrument application as was the unique resistor ring-switch assembly, in keeping with the Heath Company policy of using specialized components wherever their use is warranted. The ohmmeter batteries are mounted in special clips on a laminated phenolic mounting board for ready accessibility. Meter scales are clearly legible and printed in two colors for quick identification. A sharp, crisp black for DC voltage, current and resistance measurements and a bright red for AC and db scales.

## 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.

# MULTIMETER KIT

## CONSTRUCTION

The assembly of this outstanding instrument has received very careful design consideration which has resulted in a unique resistor ring-switch mounting assembly procedure. With this method of assembly, the precision resistors are wired to the rings and range switch before actual mounting of the switch to the panel. This procedure affords the advantage of simpler construction yet accessibility of precision resistors in event a replacement is ever required. Completion and installation of the precision resistor ring-switch assembly represents a major portion of instrument construction, and remaining wiring is comparatively simple.

Ohmmeter batteries were selected for convenience of replacement and only standard commercially available types are used. Batteries consist of one type C flashlight cell and four pen light cells. Batteries and necessary test leads are supplied with the kit.

## CABINET

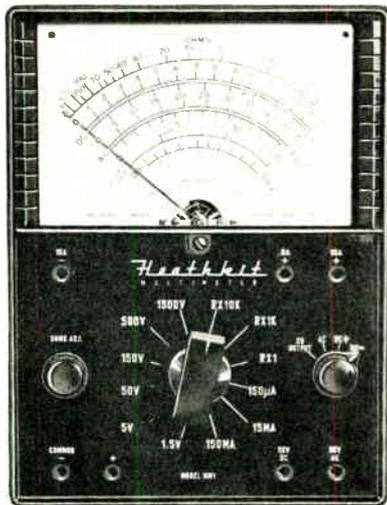
Cabinet styling of the Heathkit MM-1 represents departure from conventional enclosures which provide purely functional requirements. In addition to providing complete dust-proof enclosure protection for the instrument, the Heathkit MM-1 cabinet features strikingly modern cabinet styling of durable Bakelite with easy-to-read panel designations. Overall cabinet size is 5½" wide x 4" deep x 7½" high, providing good physical stability.

The instrument panel is at a slightly inclined angle to facilitate control operation and identification of functions. The meter movement is placed in a recessed position for maximum non-glare readability. Test leads, banana jacks are all of the recessed safety type eliminating shock hazard to the operator.

The attractive plastic carrying handle and chrome plated external hardware provide the finishing touch to the appearance of the completed instrument. The Heathkit MM-1 represents a terrific instrument value for a high quality 20,000 ohms per volt unit using all 1% deposited carbon type precision resistors. Here is quality, performance, functional design and attractive appearance all combined in one low priced package.

## METER

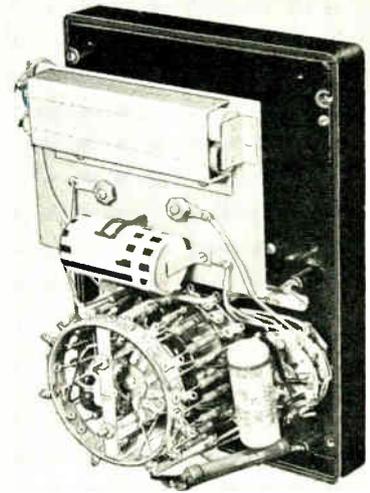
Sensitive 50 microampere 4½" Simpson meter mounted in recessed position for glare-proof observation of the two color scales.



## PANEL

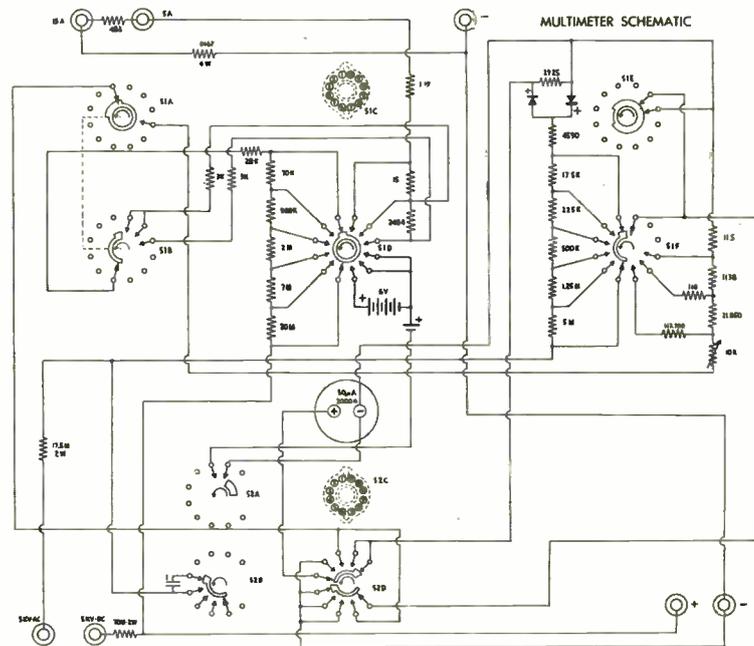
Control panel slightly inclined to facilitate control operation and identification of functions.

This inside photo illustrates the open, simplified construction of the MM-1. Complete instrument assembly is made to the cover of the two piece Bakelite cabinet. Note the accessibility of all components and the ease with which battery replacements can be made.



## APPLICATIONS

In radio and TV service work for accurate measurement of voltage — current — resistance, etc., as encountered in circuit work. Can be used in transmitter maintenance for commercial and amateur stations as the accuracy of the instrument is not affected by RF fields. Home appliance servicing for checking operating voltages, continuity, wiring, switches, lamps, relays, fuses, etc. Automobile mechanics will find it useful for checking car electrical wiring, generators, starters, batteries. Movie equipment, two-way communication systems, air conditioning, or any application requiring the measurement of voltages, current or establishing continuity of cable, wiring, connectors, etc. Can be used in many applications involving marine and aircraft electrical systems.



The schematic of the Heathkit Model MM-1 Multimeter kit clearly shows the basic simplicity of design and the ease with which the various circuits and functions can be traced.

# Heathkit BAR GENERATOR KIT

## SPECIFICATIONS

Carrier Frequency	.....	60 to 80 megacycles
Modulating Frequencies	.....	113 to 172 KC
Radio Frequency (Horizontal Linearity)	.....	480 cps. (Approx.)
Low Frequency (Vertical Linearity)	.....	100,000 microvolts
Output Voltage	.....	12AT7
Tube	.....	Transformer operated half-wave selenium rectifier
Power Supply	.....	8 1/8" wide, 4 3/4" high, 4 3/4" deep
Dimensions	.....	6 lbs.
Shipping Weight	.....	105-125 volts, 50-60 cycles AC
Power Requirements	.....	

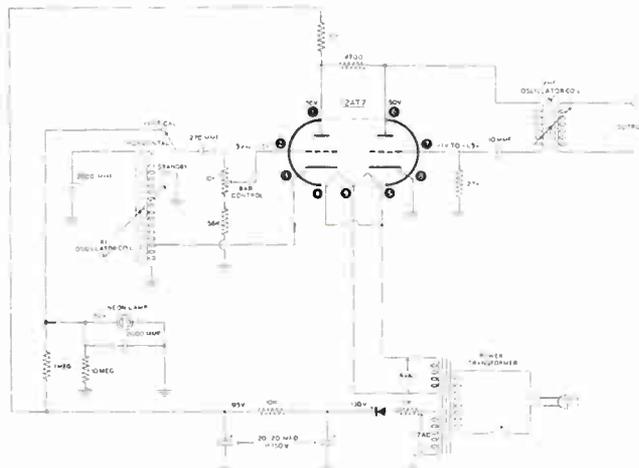


**MODEL BG-1**  
**\$14.50**  
**SHIPPING WT. 6 LBS.**

The Heathkit BG-1 Bar Generator represents another welcome addition to the fast growing line of popular Heathkits. The station transmitted test pattern is rapidly disappearing and the Bar Generator is the logical answer to the TV service man's problem in obtaining quick, accurate adjustment information without waiting for test patterns.

The Heathkit BG-1 produces a series of horizontal or vertical bars on a TV screen. Since these bars are equally spaced they will quickly indicate picture linearity of the receiver under test. Panel switch provides "stand by position"—"horizontal position"—"vertical position." The oscillator unit utilizes a 12AT7 twin triode for the RF oscillator and Video carrier frequencies. A neon relaxation oscillator provides low frequency for vertical linearity tests. The instrument will not only produce bar patterns, but will also provide an indication of horizontal and vertical sync circuit stability as well as overall picture size.

Instrument operation is extremely simple and merely requires connection to the TV receiver antenna terminal. The unit is transformer operated for safety when used in conjunction with universal or transformerless type TV circuits.



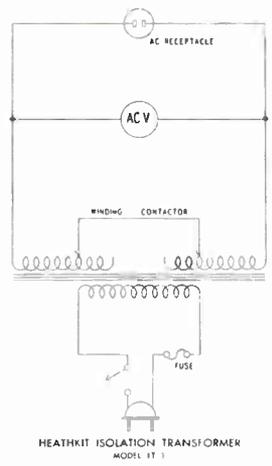
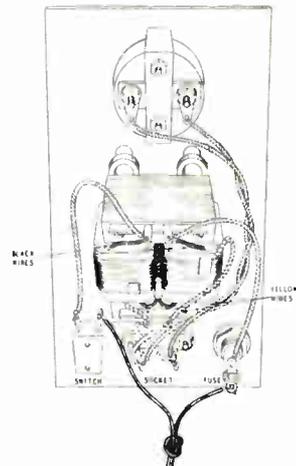
# Heathkit VARIABLE VOLTAGE ISOLATION TRANSFORMER KIT

**MODEL IT-1**  
**\$16.50**  
**SHIPPING WT. 9 LBS.**



This new Heathkit Isolation Transformer will provide line isolation for AC-DC radios—TV receivers—small appliances—motors—noise radiating devices, etc. Not to be confused with the usual hazardous auto transformer type line voltage "booster." Panel control permits variation of secondary for output voltage between the range of 90 and 130 volts AC. For convenience of operation, a panel mounted AC voltmeter provides constant monitoring of output voltage which is available from a convenient panel mounted receptacle. Under extreme cases of overload, the power transformer winding is protected with a 2 ampere slo-blow type fuse.

The entire unit is simple to construct and assemble. Assembly can be completed in a matter of minutes to provide years of useful service. Contained in a sturdy well-ventilated cabinet and rated at 100 volt amperes continuously or up to 200 volt amperes intermittently.



## APPLICATIONS

The Heathkit Isolation Transformer fulfills numerous requirements in radio and TV service shops. Complete line isolation while servicing AC-DC radios and TV receivers. Variable supply voltage to simulate varying conditions of operation—to increase voltage in order to induce breakdowns of intermittent components—determine actual voltage cut-off level of oscillator circuit in radios, three way portables, etc.

TV service men will find the Isolation Transformer particularly useful for servicing transformerless type TV circuits. Let it help you by simplifying service alignment and trouble shooting problems through isolation of a "hot" TV chassis. The variable voltage feature will prove very useful in low line voltage areas. A quick, convincing demonstration can be made for the benefit of your customer to verify that reduced picture size or shrinking is not the fault of the TV receiver itself. Continued usage will suggest many additional applications for this versatile unit.

# NEW IMPROVED *Heathkit* TUBE CHECKER KIT

## FEATURES

- Simplified harness wiring
- Improved, smooth, anti-backlash roll chart action
- Adequate roll chart illumination
- Individual element switches
- Portable or counter style cabinet
- Spare blank socket
- Contact type pilot light test socket
- Simplified test set-up procedure
- Line adjust control
- Large 4½" three color meter

*This new Heathkit Tube Checker will prove its value in building service prestige through usefulness—simplified operation—attractive, professional appearance. Don't overlook the fact that the kit represents a saving up to \$50.00 over the price of comparable commercially built equipment. At this low kit price, no serviceman need be without the advantages offered by the Heathkit Tube Checker.*

The New Model TC-2 Heathkit Tube Checker features many circuit improvements, simplified wiring, new roll chart drive and illumination. The instrument is primarily designed for the convenience of radio and TV service men and will check the operating quality of tubes commonly encountered in this type of work. Test set-up procedure is simplified, rapid and flexible. Panel sockets accommodate 4, 5, 6, and 7 pin tubes, octal and loctal, 7 and 9 pin miniatures, 5 pin Hytron and a blank socket for new tubes. Built-in neon short indicator, individual three position lever switch for each tube element, spring return test switch, 14 filament voltage ranges and line set control to compensate for supply voltage variations all represent important design features of the TC-2. Results of tube tests are read directly from the large 4½" Simpson three color meter calibrated in terms of Bad—?—Good; information that your customer can readily understand. Checks emission, shorted elements, open elements and continuity.

**NEW FEATURES.** The use of closer tolerance resistors in critical circuits assures correct test information and eliminates the possibility of inaccurate test interpretation. Improvement has been made in the mechanical roll chart drive system eliminating diagonal running, erratic operation and backlash. The thumb wheel gear driven action is smooth, positive and free running. As an additional feature, the roll chart is illuminated for easier reading, particularly when the tube checker is used on radio or TV home service calls.

**NEW WIRING.** Wiring procedure has been simplified through the extended use of multiwire color coded cable, providing a harness type installation between tube sockets and lever switches. This procedure insures standard assembly and imparts that "factory built" appearance to the instrument. Completely detailed information is furnished in the new step-by-step construction manual regarding the set-up procedure for testing of new or unlisted tube types. No delay necessary for release of factory data.



## New HEATHKIT Portable TUBE CHECKER KIT

MODEL TC-2P

**\$34.50** SHIP. WT. 14 LBS.

The portable model is supplied with a strikingly attractive two tone cabinet finished in rich maroon Proxylon impregnated fabric covering with a contrasting grey on the inside cover. Detachable cover, brass plated hardware, sturdy plastic handle help to impart a truly professional appearance to the instrument.

**PORTABLE TUBE CHECKER CABINET.** Portable Tube Checker cabinet as described above will fit all earlier Heathkit TC-1 Tube Checkers. Shipping weight 7 lbs. Cabinet only 91-8 . . . \$7.50

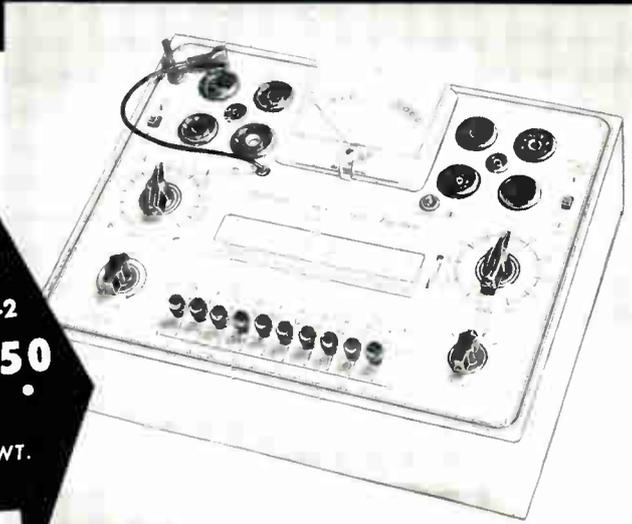
## Heathkit TV PICTURE TUBE TEST ADAPTER

The Heathkit TV Picture Tube Test Adapter used with the Heathkit Tube Checker kit will quickly check for emission, shorts, etc., and determine picture tube quality. Consists of standard 12 pin TV tube socket, 4 feet of cable, octal socket connector and data sheet.

No. 355  
Ship. Wt. **\$4.50**  
1 lb.

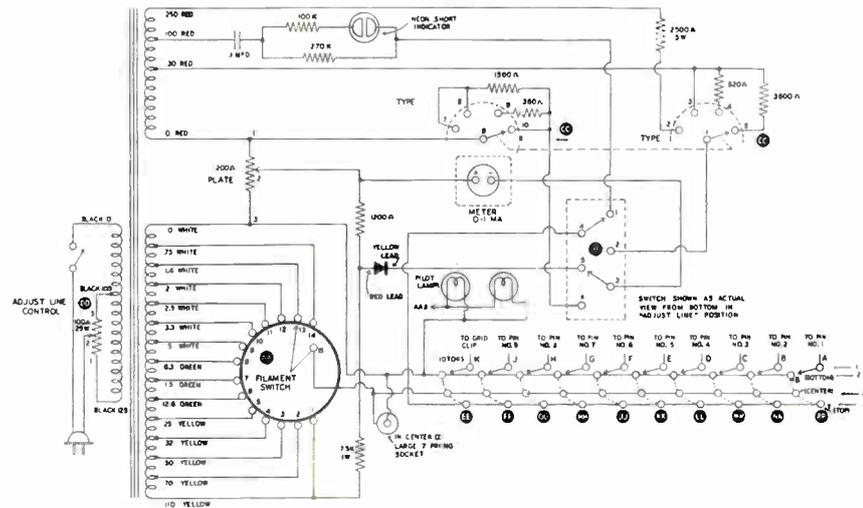


MODEL TC-2  
**\$29.50**  
SHIPPING WT. 12 LBS.



## CIRCUIT DESCRIPTION

One of the power transformer secondary windings features a series of taps to accommodate the wide range of filament voltage requirements. Such an arrangement assures placement of correct filament voltage on the hundreds of tubes listed on the chart, and the filament switch makes the proper connection. Another tapped secondary winding supplies plate voltages of 30, 100 and 250 volts. In test procedure the proper AC plate voltage is applied across the tubes between filament and plate and the tube under test conducts as a half wave rectifier. The filaments and cathode are connected together as are the plate and grid. The plate adjust control adjusts the sensitivity and the Bad—Good meter which is in the circuit at the same time. The roll chart gives the setting for plate adjust control and a good tube with the sensitivity of the meter properly set will have sufficient cathode emission to swing the meter needle to record "good." If tube emission is too low the conducting current of the tube will not be high enough to bring the needle into the "good" section, but rather in the "?" or "bad" section. The cathode emission is checked and a relative indication of overall tube performance is obtained.

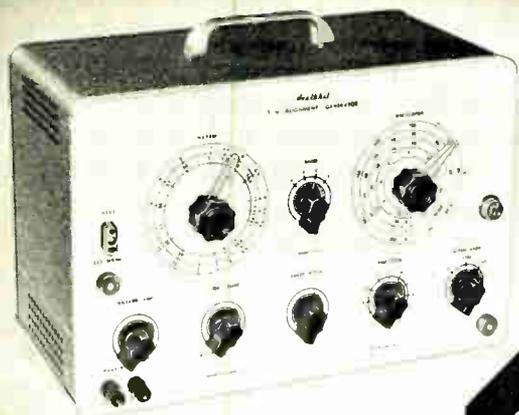


**IMPROVED, SMOOTH ROLLING CHART ACTION—ILLUMINATED**

# NEW Heathkit TELEVISION

## FEATURES

- \* **INCREDUCTOR** controllable inductor sweep
- Oscillator operation entirely on fundamentals
- 4 mc—220 mc coverage includes FM spectrum
- Maximum RF output well over .1 volt
- Automatic amplitude control circuit—constant output
- Triple marker system—4.5 crystal supplied
- Voltage regulation for stability
- Advanced high frequency design technique
- New compact modern instrument styling
- All three sets of low loss, low capacity shielded cables included.

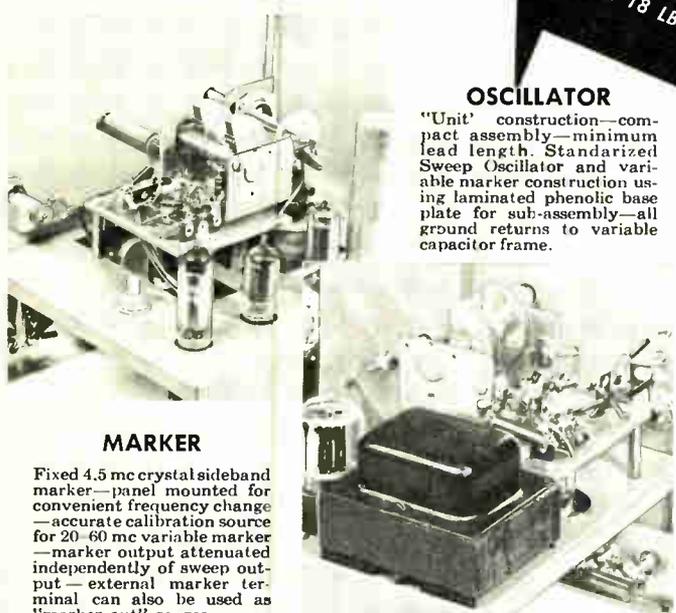


MODEL TS-3  
**\$44.50**  
 SHIPPING  
 WT. 18 LBS.

The Heath Company is proud to announce the release of the most radically improved Sweep Generator in the history of the television service industry. This instrument development was undertaken with full realization of the many problems facing the television service man, and the Heathkit Model TS-3 will fulfill every service requirement. This new model instrument represents a radically new approach to the alignment generator problem. An entirely new sweep system provides a range of sweep deviation from 0 to 50 megacycles depending upon base frequency—output voltage in excess of .1 volts—linearity flat  $\pm 1$  db throughout entire frequency range due to a unique automatic amplitude control circuit—new triple marker system featuring dual built-in markers, a variable 19–60 mc marker with calibrated third harmonics covering 57–180 mc—a crystal controlled 4.5 mc sideband with provisions for external marker use. Now, for the first time, it is possible to follow TV manufacturers' alignment procedure bulletins and accurately obtain fractional frequencies such as 24.75 mc, 41.25 mc, etc., with an accuracy limitation governed only by the accuracy of the crystal marker.

### OSCILLATOR

"Unit" construction—compact assembly—minimum lead length. Standardized Sweep Oscillator and variable marker construction using laminated phenolic base plate for sub-assembly—all ground returns to variable capacitor frame.



### MARKER

Fixed 4.5 mc crystal sideband marker—panel mounted for convenient frequency change—accurate calibration source for 20–60 mc variable marker—marker output attenuated independently of sweep output—external marker terminal can also be used as "marker out" source.

### ADVANCED DESIGN

The basic design of the new Heathkit TS-3 Television Sweep Generator follows latest high frequency techniques. For example, operation of the automatic amplitude control circuit is governed by the RF output level of the swept oscillator. As the oscillator circuit output varies throughout the instrument frequency range, the circuit action is stabilized through corresponding variation in plate supply voltage to the oscillator. Therefore, the oscillator plate voltage is variable between the ranges of 35 to 180 volts through the action of the automatic amplitude control circuit. This unique circuit is responsible for the flat output of the TS-3 Sweep Generator.

### CONSTRUCTION AND OPERATION

The construction manual supplied with this kit follows the conventional Heathkit step-by-step assembly procedure, incorporates a complete circuit description and theory of instrument operation and also supplies detailed information regarding various procedures used in actual alignment work. Typical alignment problems are shown and carried through using the Sweep Generator and an oscilloscope, and further mention is made of additional equipment such as RF Signal Generator, etc. The construction manual therefore fulfills two requirements; a complete construction and assembly manual, as well as an alignment procedure and service technique reference.

This new instrument represents truly outstanding instrument performance at an unbelievably low price level, considering the many new design features offered. No effort has been spared to make this Sweep Generator the ideal service instrument for every TV service man.

### \*INCREDUCTOR

The Increductor controllable inductor, which is the very heart of the oscillator circuit, is a device in which the value of inductance can be adjusted by means of a variable control current. No moving parts are required to obtain this adjustment as the inductance variation is achieved by a change in the magnetic state of the core in which the inductor is wound. The control current influences the effective permeability of the core material and this permeability in turn determines coil inductance so therefore it is obvious that by influencing the perme-

### SPECIFICATIONS

Frequency Range	4 mc to 220 mc on fundamentals Four overlapping ranges
Output	Over .1 volt regulated
Output Impedance	50 ohms
Sweep deviation	From 0–15 mc, minimum to 0–50 mc, maximum depending on frequency
Fixed Frequency marker	4.5 mc plug-in crystal
Variable Frequency marker	19 mc–60 mc fundamentals 57 mc to 180 mc calibrated harmonics
External marker	Any external frequency. Mixed with crystal and variable marker will provide three marker pips. Use as marker "out" source.
Attenuators	Step and "fine" for sweep oscillator. Separate control for marker amplitude.
Blanking	Two-way automatic blanking circuit provided to insure sharp oscillator cut-off.
Phasing	Wide range phasing control.
Tube Complement	12AT7 Swept oscillator—buffer 12AT7 variable and crystal marker oscillator 12AU7 Blanking clipper 6AQ5 Series hi-voltage regulator 6AU6 Regulator control OA2 Control tube constant reference 6X5 Rectifier
Cabinet Dimensions	13" wide x 8½" high x 7" deep
Power Requirements	110–125 volts AC 50/60 cycles 60 watts

\*Trademark, C. G. S. Laboratories, Stamford, Connecticut

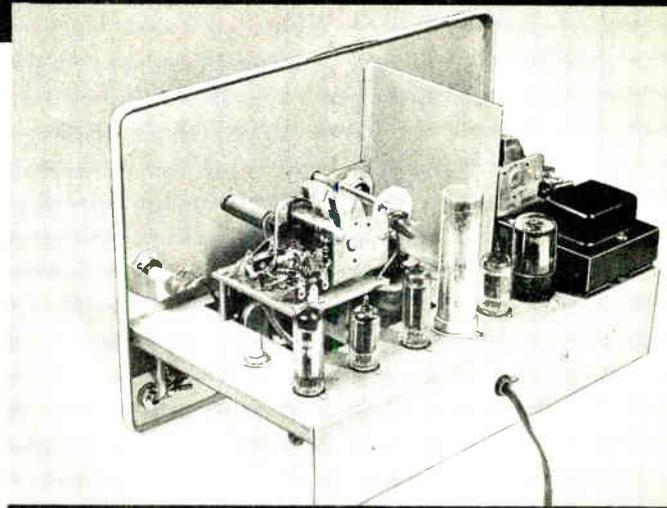
16 TV CHANNELS IDENTIFIED ON OSCILLATOR DIAL

# SWEEP GENERATOR KIT

ability a current-controlled inductance is obtained. Outstanding characteristics and advantages of Incredutor operation are; remote control of the unit, no moving parts, wide range, high sensitivity and fast response with sweep frequencies far beyond the range of mechanical systems. Another major kit construction advantage of the Incredutor is that all 4 oscillator coils are an integral part of the potted, prewound, pre-assembled Incredutor unit. No individual coil winding or tedious calibration necessary. Also, there is complete absence of vibration or noise so inherent in electro-mechanical systems.

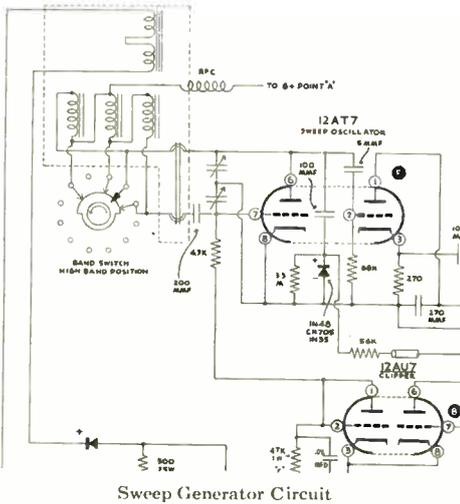
## OSCILLATOR

The oscillator circuit provides continuous frequency coverage from 4 mc to 220 mc in 4 ranges, including the FM spectrum. Maximum sweep deviation depending on initial frequency, up to 50 mc. Oscillator operation is entirely on fundamentals, thereby eliminating parasitics and spurious oscillation inherent in the usual beat frequency oscillator systems. This method of operation also produces a much higher output voltage and, in the case of the Heathkit Model TS-3, total output voltage is well in excess of .1 volt which is more than adequate for any alignment requirement. A twin triode 12AT7 tube is used in the oscillator circuit so arranged that the first triode is the oscillator itself which is coupled to the second triode which acts as a cathode follower buffer between the oscillator and the output terminals. This method completely eliminates frequency shift, instability and distortion usually caused by external circuit loading. Another major advantage of the Incredutor sweep oscillator circuit is that sweep action is in one direction only, resulting in simplification in obtaining complete response information. For example, to check an IF picture carrier of 25.75 mc the oscillator is set at 16 mc and increased in sweep width up to 30 mc so that the 14 mc sweep width will show response curve information such as adjacent channel pix trap at 19.75—sound trap at 21.25 mc—pix carrier at 25.75 mc—adjacent channel sound trap at 27.25 mc. This sweep pattern easily provides all of the essential information required by the service man during alignment work.



## FILTERING—SHIELDING

Major consideration has been given to the problem of RF radiation and all standard good construction and filtering techniques have been observed. The marker oscillator section is shielded, a two section filter network used in each leg of the AC supply line and the oscilloscope sync terminals have been properly RF decoupled. This technique has been further followed through unitized construction in respect to the marker, variable oscillator, automatic amplitude control circuit and power supply. Variable capacitor shafts have been isolated from the panel through the use of fiber shaft extensions. As an additional precaution, the chassis is copper plated and treated for tarnish proofing. Copper plating is extremely effective in reducing shielding problems peculiar to high frequency circuits. The complete instrument is housed in an attractive, newly styled, formed aluminum cabinet.

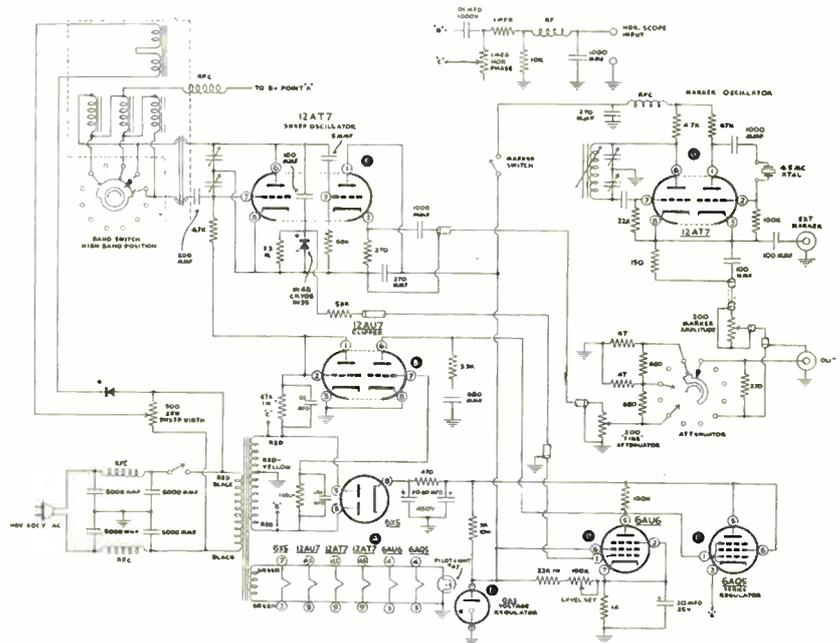


## ATTENUATION

The low impedance output circuit of the TS-3 utilizes a three step attenuator in connection with a "fine" attenuator control. This system assures ample control over the high output level of the instrument and more than adequate RF level operating reserve for normal operation.

## CABLES

All necessary connecting cables are supplied with this kit. The three cable set consists of low loss, low capacity, properly terminated shielded cables. The only additional equipment required for conventional alignment work is an oscilloscope such as any of the popular Heathkit model scopes.

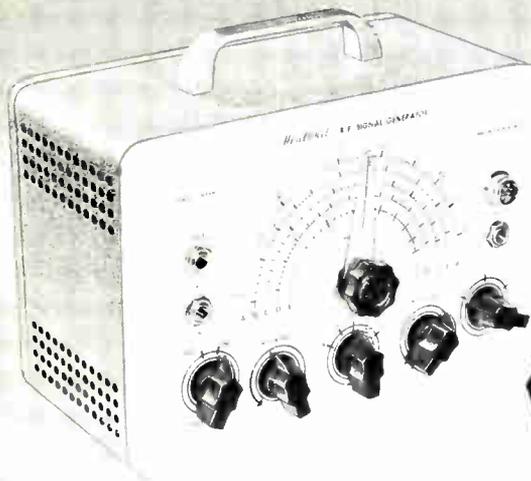


This schematic information is freely offered for your information even though advanced instrument design usually represents confidential, restricted information. Heath Company policy is to stimulate interest in design through free distribution of technical information.

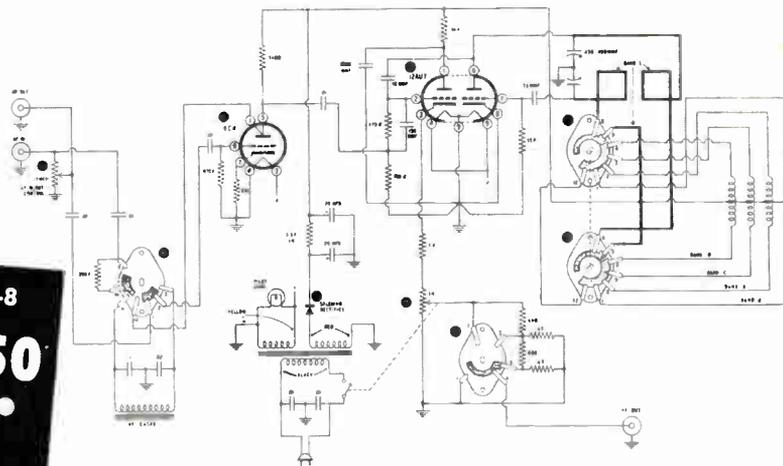
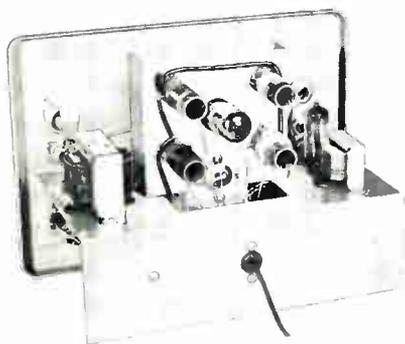
COVERS IF AND BROADCAST FM FREQUENCIES

Heathkit  
MODEL SG-8

# SIGNAL GENERATOR KIT



MODEL SG-8  
**\$19.50**  
SHIPPING  
WT. 8 LBS.



## FEATURES

- Extended fundamental range 160 kc to 110 mc
- Step attenuated variable RF output
- 6 to 1 vernier dial ratio
- Turret mounted coil sub-assembly
- Pre-calibrated and adjustable coils
- Colpitts oscillator 400 cycle sine wave output
- Modulated or unmodulated RF output
- Internal or external modulation

Announcing the new service type Signal Generator Model SG-8 incorporating many design features not usually found in an instrument in this price range. The RF output frequency coverage is from 160 kc to 110 mc in five ranges, all on fundamentals, with useful calibrated harmonics up to 220 mc. The RF output level is well in excess of 100,000 microvolts throughout the frequency range.

The oscillator circuit consists of a twin triode tube, one half used as a Colpitts oscillator and the other half as a cathode follower output which acts as a buffer between the oscillator and external load. This circuitry eliminates oscillator frequency shift usually caused by external circuit loading.

All coils are factory wound and adjusted thereby completely eliminating the need for individual calibration and the use of additional calibrating equipment. The stable, low impedance output features step and variable attenuation for complete control of RF level. A separate 6C4 triode acts as a 400 cycle sine wave oscillator, and a panel mounted switching system permits choice of either external or internal modulation.

The transformer operated circuit is easy to assemble, requires no calibration and meets every circuit requirement for an adjustable level, variable frequency signal source either modulated or unmodulated.

## REPLACEMENT PARTS

Another major advantage in buying kit form test equipment is that the kit builder can quickly repair his instrument because of thorough familiarity with the circuit and construction. Many of the kit replacement parts are standard universally available items. In event specialized kit parts are required, replacements can be quickly obtained from the Heath Company. An adequate stock of reserve material is maintained expressly for this purpose and customers' requests for replacement parts always receive prompt attention.

Contrast this method of instrument maintenance with the usual practice of returning the factory built instrument to the manufacturer for costly repairs and frequently a delay period of several weeks. Also, calibration accuracy checks can be periodically made with a kit instrument instead of assuming that "factory" calibration remains accurate indefinitely.

Therefore, benefits through the use of kit instruments are twofold: fast, easy maintenance, no costly factory repair service.

## SPECIFICATIONS

Frequency Range	
Band A	160 kc to 500 kc
Band B	500 kc to 1650 kc
Band C	1.65 mc to 6.5 mc
Band D	6.5 mc to 25 mc
Band E	25 mc to 110 mc
Calibrated Harmonics	110 mc to 220 mc
Radio Frequency Output	In excess of 100,000 microvolts
Modulation Frequency	Approximately 400 cycles
Audio Output	2 to 3 volts
Audio Frequency Output	Approximately 5 v across 1 megohm
Tubes	
12AU7	RF Oscillator-Buffer
6C4	Audio Oscillator or Audio Amplifier
Cabinet Size	9 1/2" wide x 6 1/2" high x 5" deep
Power Requirements	105-125V, 50/60 cycles

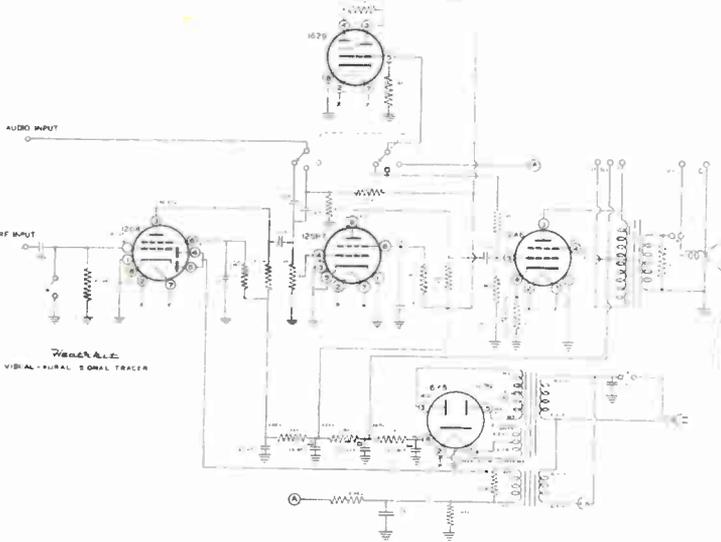
## APPLICATIONS

Radio service work . . . laboratory work . . . experimental testing  
. . . TV service applications . . . 400 cycle sine wave audio testing  
. . . checking RF stages . . . alignment of both AM and FM IF stages  
. . . marker generator for TV alignment, etc.

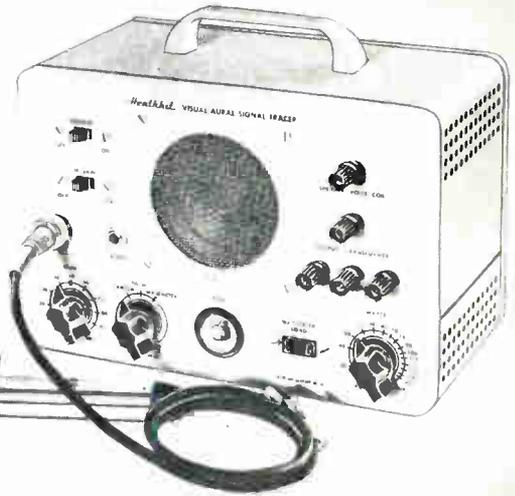
ALL HIGH QUALITY STANDARD BRAND COMPONENTS

Heathkit  
VISUAL-AURAL

# SIGNAL TRACER KIT



MODEL T-3  
**\$23<sup>50</sup>**  
SHIPPING  
WT. 10 LBS.

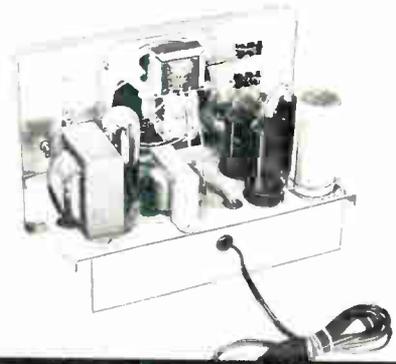


## FEATURES

- Visual and aural signal tracing
- Two channel input
- High RF sensitivity
- Unique noise locator circuit
- Calibrated wattmeter
- Substitution test speaker
- Utility amplifier
- RF audio probes and test leads included

An entirely new type of Signal Tracer incorporating a combination of features not found in any other service instrument. Designed expressly for the radio and TV service man and particularly for the servicing of AM, FM and TV circuits. This new Signal Tracer features a special high gain RF input channel used in conjunction with a newly designed wide frequency range demodulator probe. High RF sensitivity permits signal tracing from the receiver antenna input. Separate low gain channel and probe available for audio circuit exploration. Both input channels are constantly monitored by an electron ray beam indicator so that visual as well as aural indications may be obtained. A decidedly unusual feature is a noise locator circuit used in conjunction with the audio probe. With this system a DC potential is applied to a suspected circuit component and the action of the voltage in the component can be seen as well as heard; invaluable for ferreting out noisy or intermittent condensers, noisy resistors, controls, coils, IF power transformers, etc. Built-in calibrated wattmeter circuit will prove useful for quick preliminary check of the total wattage consumption. Separate panel terminals provide external use of the speaker or output transformer for substitution purposes. Saves valuable service time by eliminating the necessity for speaker removal on every service job.

Don't overlook the interesting service possibilities provided through the use of this new instrument and let it work for you by saving time and money.



## SPECIFICATIONS

### Probes and Test Leads

- Shielded RF probe and lead
- Audio probe and lead
- Two flexible panel test leads with alligator clips

### Tube Complement

- 12C8 Amplifier and wattmeter rectifier
- 12SH7 High gain pentode amplifier
- 12A6 Beam power output
- 1629 Electron beam visual indicator
- 6X5 Full-wave rectifier

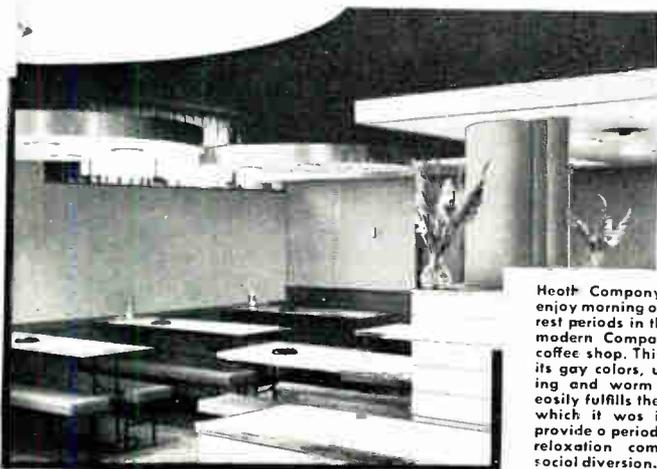
Cabinet size 9 1/2" wide, 6 1/2" high, 5" deep

Shipping weight 10 pounds

Power requirements 110 to 120 volts AC at 50-60 cycles

## APPLICATIONS

For signal tracing through all stages of a receiver circuit . . . can be used for AM, FM, and TV circuit work . . . tremendous gain permits direct observation of actual transmitted signal, no need to use a signal generator in conjunction with this signal tracer . . . audio circuit exploration . . . checking output transformer and speaker action . . . checking audio coupling and by-pass condensers . . . convenient wattmeter circuit permits quick preliminary measurements of actual power consumption for comparison against manufacturers rating on chassis label . . . can be used as a universal test speaker or substitution output transformer . . . record changer reproduction . . . microphone action . . . as booster or preamplifier for oscilloscope . . . output meter and many other useful shop applications.



Heath Company employees enjoy morning and afternoon rest periods in this strikingly modern Company operated coffee shop. This room, with its gay colors, unusual styling and warm atmosphere easily fulfills the purpose for which it was intended; to provide a period of complete relaxation combined with social diversion.

**BUILD YOUR OWN INSTRUMENTS—SAVE LABOR COSTS**



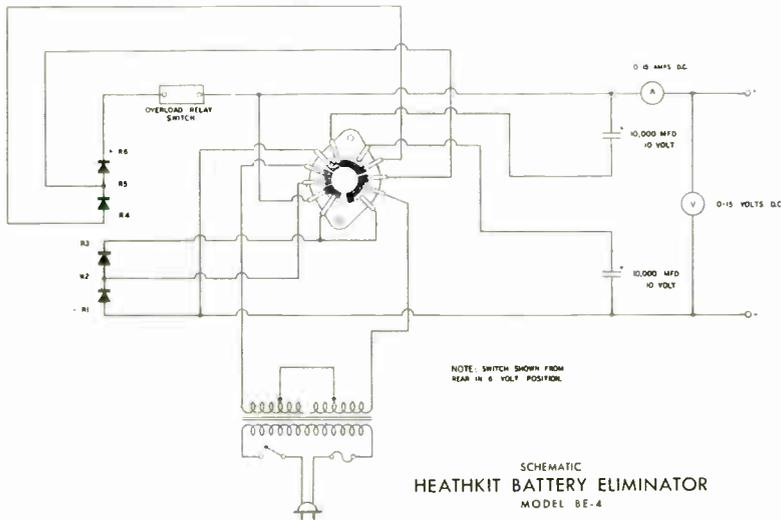
# NEW 12 VOLT *Heathkit* BATTERY ELIMINATOR KIT

## FEATURES

- Either 6 or 12 volt operation
- Continuously variable voltage output
- Constant ammeter and voltmeter monitoring
- Automatic overload relay—self-resetting
- Two 10,000 microfarad condensers
- Fuse protection
- Useful as battery charger
- New 18 plate split type heavy duty rectifier unit

Here is the new 12 volt Heathkit Battery Eliminator so necessary for modern up-to-date operation of your service shop. Furnishes either six or 12 volt output which can be selected at the flick of a panel switch. Use the BE-4 to service all of the new 12 volt car radios in addition to the conventional 6 volt models.

This new Battery Eliminator provides two continuously variable output voltage ranges: 0-8 volts DC at 10 amperes continuously or 15 amperes maximum intermittent, 0-16 volts DC at 5 amperes continuously or 7.5 amperes maximum intermittent. The output voltage is clean and well filtered as the circuit uses two 10,000 microfarad condensers. The continuously variable voltage output feature is of definite aid in determining the starting point of vibrators, the voltage operating range of oscillator circuits, etc. Panel mounted meters constantly monitor voltage and current output and will indicate the presence of a major circuit fault in the equipment under test. The power transformer winding is fuse protected and, for additional safety, an automatic relay of the self-resetting type is incorporated in the DC output circuit.



**MODEL BE-4**  
**\$31<sup>50</sup>**  
SHIPPING  
WT. 18 LBS.



## 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

## APPLICATIONS

Work bench voltage supply for powering car radios under repair—simulating various battery operating voltages for checking radios for intermittents and shorts . . . storage battery charger . . . DC substitution voltage . . . ideal DC supply for filament voltages in high gain audio circuit work.



**MODEL VT-1**  
**\$14<sup>50</sup>**

SHIPPING  
WEIGHT  
6 POUNDS

# *Heathkit* VIBRATOR TESTER KIT

Your repair time is valuable and the service use of the Heathkit Vibrator Tester will save many hours of work. This Tester will instantly tell you the condition of the Vibrator being checked and, in addition, the test is thorough and complete. Tests Vibrators for proper starting and the easy-to-read meter indicates the quality of output on a large BAD—GOOD scale. The Heathkit VT-1 Vibrator Tester checks both interrupter and self-rectifier types of Vibrators. Five different sockets for checking hundreds of Vibrator types.

This Vibrator Tester operates from any Battery Eliminator capable of delivering continuously variable voltage from 4 to 6 volts DC at 4 amperes. The Heathkit Model BE-4 Battery Eliminator is an ideal companion piece for this Tester and particularly recommended. Through the use of this equipment, faulty Vibrators can be quickly and definitely spotted, thereby releasing valuable service time for other repair work. The kit is supplied complete, can be quickly assembled and will provide many years of time-saving service in your shop.

**SPEED UP YOUR CAR RADIO SERVICE WORK**

# The NEW IMPROVED Heathkit



## FEATURES

- Pre-wound coil kit and rack
- Continuous frequency coverage from 2 mc to 250 mc
- Compact, one-hand simplified operation
- Variable meter sensitivity control
- Simpson 500 microamp meter
- Headphone monitoring jack
- Pre-calibrated dial scale
- Improved power supply filtering

**MODEL GD-1B**  
**\$19.50**  
SHIPPING  
WT. 4 LBS.

Because of continuing insistent customer demand for a good, low priced grid dip meter, the Heath Company introduced its now famous Heathkit Grid Dip Meter in September of 1952. Customer response to this new instrument release was tremendous and in a few months the Heathkit Grid Dip Meter became the outstanding sales leader in its field.

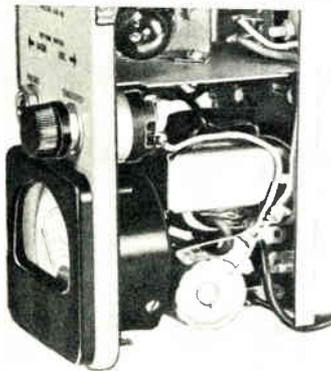
This is the instrument with many applications for amateur radio operators, service men, laboratory technicians, students, and experimenters. Instrument operation is based on sensitive meter measurement of grid current in a variable oscillator circuit. When the grid dip meter is coupled to a resonant circuit, a pronounced dip of the meter pointer will occur as the oscillator is tuned through the resonant frequency of the circuit under investigation, hence the "grid dip." In addition to this basic application of the instrument, there are many other uses which greatly increase overall instrument operating usefulness.

## NEW FEATURES

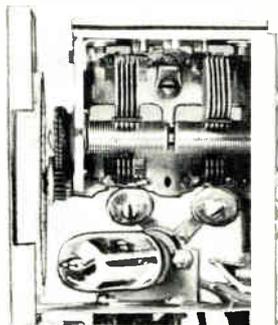
From the vast experience gained in producing over 15,000 Heathkit Grid Dip Meters, many new circuit refinements have been added to the instrument design. In this new model, GD-1B, greater instrument operating sensitivity has been obtained through circuit refinements. Sensitivity increase is reflected both in higher RF output level and increased sensitivity when the instrument is operated as a diode detector. Filtering has been further improved through the use of a two-section RC filter network resulting in lower hum level and cleaner tone with headphone operation. A three pin plug-in coil socket is now used to simplify circuit use of the two low frequency coils. (341-A) The third pin provides the necessary ground connection for the Hartley oscillator and eliminates the separate ground clip formerly used. A transparent plastic window with a printed reference hairline is now used in the panel dial opening for easier reading of calibrations.

## FUNCTIONS

Originally the grid dip meter found its greatest application in the amateur radio field where it was used to provide a relative indication of power in transmitter stages, for checking neutralization, for locating parasitics and spurious radiation, correcting TVI, measuring C, L, and Q of components, and determining RF circuit resonant frequencies. Now the grid dip meter is finding wide application in TV servicing for the alignment of traps, filters, IF stages, peaking and compensation networks, etc. With the oscillator not energized, the instrument acts as an absorption wave meter and indicates the frequency of radiating sources (500 microvolts required for full scale meter deflection). Plugging headphones into the panel jack further extends the instrument's usefulness through operation as an oscillating detector for determining the frequency of other oscillator circuits through zero beating.



The power supply system is transformer operated for line isolation and features a selenium rectifier and dual 20 MFD filter condenser for lower hum level.



Oscillator circuit design is clean, open and straight forward with a logical arrangement of components to eliminate possibility of constructional error.

## SPECIFICATIONS

<b>Frequency Range</b> .....	2—250 mc using plug in coils supplied with kit (350 kc—20 kc with additional coil set)
<b>Meter Movement</b> .....	Simpson 500 microampere
<b>Circuit</b> .....	6AF4 or 6T4 high frequency triode in a Colpitts oscillator circuit
<b>Power Supply</b> .....	Transformer operated with selenium rectifier
<b>Physical Specifications</b> .....	Length 7" Width 2½" Depth 3¼"
<b>Power Requirements</b> .....	117 volts 50/60 cycles at 5 watts

**PRE-WOUND COILS—PRE-CALIBRATED DIAL SCALE**

# GRID DIP METER KIT

## CONSTRUCTION — DESIGN

Careful consideration has been given to the design of the Grid Dip Meter. This attention is reflected in the one-hand operation permitting the grid dipper to be tuned and held in one hand and leaving the other hand entirely free for making circuit adjustments. A variable meter 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. Through the use of the accessory 341-A Coil Kit, frequency coverage can be further extended down to 350 kc. Dial calibrations are easily read and a convenient logging scale is provided. Spare blank dial scales have been supplied for the kit builder who wishes to hand calibrate his particular instrument or desires maximum accuracy at specific frequencies.

A built-in power supply is transformer operated providing the necessary margin of safety through line isolation. Even though the instrument is compact, its efficient kit design permits easy assembly.

## COMPONENTS

As with all Heathkits, the components of the GD-1B Grid Dip Meter are all of the highest quality. The meter is a Simpson 500 microampere movement. The split-stator variable condenser is gear driven and spring loaded to eliminate backlash. All standard brand selenium rectifier, filter condenser, power transformer, resistors, condensers, etc. Specially selected high frequency socket for the 6AF4 or 6T4 high frequency triode. The entire instrument is housed in a formed aluminum cabinet of attractive appearance and pleasing proportions. Infra-red baking of the panel assures a tough, durable, long wearing surface. Truly this instrument represents one of the most worthwhile additions to any ham shack, laboratory or service shop.

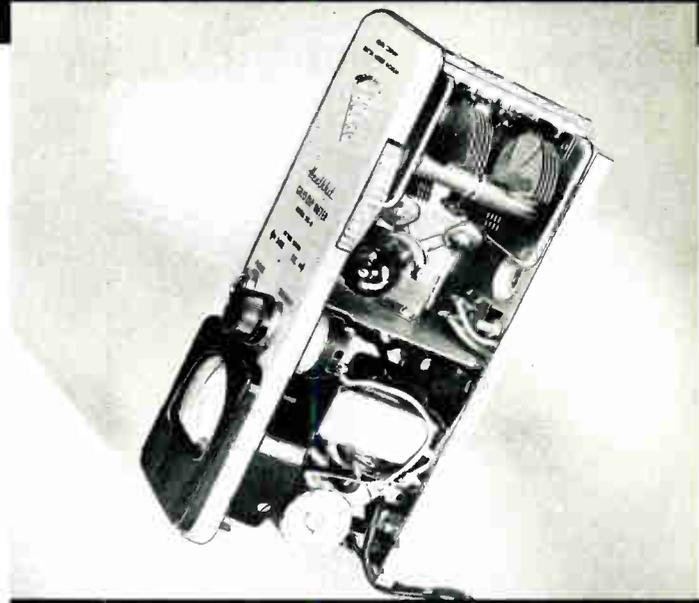
## ADDITIONAL PLUG IN COILS

A set of two additional plug in coils is available for the GD-1B. This set is the three prong mounting type and provides continuous extension of low frequency coverage down to 355 kc. Dial correlation curves included. Shipping wt. 1 lb. No. 341-A.

**\$3.00**

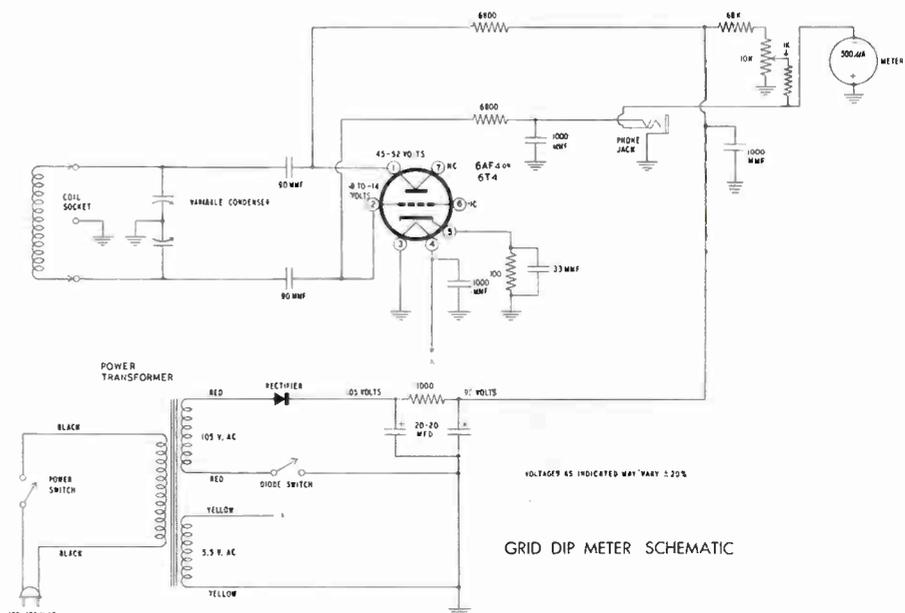


A similar set of additional plug in coils is also available for earlier Heathkit Models GD-1 and GD-1A. These are two prong mounting type with an external pigtail ground connection. Frequency coverage is also extended down to 355 kc. and dial correlation curves are included. Shipping wt. 1 lb. Kit 341 for Models GD-1 and GD-1A only. **\$3.00**



## APPLICATIONS

Use it to indicate frequency of both energized and de-energized circuits within the frequency range of the instrument. Useful in TV servicework for alignment of traps, filters, IF stages, peaking and compensation networks . . . indispensable in amateur radio activity . . . locates spurious oscillation . . . provides a relative indication of power in transmitter stages . . . etc. . . . phone jack permits monitoring of AM transmitter for determination of radiated hum, audio quality, etc.



This schematic clearly illustrates the fundamental basic simplicity of the Heathkit GD-1B. No trick circuits or special calibration required in order to obtain specified performance level.

# IMPROVED *Heathkit* "Q" METER KIT

## FEATURES

- First popular priced Q Meter
- Reads Q directly on calibrated scale
- Oscillator supplies RF frequencies of 150 kc to 18 mc
- Calibrate capacitor with range of 40 MMF to 450 MMF with vernier of  $\pm 3$  MMF
- Measures Q of condensers. RF resistance and distributed capacity of coils
- Simplified, rapid operation—convenient slanted panel
- VTVM circuit with Simpson 50 microampere  $4\frac{1}{2}$ " meter
- Built-in power supply featuring voltage regulation

Another outstanding example of successful Heathkit engineering effort in producing a Q Meter kit within the price range of schools, laboratories, TV service men and experimenters. The Heathkit Q Meter will enable the technician to simulate conditions encountered in practical circuits and measure the performance of a coil or condenser. Such measurements are all made at the operating frequency actually encountered in the circuit. All indications of value can be read directly on the large  $4\frac{1}{2}$ " 50 microampere Simpson calibrated meter scale. Oscillator section supplies RF frequencies of 150 kc to 18 mc in 4 ranges. Calibrate capacitor with

range of 40 MMF to 450 MMF with vernier of  $\pm 3$  MMF. Particularly useful in TV service work for checking peaking coils, wave traps, chokes, etc. At this low kit price, research laboratory facilities are within the range of service shops, schools and experimenters.

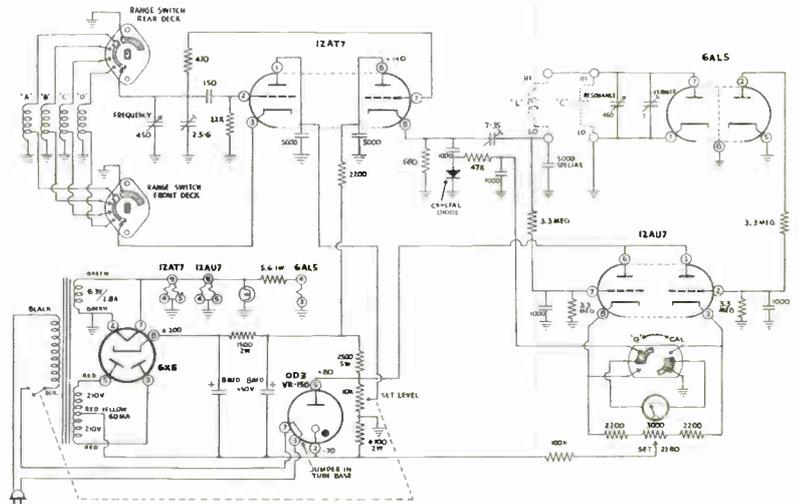
MODEL QM-1

**\$44.50**

SHIPPING  
WT. 14 LBS.

## SPECIFICATIONS

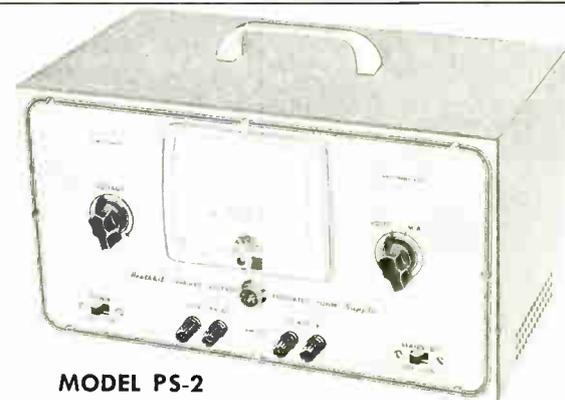
**Frequency Range:** 150 KC—18 MC  
**Inductance Scale Range:** 1 micro H.—10 milli H.  
**Actual Capacity Scale Range:** 40 MMF—450 MMF  
**Effective Capacity Scale Range:** 40 MMF—400 MMF  
**Vernier Capacity Scale Range:** —3 MMF — + 3 MMF  
**"Q" Scale Range:** 250 Full Scale  $\times 1$  or  $\times 2$   
**Tube Complement:** 1—12 A17 Oscillator  
 1—6A5 VTVM diode  
 1—12AU7 VTVM amplifier  
 1—OD3/VR150 Regulator  
 1—6X5 Rectifier  
**Dimensions:** 8" high x 17" wide x 6" deep  
**Power Requirements:** 115 volts AC 50/60 cycles 30 watts



## *Heathkit* LABORATORY REGULATED POWER SUPPLY KIT

Here is a new Heathkit Laboratory Power Supply with many outstanding features that thoroughly qualify it for laboratory and service shop application. The regulated voltage output is continuously variable and constant under wide load variations. A  $4\frac{1}{2}$ " Simpson plastic cased panel mounted meter constantly monitors the laboratory power supply output for either voltage or current measurements. Linear, variable DC output voltage with excellent regulation is readily available. Panel terminals provide a separate 6.3 volt AC supply of 4 amperes for necessary filament voltage requirements. The DC voltage output is completely isolated from the chassis and therefore can be conveniently used for AC-DC circuit work. Ripple component is exceptionally low; .03 volt ripple at 250 volts under 50 milliampere load conditions for a percentage of .012%.

These highly desirable features admirably qualify the Heathkit Laboratory Power Supply for experimental high gain audio applications—as a spare source of DC supply for service work—laboratory experimental work—plotting tube characteristics, etc.



MODEL PS-2

**\$33.50**

SHIPPING WEIGHT  
20 LBS.

# NEW *Heathkit* LABORATORY TYPE SIGNAL GENERATOR KIT

## FEATURES

- Panel meter calibrated in output voltage and per cent modulation.
- Output impedance termination 50 ohms.
- Double shielding of oscillator circuits.
- Voltage regulated B+ supply—transformer operated.
- Operation on fundamentals 150 kc to 30 mc in five ranges.
- Output voltage .1 volt — provisions for metered external or internal modulation.
- Useful in design work involving gain, selectivity, band width, etc.
- The ideal Signal Generator for radio and TV service work.

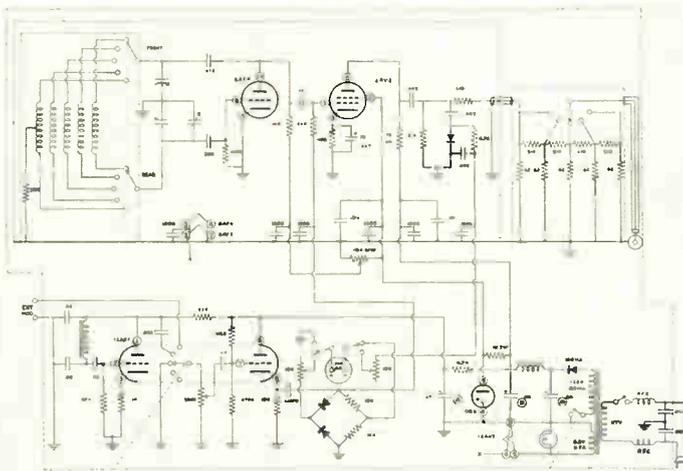
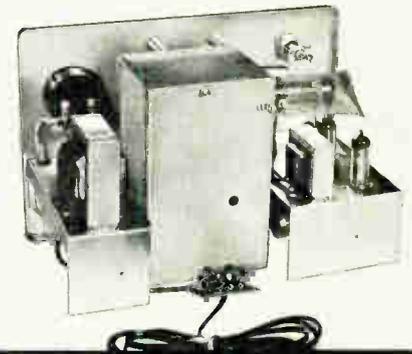
The new Heathkit laboratory type Signal Generator definitely establishes a new standard of performance for a kit instrument.

A particularly outstanding feature involves the use of a panel mounted 200 microampere meter calibrated both in microvolts and per cent modulation, thereby providing a definite reference level when using the Signal Generator in design work, gain measurements, selectivity and frequency response checks, etc. Obviously the instrument will have many applications in radio and TV service work through its ability to establish a known signal reference level prior to checking individual RF, IF stages for gain and operating characteristics.

Additional design features are separate copper plated shield enclosure for oscillator and buffer stages resulting in effective double shielding of the instrument, fiber panel control shaft extensions in RF carrying circuits and thorough AC line filtering. The attenuator network and the terminated, low loss, 50 ohm impedance output cable have also been carefully shielded. Provisions for metered internal and external modulation—voltage regulated B+ supply—selenium rectifier, etc.

Investigate the many dollar stretching features offered by the Heathkit LG-1 before investing in any generator for laboratory or service work.

MODEL LG-1  
**\$39.50**  
 SHIPPING  
 WT. 16 LBS.



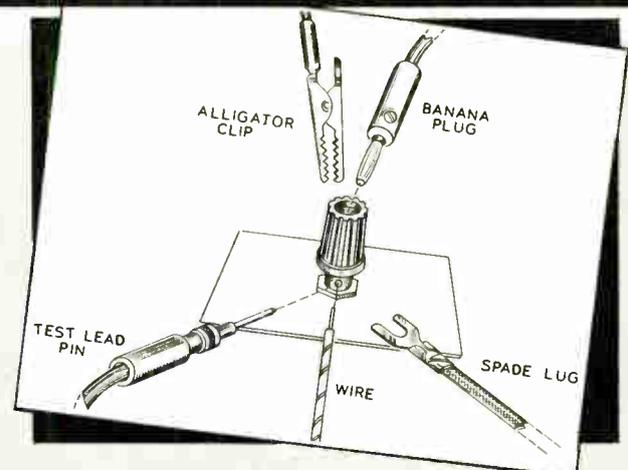
## SPECIFICATIONS

- Frequency range in 5 bands ..... 150 kc to 30 mc
- Output voltage ranges ..... 100,000  $\mu$ V-1  $\mu$ V
- Modulation range ..... 0-50%
- Modulation frequency (internal) ..... 400 cycles approximately
- Modulation frequency (external) ..... 60 to 10,000 cycles
- Oscillator circuit ..... Colpitts with 6AF4 tube
- Amplifier circuit ..... grid modulated using 6AV5 tube
- Modulator circuit ..... Colpitts AF oscillator and cathode follower using 12AU7 tube
- RF metering circuit ..... Single crystal diode
- AF metering circuit ..... Two crystal diodes in half bridge
- Output circuit ..... 50 ohm network
- Power requirements ..... 105-125 volts 50/60 cycles

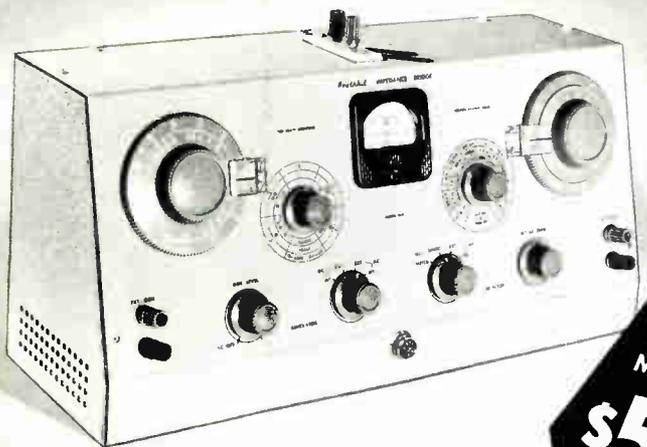
## *Heathkit* BINDING POST

After carefully investigating requirements for a binding post which would accommodate a wide variety of test lead terminals, the Heath Company decided to design its own panel connector. The sketch clearly shows the universal manner in which the new binding post will easily accommodate an alligator clip, banana plug, test lead pin, spade lug or wire. The plastic insulator cap is fluted so that it can easily be tightened to the binding post base.

To accommodate customer requests, a binding post kit is now available for the standardization of all instrument panel connectors. The kit is sold only in units of twenty complete binding post assemblies; ten red and ten black insulator caps. Each assembly consists of binding post base, fluted cap, flat fiber washer, shoulder fiber washer, solder lug and 6-32 nut; 120 pieces in all. Shipping weight 1 pound. Binding Post kit 362-A at \$4.00.



# The NEW MODEL IB-2 Heathkit



**MODEL IB-2**  
**\$59.50**  
SHIPPING  
WT. 15 LBS.

## FEATURES

- Completely AC operated
- Built-in phase shift generator and amplifier
- Battery type tubes, no warm up required
- Newly designed two section CRL dial
- Single knob D, Q, and DQ functions
- Special impedance matching transformer
- Simpson 100-0-100 microampere meter
- 1/2% precision resistors and silver mica condensers

Another new outstanding instrument design so typically characteristic of Heathkit operation in producing high quality instrument kits at lowest possible price levels. Here is a new model improved Impedance Bridge featuring modern cabinet styling with slanted panel for convenience of operation and interpretation of scales at a \$10.00 price reduction over the preceding model. This new instrument features a host of outstanding improvements and is ideally suited for laboratory use in educational or industrial applications. The entire unit is self-contained and designed for rapid, accurate measurement of resistance, capacitance, inductance, dissipation factors of capacitors and the storage

factors of inductance. The Heathkit Model IB-2 Impedance Bridge kit actually represents four instruments in one unit. The Wheatstone bridge for resistance measurements, the Capacity Comparison bridge for capacity measurements, Maxwell bridge for low Q and Hay bridge for high Q measurements.

## PANEL CONTROLS

The entire instrument is self-contained and housed in a sturdy aluminum cabinet. Panel controls are separated as to their function and clearly identified. A newly designed two section CRL dial provides 10 separate "units" switch settings with an accuracy of .5%. Fractions of units are read on a continuously variable calibrated wire wound control. This method provides convenience of operation never before attained in a low price kit instrument. D, Q and DQ functions are all combined in one control with single knob operation, thereby eliminating possible confusion or the incorrect dial reference or adjustment. Only one set of instrument terminals required for all measurements. Convenient alligator clips mounted on banana plugs can be plugged into the 5 way type instrument terminals. Clip type mounting eliminates inaccuracies due to contact resistance on low value measurements. Separate panel terminals permit use of external generator or detector when desired.

## PHASE SHIFT GENERATOR

An outstanding design feature is represented through the use of an adjustable phase shift generator as a 1000 cycle reference for measurement work instead of the microphone hummer previously used. The phase shift generator provides a higher degree of accuracy and better wave form output. For instantaneous operation and to eliminate frequency shift due to temperature increase, battery type tubes are used in this instrument. No delay while waiting for the instrument to warm up or stabilize. Detector and amplifier stages also are built in and utilize quick heating battery type tubes.

A special minimum capacity, shielded, balanced, impedance matching transformer couples the generator to the bridge circuit. The correct impedance match is automatically switch-selected to provide constant load operation of the generator circuit. Just another example of the careful attention paid to details of operation so important to improved instrument performance.

## COMPONENTS

Careful consideration has been given to the selection of components in the Heathkit Model IB-2 Impedance Bridge. In circuits where accuracy is of prime importance, 1/2% deposited carbon type pre-



NEW Two section CRL Dial showing "units" decade and variable control.

NEW D, Q, and DQ multiple control with single knob operation and calibration.

## SPECIFICATIONS

Circuit	4-arm impedance bridge
DC Measurements	Built-in power supply operating directly from 110 V AC. Panel binding posts provide for use of external supply.
Meter	100-0-100 microampere meter
AC Measurements	Built-in 1000 cycle vacuum tube oscillator. Terminals on panel provide for connecting an 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	10 mmf to 100 mfd
Inductance	10 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. 1/2 of 1% silver mica condensers used. Accuracy is limited more by interpretation of scales and workmanship of assembly. The following is normal: Resistance ± 3% Capacitance ± 3% Inductance ± 10% Dissipation Factor (D = wCR) ± 20% Storage Factor (Q = wL/R) ± 20% Accuracy will fall off at extreme outer limit
Tube Complement	2—11U4 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

# IMPEDANCE BRIDGE KIT

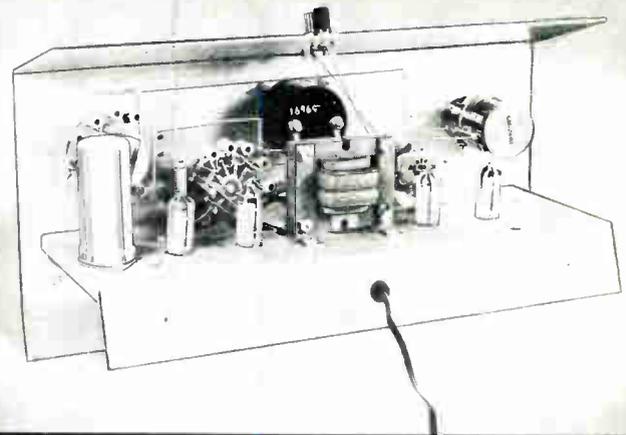
recision resistors are used. The same careful consideration has been given to the selection of precision condensers and here again  $\frac{1}{2}\%$  silver mica precision condensers were specially selected for this purpose. A panel mounted Simpson 100-0-100 microammeter provides null indications. Meter sensitivity and built-in amplifier eliminates need for headphones. Null indications can be observed directly from meter action. Wire wound controls, switches, transformers, etc., all have been manufactured to Heath Company specifications for this bridge instrument. In critical circuits, heavy solid wire is used instead of conventional hookup wire to eliminate external capacity effects due to improper wiring dress. All components are of laboratory quality for use in this precision instrument.

## POWER SUPPLY

The Heathkit new Model Impedance Bridge is entirely AC operated thereby eliminating all of the disadvantages inherent with the use of dry cell batteries. The power transformer selenium rectifier operated supply system fulfills four basic functions of the instrument. Operating B+ to the generator and the amplifier stages, full wave selenium rectification of the DC filament supply, high DC voltage for the bridge circuit and a separate low voltage bridge supply. Power supply filtering has been given careful consideration and high capacity filter condensers are used.

(dual 1000 microfarad unit and single 1000 microfarad unit)

The single low price includes the power supply, generator and amplifier stages. No need to purchase separate instrument accessories in order to obtain the type of operation desired.



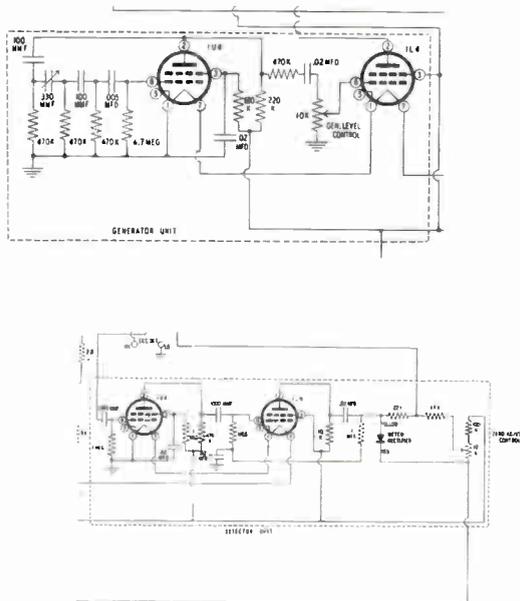
## APPLICATIONS

Designed for accurate measurement of resistance (R), capacitance (C), inductance (L), dissipation factor of capacitors (D) and the storage factor of inductors (Q).

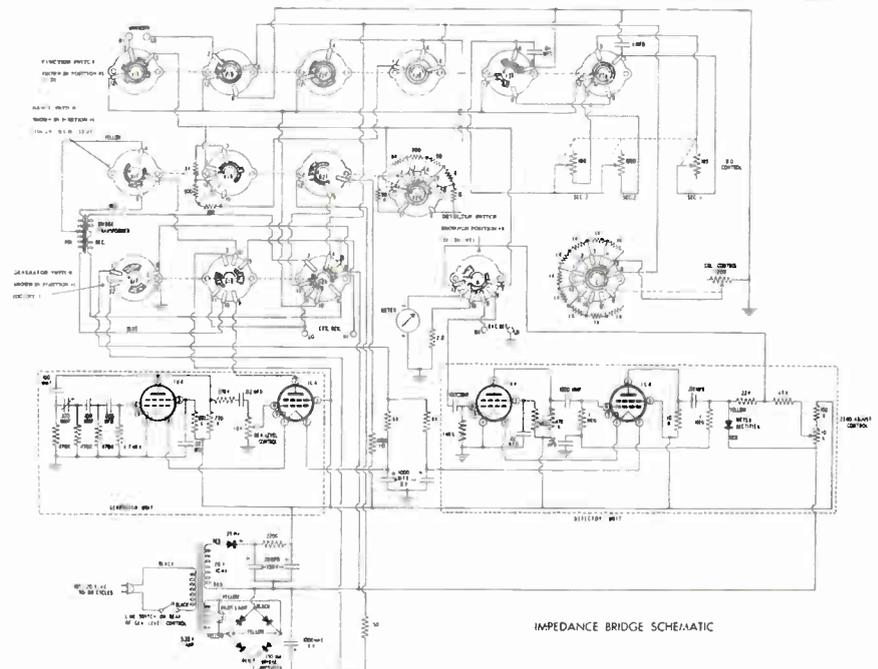
Use it for measuring AC and DC resistance values, determination of condenser capacitance and dissipation factor—finding coil inductance and storage factor—electrical measurements work—determining value of unmarked components—checking production or design samples, etc. Ideally suited for industrial or educational laboratory and overall performance level can be further extended in special design application. External generator permits AC measurements at other than 1 kc—natural frequency measurements with the use of a beat frequency oscillator—parallel inductance and resistance measurements through use of external resistors—parallel capacitance and resistance measurements through the use of external capacity and resistance standards, etc.

Well equipped TV service shops will find applications for precise, rapid, accurate measurement of critical resistors, capacity values, inductance, Q, etc.

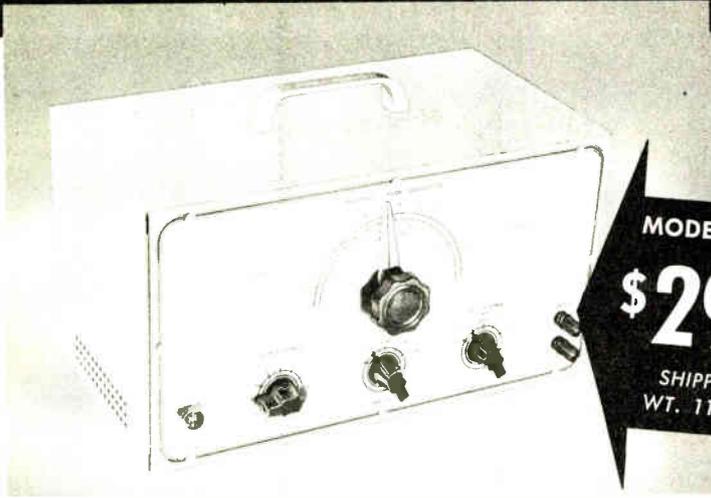
Partial schematic showing built in adjustable phase shift generator and amplifier stage.



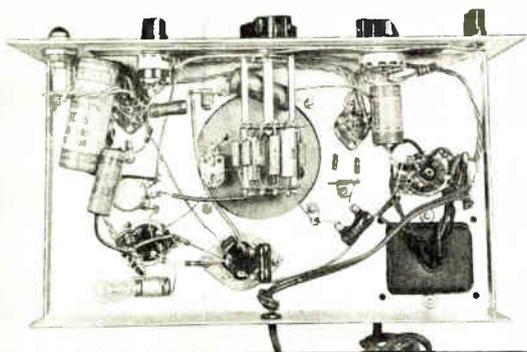
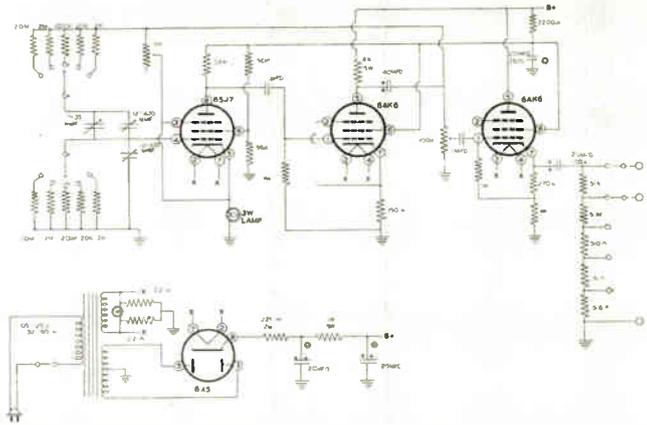
Partial schematic showing built in detector and amplifier stage.



# Heathkit AUDIO GENERATOR KIT



**MODEL AG-8**  
**\$29.50**  
 SHIPPING  
 WT. 11 LBS.



## FEATURES

- Improved design
- Continuous frequency coverage 18 cycles to 1.0 MC.
- New low price
- Response flat  $\pm 1$  db from 20 cycles to 400 KC.
- Five calibrated, continuously variable output ranges.
- Low impedance 600 ohm output circuit
- Distortion less than .4 of 1% from 100 cps through audible range.

Here is an Audio Generator with features generally found only in the most expensive instruments. Such features as complete sine wave coverage from 20 cycles to 1 megacycle—response flat  $\pm 1$  db from 20 cycles to 400 kc—continuously variable and step attenuated output controls—constant output voltage, etc.

Primary application of the Heathkit AG-8 would be investigation and development of audio circuitry. With the recent interest in wide band amplifier characteristics, the AG-8 fills a serious gap in that it makes available known audio voltages over an extremely wide range of both frequency and amplitude.

Because the output voltage is relatively constant over wide frequency ranges, the AG-8 is ideal for running frequency response curves in audio circuits. Once set by means of the attenuator, this voltage may be relied on for accuracy within  $\pm 1$  db.

An unbeatable dollar value, here is an excellent audio generator with wide frequency coverage and excellent frequency response, step and continuously variable calibrated output, high signal level, low impedance output and low inherent distortion.

## SPECIFICATIONS

Frequency Range	20 cps to 1 mc in five ranges
Output Voltage	10 volts (no load) $\pm 1$ db 20 cps to 400 kc; down 3 db at 600 kc; down 8 db at 1 mc
Generator Impedance	600 ohms
Distortion	less than 0.4%, 100 cps through audible range
Dimensions	7½" high, 13¼" wide, 7½" deep
Shipping Weight	11 lbs.
Power Requirements	30 watts, 105-125 volts, 50-60 cycles AC

## APPLICATIONS

Use it for an Audio Frequency source . . . Audio circuit study . . . loud-speaker response testing . . . audio amplifier design . . . AC bridge external generator . . . audio filter and network study . . . etc.

## Heathkit DECADE RESISTANCE KIT



**MODEL DR-1**  
**\$19.50**  
 SHIPPING  
 WT. 4 LBS.

The Heathkit Decade Resistance kit is widely used by schools, experimenters and laboratories because of the extremely wide resistance range covered, the rugged dependable service, and the high degree of accuracy provided. Applications for a Decade Resistance are numerous and to outline a few—as a known in bridge circuits for ohmmeter calibration—in the selection of proper meter multipliers—for experimentally determining resistance values in radio circuits—general laboratory work or any similar application requiring detailed selection of accurate resistance values within close limits of tolerance. Twenty 1% precision resistors are arranged in the circuit in a manner which will provide a resistance choice of 1 to 99,999 ohms in 1 ohm steps. The entire Decade Resistance kit is simple to construct and is housed in a beautifully polished birch cabinet with attractive panel.

## Heathkit DECADE CONDENSER KIT

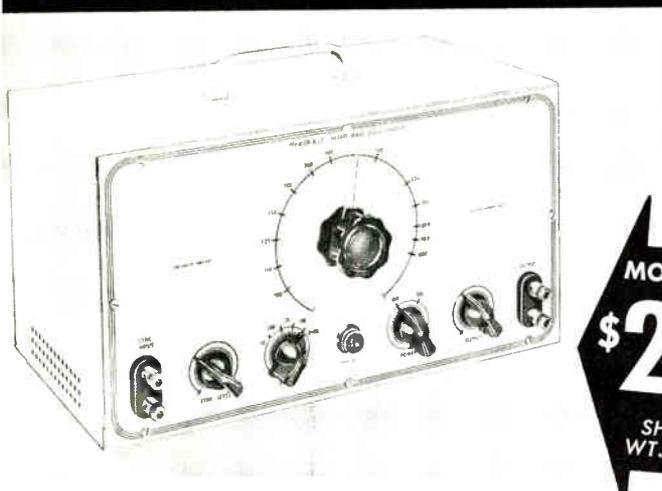


**MODEL DC-1**  
**\$16.50**  
 SHIPPING  
 WT. 4 LBS.

The Decade Condenser Kit will readily prove its merit in any design work requiring the determination of condenser values for compensating networks, filters, bridge impedances, tuned circuits, etc. It is ideally suited for use in technical school laboratories, industrial laboratories and any general design or development work. The condensers used in this Decade are precision silver mica type with a rated accuracy of  $\pm 1\%$ . Values are arranged in three decades from 100 MMF to 0.111 MFD in steps of 100 MMF. Smooth acting, positive detent, high quality ceramic wafer switches make all capacity values easy to set up and keep losses to an absolute minimum. Investigate the many interesting design possibilities offered by this low cost, high quality kit.



# Heathkit SQUARE WAVE GENERATOR KIT



**MODEL SQ-1**  
**\$29.50**  
 SHIPPING WT. 12 LBS.

The Heathkit Square Wave Generator will find many applications in circuit design, TV service work and audio engineering through its wide frequency range, good square wave output and high output voltage.

Square wave testing is used to study amplifier distortion, high and low frequency response, identify phase shift (especially important in video and oscilloscope amplifier design), show overshoot and damped oscillations and aid in selection of proper circuit values.

This instrument has all of the necessary design advantages you want—continuously variable output 10 cycles to 100 kc—high variable output voltage 0-20 volts—low impedance output.

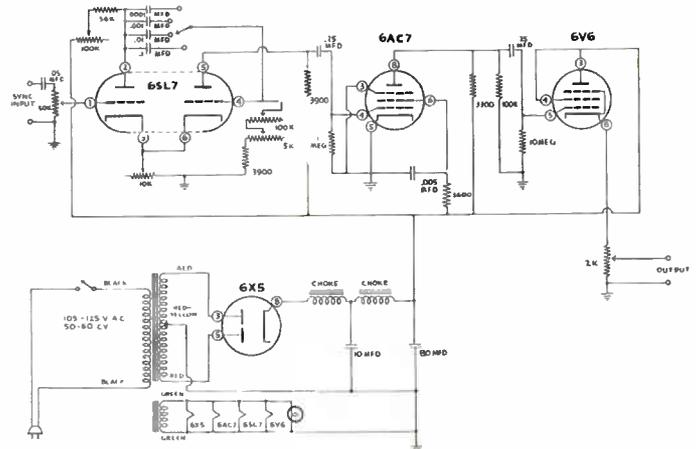
This Square Wave Generator has many applications and advantages in circuit development work. Don't be without the services of this extremely useful instrument.

## SPECIFICATIONS

<b>Ranges</b> .....	100, 1000, 10 KC, 100 KC
<b>Tube Complement</b> .....	1-6SL7, 1-6AC7, 1-6V6, 1-6X5
<b>Physical Specifications</b> .....	12 1/2" long, 7" high, 7 1/2" deep
<b>Shipping Weight</b> .....	12 lbs.
<b>Net Weight</b> .....	11 lbs.
<b>Power Requirements</b> .....	105-125 V AC, 50/60 cycle, 10 watts

## APPLICATIONS

A good source of Square wave output from 20 cps to 100 KC for square wave testing of Amplifiers ... electrical components network ... to study phase shift ... distortion ... high and low frequency response ... etc.



# Heathkit AUDIO FREQUENCY METER KIT

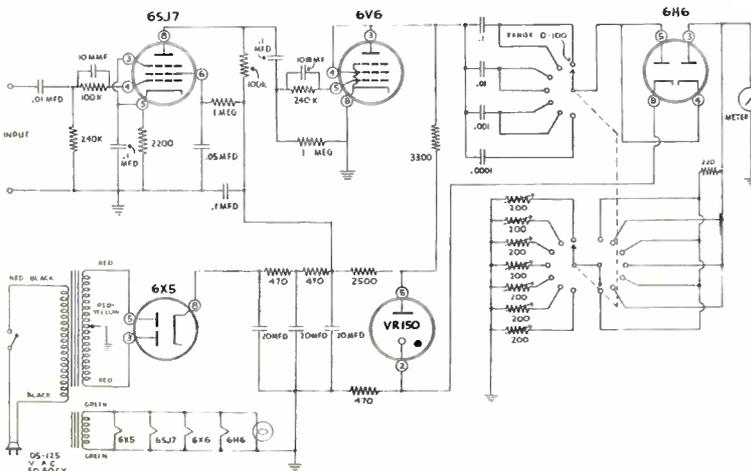
- Simplified operation
- Direct reading calibrations
- 10 cycles to 100 KC in seven convenient ranges

- Input wave shape not critical, any voltage between 3-300 volts RMS
- 4 1/2" Simpson meter
- Transformer operated

The Heathkit Audio Frequency Meter provides a simple and convenient means of checking unknown audio frequencies from 10 cycles to 100 kc at any input voltage level between 3 and 300 volts RMS. The instrument features seven switch selected ranges for convenience of operation. Accurate readings are easily taken from the clearly marked scales of the Simpson 4 1/2" 200 microampere meter movement.

Instrument operation is entirely electronic and there are no vibrating reeds or rotating discs. It is merely necessary to set the range switch for the most convenient reading, feed an unknown frequency into the instrument and read the frequency directly on the meter. The input wave shape supplied to the instrument is not critical and further extends the instrument usefulness. The Audio Frequency Meter is transformer operated and features voltage regulation. This kit is supplied complete with all tubes and necessary components in addition to a detailed construction manual.

**MODEL AF-1**  
**\$34.50**  
 SHIPPING WT. 12 LBS.



## SPECIFICATIONS

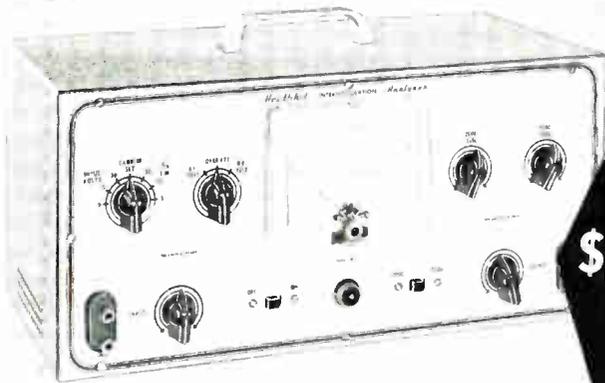
<b>Tube Complement</b> .....	1-6V6, 1-6H6, 1-6X5, 1-6SL7, 1-VR150
<b>Ranges</b> .....	0-100, 0-300, 0-1Kc, 0-3Kc, 0-10Kc, 0-30Kc, 0-100Kc
<b>Input</b> .....	Impedance 250,000 Ohms at 1,000 CPS Voltage 3-300 Volts RMS
<b>Physical Specifications</b> .....	12 1/2" long x 7" high x 7 1/2" deep
<b>Power Requirements</b> .....	105-125 V AC 50-60 cycles, 35 Watts

## APPLICATIONS

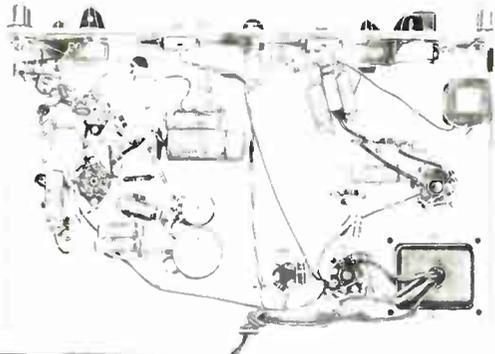
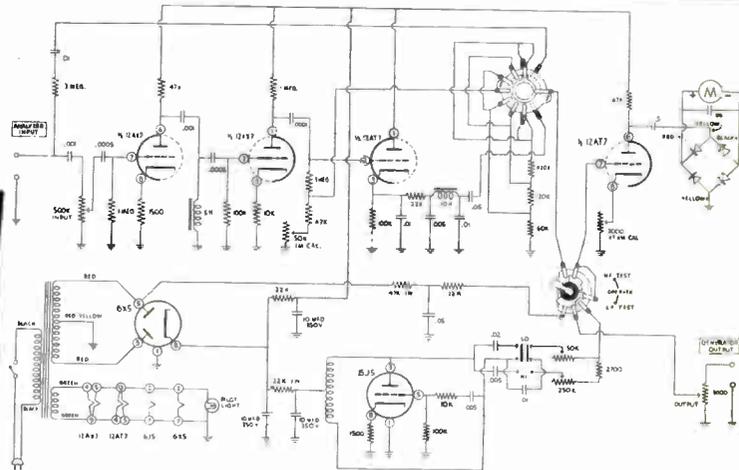
Use it for Production line testing involving frequency checking ... reading frequency output of various laboratory generators ... directly indicating square wave frequency ...

Heathkit

# INTERMODULATION ANALYZER KIT



**MODEL IM-1**  
**\$39.50**  
 SHIPPING  
 WT. 17 LBS.



## FEATURES

- First popular priced Intermodulation Analyzer
- Self contained high frequency generators
- Direct reading IM percentage
- Simplified operation—three calibrated scales
- Quick linearity check—checks individual stages
- 4½" Simpson meter—transformer operated

The Heathkit Model IM-1 Intermodulation Analyzer is an extremely versatile instrument specifically designed for measuring the degree of interaction between two signals in any portion of an audio chain. While it is primarily intended for quick performance tests of audio amplifiers, it also may be used in other applications such as checking microphones, records, tapes, recording equipment, phonograph pickups and loudspeakers.

The Heathkit Model IM-1 is a complete unit designed for this purpose incorporating both a high and low test frequency source, intermodulation unit, power supply and AC vacuum tube voltmeter all in one compact instrument. Per cent intermodulation is directly read on the calibrated scales 30%, 10% and 3% full scale. Both 4:1 and 1:1 ratios of low to high frequency easily set up.

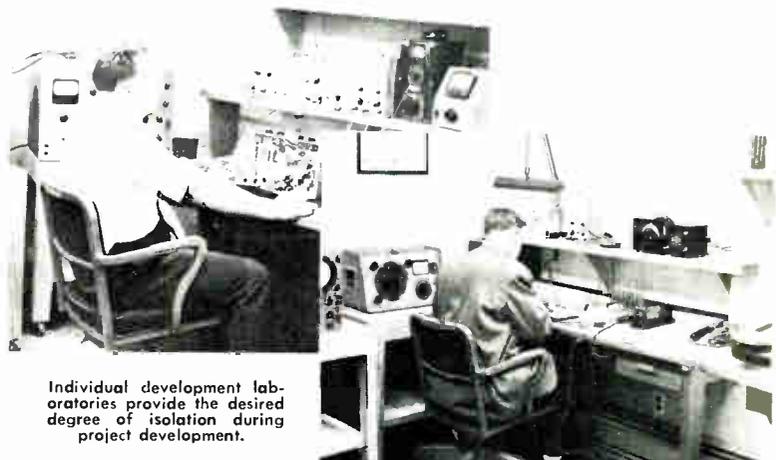
With this new instrument the performance level of audio equipment can be easily and accurately evaluated. At this low price the benefits of intermodulation analysis for accurate audio interpretation are available to all experimenters and audio enthusiasts.

## SPECIFICATIONS

<b>Tube Complement</b> .....	1—12AX7 Cascade Amplifier
	1—12AT7 Detector and Meter Amplifier
	1—6J5 HF Oscillator
	1—6X5 Rectifier
<b>Analyzer Ranges</b> .....	Full Scale 30%—10%—3%
<b>Generator Low Frequency</b> .....	60 cycles (line frequency)
<b>Generator High Frequencies</b> .....	Approx. 3000 and 7000 cycles
<b>LF/HF Ratio</b> .....	4 to 1 voltage normal—can be set to any combination
<b>Generator Output Impedance</b> .....	3000 ohms
<b>Voltmeter Ranges</b> .....	Full Scale 30 Volts—10 Volts—3 Volts
<b>Dimensions</b> .....	7" high x 15" wide x 8" deep
<b>Shipping Weight</b> .....	17 lbs.
<b>Power Requirements</b> .....	105–125V AC, 50–60 cycles, 30 watts (115–230 V on export model)

## ENGINEERING

This department, the Heath Company Engineering Laboratory, is directly responsible for a major portion of the overwhelming success of Heathkits. Year 'round activity is required to constantly check kit models, samples, circuits, etc. Careful investigation determines kit instrument feasibility, lay-out and circuit arrangement. Components are selected on the basis of their quality and adaptability to kit use. When necessary, special designs are used on switches, controls, coils, etc. Only after exhaustive tests of pilot models are Heathkit manuals prepared and kits released for sale. In this manner, Heathkit purchasers are assured of top performance through proven instrument design. Even after an instrument kit is in production, changes in circuits or components are unhesitatingly made if such changes are warranted and result in improved overall kit performance.



Individual development laboratories provide the desired degree of isolation during project development.

**YOU SAVE BY ORDERING DIRECT FROM MANUFACTURER**

# Heathkit

## Heathkit AMATEUR TRANSMITTER KIT

Here is the latest Heathkit addition to the ham radio field, the Model AT-1 Transmitter kit, incorporating many desirable design features at the lowest possible dollar-per-watts price. Panel mounted crystal socket, standby switch, key click filter, AC line filtering, good shielding, etc. VFO or crystal excitation—up to 35 watts input. Built-in power supply provides 425 volts at 100 milliamperes.

This kit features pre-wound coils, single knob band switching, 52 ohm coaxial output, plug-in chassis provisions for VFO or modulator and rugged construction.

Frequency ranges: 80, 40, 20, 15, 11 and 10 meters. Tube lineup: 6AG7 oscillator-multiplier. 6L6 amplifier-doubler, 5U4G rectifier. Physical dimensions: 8½" high x 13½" wide x 7" deep.

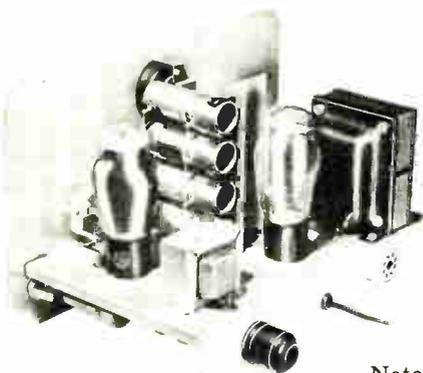
This amazingly low kit price includes all circuit components, tubes, ventilated cabinet, punched chassis and detailed construction manual. The ideal kit for the novice just breaking into ham radio. It can be used as a standby rig or later on as an all band exciter for a higher powered transmitter.



MODEL AT-1

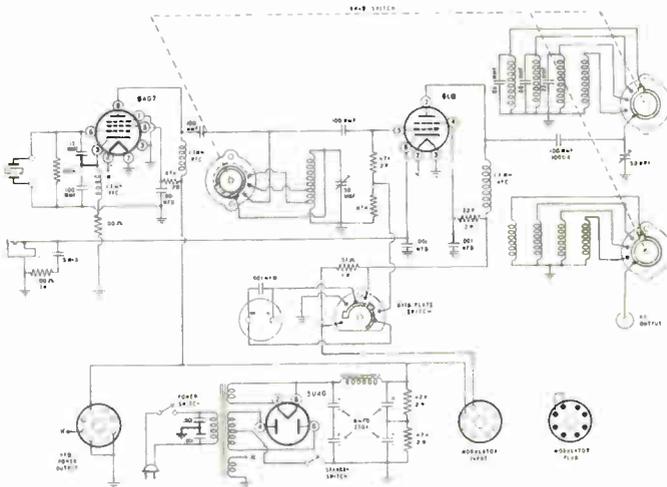
**\$29.50**

SHIPPING  
WT. 15 LBS.



Note the open simplified construction—wiring and assembly is not a problem for

the beginner. Coils are easily mounted and held in place by strong clips—band switch knob changes amplifier and oscillator coils simultaneously—copper plated chassis adds to the attractive overall appearance. This transmitter incorporates tried and proven type tubes and circuits, careful layout and quality components.



## Heathkit ANTENNA IMPEDANCE METER KIT

Use the Heathkit Antenna Impedance Meter for measuring antenna impedance, for line matching purposes, adjustment of beam and mobile antennas, phone monitor, etc. It will determine antenna resistance and resonance, match transmission lines for minimum SWR, determine receiver input impedance and provide close approximation of SWR. Precision resistor, germanium diode, 100 microampere Simpson meter, dial covers range from 0 to 600 ohms to include the popular 600 ohm transmission line. Shielded aluminum cabinet 7" long x 2½" wide x 3¼" deep. Strong antenna terminal connections, easily self supporting.



MODEL AM-1

**\$14.50**

SHIPPING  
WT. 3 LBS.

## NEW Heathkit ANTENNA COUPLER KIT

New Heathkit Antenna Coupler specifically designed for the Heathkit AT-1 Transmitter. This Antenna Coupler can be used with 52 ohms coaxial input up to 75 watts power. Low pass filter with cutoff frequency of approximately 36 mc—L section tuning network—neon tuning indicator—rugged, compact construction—transmitting type variable condenser—copper plated chassis—and high Q coil are all outstanding features. The AC-1 has both inductance and capacity tuning for maximum operating versatility. Dimensions 8½" wide x 4¾" high x 4¾" deep.



MODEL AC-1

**\$14.50**

SHIPPING  
WT. 3 LBS.

LOW COST, HIGH QUALITY HAM EQUIPMENT

# HAM GEAR

## Heathkit COMMUNICATIONS RECEIVER KIT

### DESIGN

To meet the demand for a good, sensitive, low priced communications receiver, we have developed the new Heathkit Model AR-2 Receiver kit. In this design, every attempt was made to include all of the worthwhile features possible and still maintain an economical price level.

One of the decidedly unusual features seldom encountered in this price range is power transformer operation of the power supply system instead of the usual AC-DC system. In addition to increased safety, transformer operation offers the added advantages of stabilized receiver performance and longer tube life.

In this Receiver design, particular consideration was given to simplicity of construction consistent with high performance. This is reflected in practical chassis layout and efficient design. There has been no quality compromise in this new Heathkit AR-2 Receiver. All circuit components are of uniform high quality, tubes are first quality nationally known brands. An attractive cabinet is optionally available at small additional cost.

### FEATURES

Design features of the AR-2 are numerous. Continuous frequency coverage from 535 kc up to 35 mc in four bands includes complete broadcast band coverage. Amateur radio frequencies are identified on the easy-to-read slide rule type dial featuring direct planetary drive. A separate electrical band spread with logging scale operates efficiently throughout the frequency range of the receiver.

Miniature tubes and high gain IF transformers contribute to high operating sensitivity and excellent signal to noise ratio. Complete control of sensitivity level is provided through an RF gain control used in conjunction with AVC or MVC in addition to the usual audio gain control. Separate VFO oscillator tube and circuit, noise limiter, standby switch and headphone jack are also featured. A 5½" PM speaker mounted on the chassis is included with the kit; additional proof of the tremendous value represented.

### CONSTRUCTION

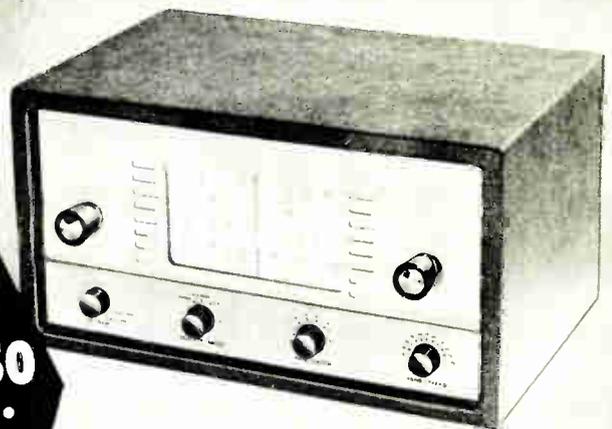
Careful attention has been given to important construction details. For example, the entire coil assembly, trimmer and band switch are mounted and wired as a separate unit before chassis installation. The chassis and all sheet metal parts are copper plated to further add to receiver appearance as well as contribute towards improved performance at higher frequencies.

The step-by-step construction manual is complete with illustrations, full explanation of assembly procedure and description of circuit operation. Large scale pictorials and work sheet are supplied for further convenience.

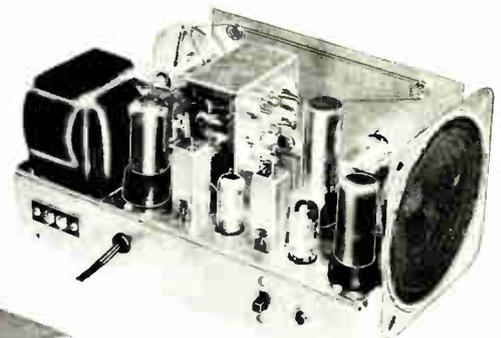
A lettered control plate is included with the kit for Receiver installation in your own cabinet. A full size aluminum panel is furnished with the Heathkit 91-10 cabinet.

### CABINET

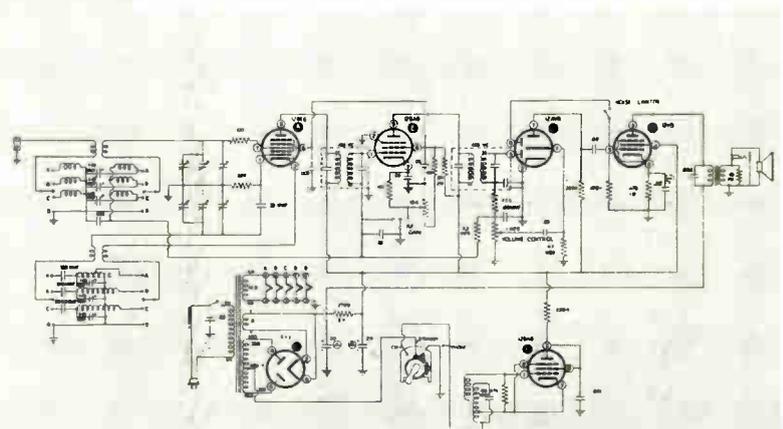
A specially designed cabinet is available, sturdily constructed of plywood with durable proxylin impregnated covering, flocked reinforced speaker grille, aluminum panel and protective rubber pads under the cabinet provide the finishing touches. Cabinet size 12¼" wide x 6¾" high x 7¾" deep. Shipping Weight 5 lbs. Part No. 91-10 \$4.50.



MODEL AR-2  
**\$25<sup>50</sup>**  
SHIPPING  
WT. 12 LBS.



"Unit" coil and range switch turret assembly completely assembled and wired by the kit builder before installation in the chassis. Copper plated coil mounting with aluminum shield plate.



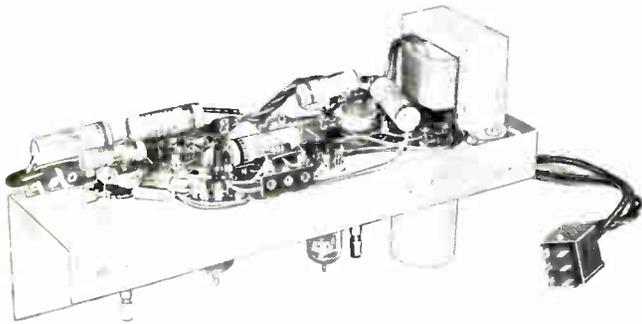
The Heathkit AR-2 schematic clearly illustrates the basic design simplicity as well as the tried and proven circuitry.

# THE *New* HEATHKIT Dual RECORD PLAYER KIT



**IMPORTANT NOTICE!**  
Disregard order blank  
listing of older model  
RP-1.

MODEL RP-2  
**\$69.50**  
SHIPPING  
WT. 33 LBS.



## FEATURES

- Plays all record sizes, all speeds
- Newly developed ceramic cartridge
- Automatic shutoff for both changer and amplifier
- Compensated volume control
- Acoustically correct cabinet enclosure.
- Modern attractive styling.
- Two 6" PM matched speakers
- Easy to assemble

An entirely new introduction to quality record reproduction, a simple to operate, compact, table top model with none of the specialized custom installation problems usually associated with high fidelity systems. Two matched, synchronized speakers mounted in an acoustically correct enclosure reproduce all the music on the record; musical reproduction with the unique sensation of being surrounded by a halo of glorious sound. This spectacular characteristic is possible only because of the diffused non-directional properties of the matched dual speakers. The Heathkit Dual makes listening to fine recorded music a thrilling new experience through naturally clear life-like reproduction of sound at all levels throughout the tonal system. The performance level is vastly superior to that of the ordinary phonograph or console selling for many, many times the price of the Dual.

**RECORD CHANGER** plays all sizes—all speeds—automatic shutoff for changer and amplifier after the last record is played. A wide tonal range ceramic cartridge features an ingenious turn-under twin sapphire stylus for LP or 78 records without turning the cartridge.

**CONSTRUCTION**—Simplified, easy to assemble 4 tube amplifier features compensated volume control and separate tone control. Proxylin impregnated beige and saddle tan fabric covered cabinet supplied completely assembled. You build only the amplifier from step-by-step construction. No specialized tools or knowledge required as full recognition is given to the fact that many purchasers of this kit enjoy good musical reproduction on a purely non-technical basis and the construction manual has been simplified to the point where even the complete novice can successfully construct the Heathkit Dual. The price of the Heathkit Dual includes cabinet, record changer, two 6" PM speakers, tubes and all circuit components required for amplifier construction.

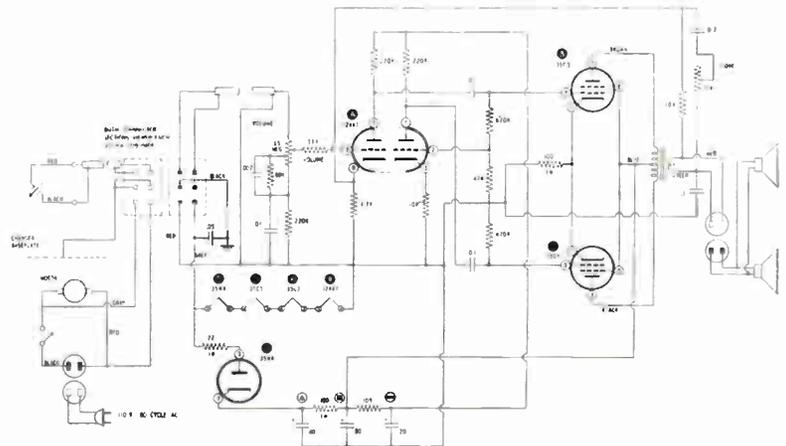
## SPECIFICATIONS

<b>Tube Complement</b> .....	12AX7 Voltage Amplifier and Phase Splitter 2—35C5 Push-Pull Power Amplifiers 35W4 Rectifier
<b>Controls</b> .....	Compensated Volume Control Separate Tone Control
<b>Record Changer</b> .....	Three speed, Automatic shut-off
<b>Speakers</b> .....	2—6" matched
<b>Cabinet</b> .....	Proxylin Impregnated Fabric Covered
<b>Dimensions</b> .....	21" x 11" x 13 1/2"
<b>Shipping Weight</b> .....	33 lbs.
<b>Power Requirements</b> .....	117 volts 60 cycle AC, 45 watts

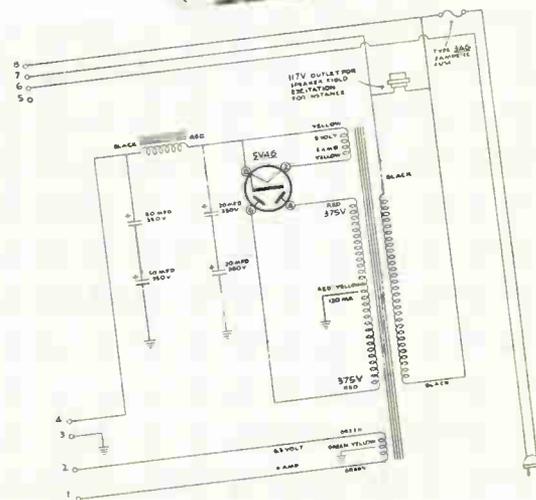
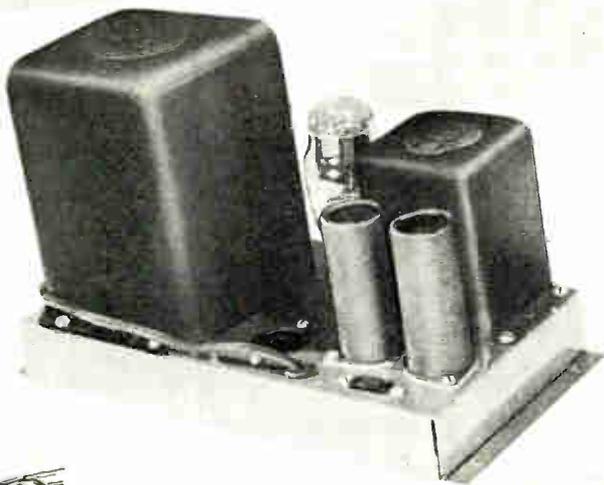
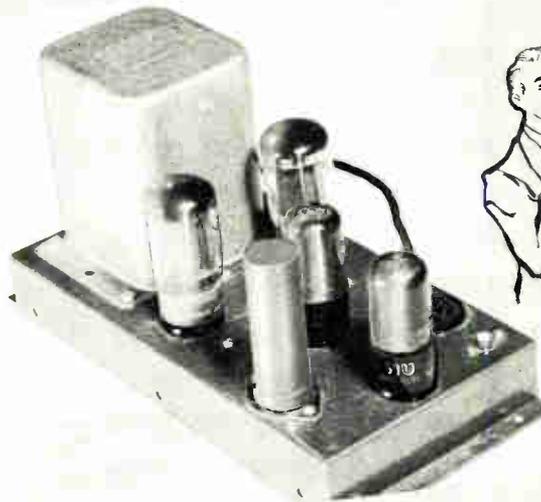
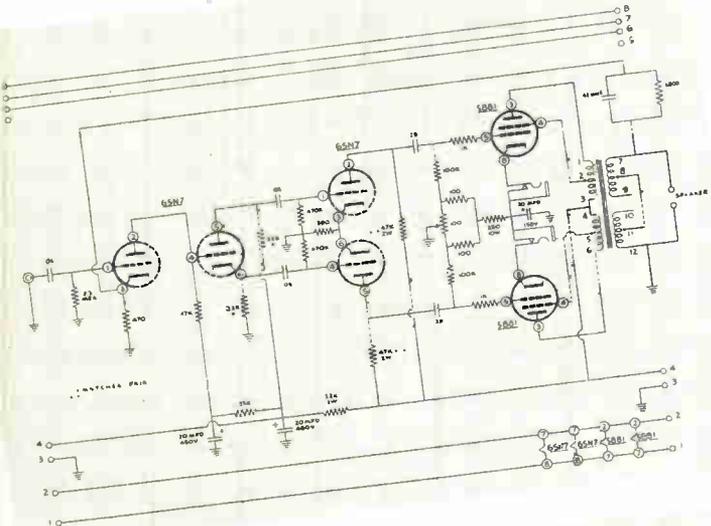
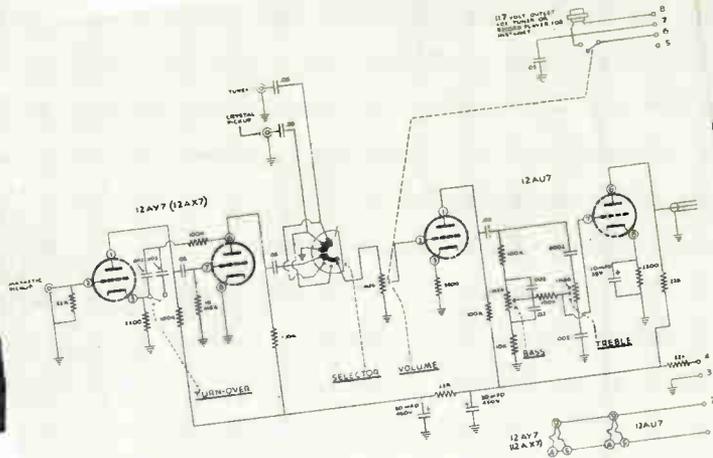
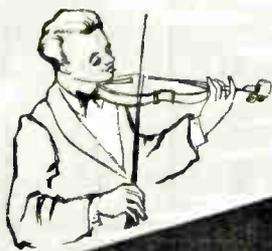
## SPEAKERS

Recommended for Heathkit A-7B and A-7C Amplifier kits.  
Model 401-5. 12" PM Speaker. Voice coil impedance 4 ohms.  
Shipping Wt. 7 lbs. .... **\$6.95**

Recommended for Heathkit A-9A Amplifier kit.  
Model 401. 12" PM Speaker. Voice coil impedance 8 ohms.  
Shipping Wt. 7 lbs. .... **\$7.50**







## TECHNICAL

### PREAMPLIFIER (WA-P1)

- Tube Complement..... 1—12AY7 (or 12AX7) pre-amplifier  
1—12AU7 tone control amplifier
- Switch selected inputs..... 2—low gain for crystal pickup and tuner  
1—high gain for magnetic pickup for 78 RPM and LP on high gain channel for 15 db max., cuts 15 db max.
- Switch selected turn-over..... boosts 15 db max., cuts 15 db max.
- Bass tone control at 20 cycles..... 0.2 volts across 1 megohm on low gain channels
- Treble tone control at 20 KC..... 0.004 volts across 22K on high gain channel
- Input voltage at 1 KC for 1.2 volts output..... 220 V DC at 6 ma and 6.3 V at 600 ma
- Power requirements..... 2 1/4" high x 10 1/4" wide x 7 1/4" deep.
- Dimensions less shafts and knobs.....

## SPECIFICATIONS

### AMPLIFIER AND POWER SUPPLY

- Tube Complement..... 1—6SN7 1/2 6SN7 cascade amplifier  
1—6SN7 phase splitter  
1—6SN7 push pull driver  
1—5881 push pull power amplifier  
1—5V4G cathode type rectifier
- Frequency response..... less than 0.5% between 20 cycles and 20 KC.
- Harmonic distortion at 5 watt output..... 0.5% using 60 and 3000 cycles.
- IM distortion at 5 watt equivalent output..... 4, 8, or 16 ohms.
- Output impedance..... .75 volts across 2.2 megohms.
- Input voltage for 5 watt output..... 105—125 volts 50/60 cycles 120 watts.
- Power requirements..... 7" high x 5 1/2" wide x 11" long.
- Over-all dimensions (each unit).....

# Heathkit Williamson Type AMPLIFIER KIT

Music has captured and held the imagination of the world since the dawn of man. From rhythms first born on tapping sticks and throbbing drums of savages, then set to music by Crusader's trumpets, ballads of the strolling minstrels and simple folk songs of every land have come the beloved songs and breathtaking symphonies of our day. Through music have been expressed the triumphs, hopes and moods of men since earliest times. Regardless of individual taste, music brings to all our lives greater enjoyment and relaxation.

Too few people realize the musical enjoyment that is theirs for the asking. No longer must one be within reach of concert halls or theatres to hear a favorite orchestra or artist. Now music is yours to command. Enjoy private command performances of great symphonies or toe-tapping rhythms of dance orchestras in your home when you want to hear them. During the past few years a steadily growing awareness has developed regarding the desirability of private ownership of a system capable of fine reproduction of beautifully recorded music. Why shouldn't you too realize full enjoyment of the possibilities available? Today, high fidelity music

has been brought into the financial range of everyone.

Basic requirements for a home installed high fidelity system are the same whether you design your installation for a basement room or for an elaborate built-in home entertainment center. Required are a signal source such as an FM tuner, automatic record changer or tape machine, an amplifier to build up the weak signals from the signal source and provide control over tone and volume, and a loud speaker to change the amplified electrical impulses into sound. In the past, the high fidelity amplifier has been the most costly of the three. This has been the particular field of Heath Company endeavor.

Great savings have been made through standardization of components, mass production, high volume sales and elimination of labor costs so that now it is possible for you to enjoy the thrill of building your own high fidelity Heathkit Williamson type Amplifier as the nucleus of your own high fidelity system. Interested? Of course you are. Review the facts of what the Heath Company has to offer. Send for your free copy of "High Fidelity Especially for You."

## "HIGH FIDELITY ESPECIALLY FOR YOU"

A frank discussion of hi-fi problems and their solution written for the information of the non-technical music lover. Send for your complimentary copy available only from the Heath Company.

### AMPLIFIER KIT

Two years ago the Heath Company entered the hi-fi field with its now famous Heathkit Williamson type Amplifier. This Amplifier is constructed by the purchaser entirely from a kit of parts, material and instruction book. The Heathkit high fidelity Amplifier uses the sound, basic, simple design of the popular widely accepted Williamson type circuit. The advantages of this circuit are unusually brilliant reproduction with full fidelity and more than adequate maximum power level. When used in conjunction with the Heathkit preamplifier unit, complete control of either bass or treble tone and volume is provided, in addition to correct input selection and compensation.

This fine Heathkit Amplifier is supplied complete in every respect. The price includes all tubes as well as other required constructional components. Sheet metal fabrication has already been done for you and there is no tedious cutting, drilling or punching. Chassis and cabinet are finished in an attractive gray hammertone. Control shafts are of the adjustable length breakoff type that readily adapt to individual custom installation requirements.

### CONSTRUCTION MANUAL

Full recognition was given to the fact that many potential purchasers of this kit enjoy high fidelity reproduction of fine recorded music on a purely non-technical basis. Therefore, the construction and assembly procedure has been simplified to the point where even the complete novice can successfully construct the Amplifier with absolutely no electrical knowledge or mechanical dexterity required. It is merely necessary to follow the detailed step-by-step construction manual procedure and be guided by the many large pictorials and drawings supplied.

Here then is the amplifier that meets every requirement for high fidelity and makes listening to recorded music a thrilling, new experience through naturally clear and life-like reproduction of sound at all levels throughout the tonal spectrum. Reproduction that gives true balance, depth and full range of the original live performance. Enjoy the utmost in life-like realism of beautifully recorded music through the purchase of this fine Heathkit Williamson type Amplifier.

To offset any glib advertising claims, further information regarding the Heathkit Williamson type Amplifier performance can be obtained from "Consumer's Research Annual Cumulative Bulletin 1953-54," page 206.

### OUTPUT TRANSFORMERS

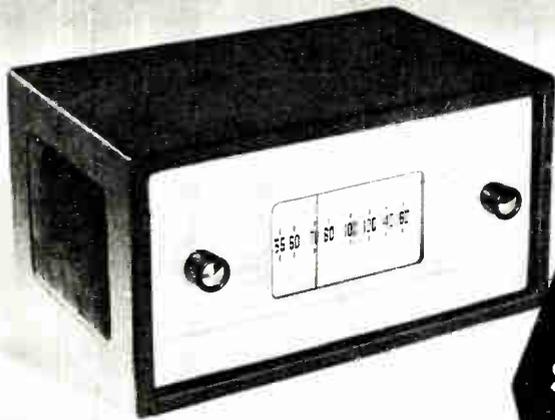
The output transformer used in any fine hi-fi amplifier is the very heart of the circuit and determines the overall quality and performance. Of the many fine transformers available, the Heath Company has selected two popular types, the Acrosound TO-300 Output Transformer and the Altec-Lansing Peerless 20-20 Output Transformer.

The Acrosound Output Transformer features the use of Ultra-linear circuitry which is an exclusive development of the Acro Products Company. This new Ultra-linear circuit provides a greater margin of reserve power efficiency and increases the maximum power output.

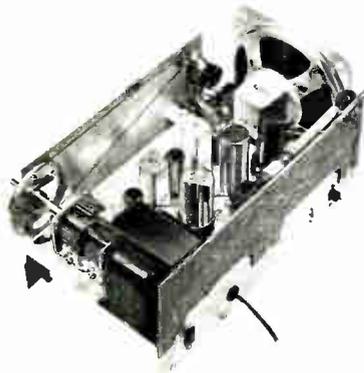
The Heathkit Williamson type Amplifier utilizing the Altec-Lansing Peerless 20-20 Transformer closely adheres to the original Williamson type circuit by permitting construction either as a triode amplifier or optional extended power circuitry through the use of additional primary winding taps.

### PRICES OF VARIOUS COMBINATIONS

W-2 Amplifier Kit (Incl. Main Amplifier with Altec-Lansing Peerless 20-20 Output Transformer, Power Supply and WA-P1 Preamplifier Kit) Shipping Weight 37 lbs. Shipped express only .....	<b>\$69<sup>50</sup></b>
W-2M Amplifier Kit (Incl. Main Amplifier with Altec-Lansing Peerless 20-20 Output Transformer and Power Supply) Shipping Weight 29 lbs. Shipped express only ..	<b>\$49<sup>75</sup></b>
W-3 Amplifier Kit (Incl. Main Amplifier with Acrosound Output Transformer, Power Supply and WA-P1 Preamplifier Kit) Shipping Weight 37 lbs. Shipped express only .....	<b>\$69<sup>50</sup></b>
W-3M Amplifier Kit (Incl. Main Amplifier with Acrosound Output Transformer and Power Supply) Shipping Weight 29 lbs. Shipped express only .....	<b>\$49<sup>75</sup></b>
WA-P1 Preamplifier Kit only. Shipping Weight 6 lbs. Shipped express or parcel post.....	<b>\$19<sup>75</sup></b>



**MODEL BR-2**  
**\$17.50**  
 SHIPPING  
 WT. 11 LBS.



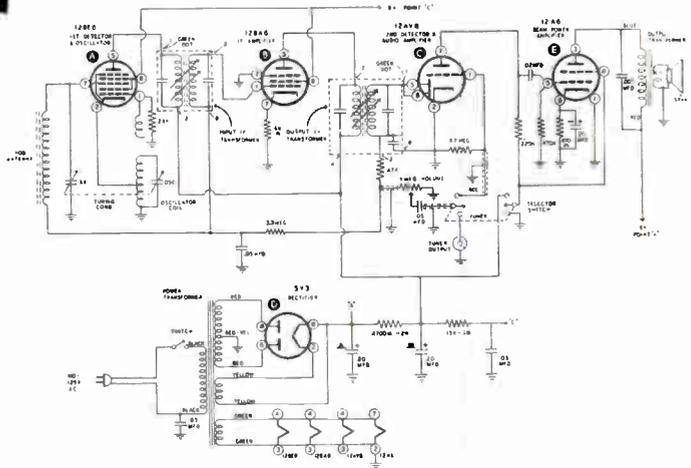
**CABINET**—Proxilyn impregnated fabric covered plywood cabinet. 12¼" wide, 6¾" high, 7¾" deep. Shipping weight 5 lbs. Part No. 91-9.....**\$4.50**

# Heathkit BROADCAST BAND RECEIVER KIT

Here is the ideal radio kit for the student, beginner or hobbyist. If you have ever had the urge to build your own radio receiver, this kit really warrants your attention. An outstanding feature seldom encountered in so-called beginners kits is that the entire receiver is transformer operated, thereby eliminating the shock hazards usually associated with AC-DC circuits.

New high gain miniature tubes and IF transformers provide excellent sensitivity and good signal to noise ratio. A powerful ferrite core, built-in rod type antenna has been provided. A chassis mounted 5½" PM speaker provides excellent volume and tone quality not ordinarily expected in this low price range. Can be operated either as a receiver or tuner at the flick of a switch.

This Heathkit is supplied complete with all tubes, chassis, speaker, circuit components and a completely detailed construction manual. Tube line up, 12BE6 mixer oscillator, 12BA6 IF amplifier, 12AV6 detector—AVC—first audio, 12A6 beam power output, 5Y3GT rectifier.



# Heathkit FM TUNER KIT

## FEATURES

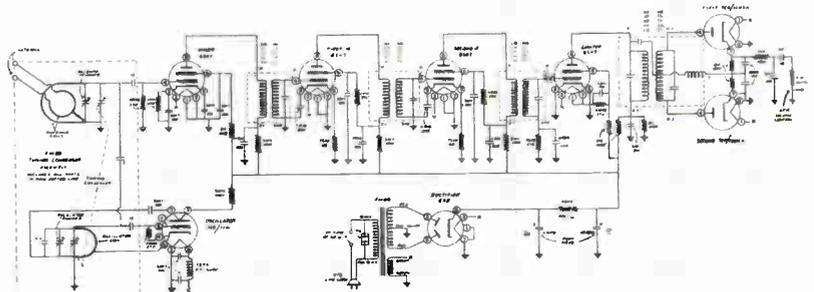
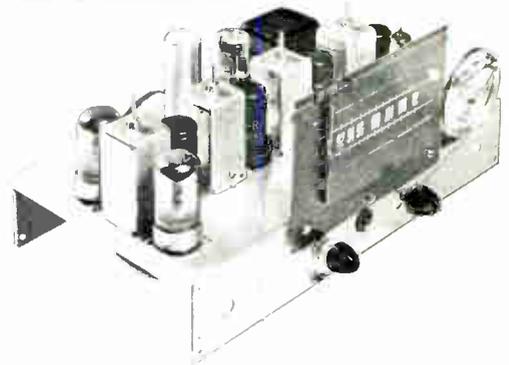
- 88 to 108 megacycle frequency coverage.
- Pre-assembled and tuned "front end."
- Double slug tuned IF transformers.
- 8 tube circuit.
- High sensitivity level.
- Slide rule type dial.
- Vernier tuning.
- Power transformer operated.

The Heathkit Model FM-2 Tuner was specifically designed for simplified kit construction. It can be operated through the "phono" portion of your radio or with a separate amplifier. The AC transformer operated circuit simplifies the use of the FM-2 with other equipment by eliminating the annoying problems peculiar to AC-DC type equipment.

This kit features a pre-assembled and adjusted tuning unit, three double tuned IF transformers and a discriminator transformer in an 8 tube circuit. Smooth tuning is obtained through a 9 to 1 ratio vernier drive using a calibrated 6" slide rule type dial.

Here is an opportunity to experience the thrill of building your own FM Tuner and at the same time enjoy all of the advantages of true FM reception. The complete kit is supplied with all tubes and necessary material in addition to a detailed instruction manual.

**MODEL FM-2**  
**\$22.50**  
 SHIPPING  
 WT. 9 LBS.



C

# ORDER BLANK

**7<sup>th</sup> HEATH COMPANY**  
**BENTON HARBOR,**  
**MICHIGAN**

PHONE BENTON HARBOR 5-1175

From \_\_\_\_\_

**SHIP VIA**

- Parcel Post  
 Express  
 Motor Freight  
 Best Way

(PLEASE PRINT)

Quantity	Item and Shipping Wt.		Price
	Oscilloscope Kit	Model O-9 28 lbs.	\$59.50
	Voltage Calibrator Kit	Model VC-2 4 lbs.	11.50
	Electronic Switch Kit	Model S-2 11 lbs.	23.50
	Scope Demodulator Probe Kit	No. 337-B 1 lb.	3.50
	Low Capacity Probe Kit	No. 342 1 lb.	3.50
	TV Alignment Generator Kit	Model TS-3 18 lbs.	44.50
	Multimeter Kit	Model MM-1 6 lbs.	26.50
	Grid Dip Meter Kit	Model GD-1B 4 lbs.	19.50
	Low Frequency Coils for GD-1B	No. 341-A 1 lb.	3.00
	Low Frequency Coils for GD-1 and GD-1A	No. 341 1 lb.	3.00
	Vacuum Tube Voltmeter Kit	Model V-6 6 lbs.	24.50
	Radio Frequency Probe Kit	No. 309-B 1 lb.	3.50
	High Voltage Probe Kit	No. 336 2 lbs.	4.50
	Peak-to-Peak Voltage Probe Kit	No. 338-B 2 lbs.	5.50
	RF Signal Generator Kit	Model SG-8 8 lbs.	19.50
	Visual-Aural Signal Tracer Kit	Model T-3 10 lbs.	23.50
	Condenser Checker Kit	Model C-3 8 lbs.	19.50
	Bar Generator Kit	Model BG-1 5 lbs.	14.50
	Laboratory Generator Kit	Model LG-1 16 lbs.	39.50
	Tube Checker Kit	Model TC-2 12 lbs.	29.50
	Portable Tube Checker Kit	Model TC-2P 15 lbs.	34.50
	Portable Tube Checker Cab. only	No. 91-8 7 lbs.	7.50
	Television Picture Tube Adapter	No. 355 1 lb.	4.50
	Battery Eliminator Kit	Model BE-4 18 lbs.	31.50
	Vibrator Tester Kit	Model VT-1 6 lbs.	14.50
	Isolation Transformer Kit	Model IT-1 9 lbs.	16.50
	Audio Generator Kit	Model AG-8 11 lbs.	29.50
	Audio Oscillator Kit	Model AO-1 11 lbs.	24.50
	Audio Frequency Meter Kit	Model AF-1 12 lbs.	34.50

Quantity	Item and Shipping Wt.		Price
	Square Wave Generator Kit	Model SQ-1 12 lbs.	\$29.50
	AC Vacuum Tube Voltmeter Kit	Model AV-2 5 lbs.	29.50
	Q Meter Kit	Model QM-1 14 lbs.	44.50
	Audio Wattmeter Kit	Model AW-1 6 lbs.	29.50
	Intermodulation Analyzer Kit	Model IM-1 17 lbs.	39.50
	Amateur Transmitter Kit	Model AT-1 15 lbs.	29.50
	Antenna Coupler Kit	Model AC-1 3 lbs.	14.50
	Antenna Impedance Meter Kit	Model AM-1 3 lbs.	14.50
	Regulated Power Supply Kit	Model PS-2 17 lbs.	33.50
	Handitester Kit	Model M-1 3 lbs.	14.50
	Decade Resistance Kit	Model DR-1 4 lbs.	19.50
	Decade Condenser Kit	Model DC-1 4 lbs.	16.50
	Impedance Bridge Kit	Model IB-2 15 lbs.	59.50
	Battery Tester Kit	Model BT-1. 2 lbs.	8.50
	Resistance Substitution Box Kit	Model RS-1 2 lbs.	5.50
	Condenser Substitution Box Kit	Model CS-1 2 lbs.	5.50
	Technical Application Bulletins	No. 360 3 lbs.	2.00
	Binding Post Kit	No. 362-A 1 lb.	4.00
	FM Tuner Kit	Model FM-2 9 lbs.	22.50
	Broadcast Band Receiver Kit	Model BR-2 11 lbs.	17.50
	Broadcast Band Receiver Cab.	No. 91-9 5 lbs.	4.50
	Communications Receiver Kit	Model AR-2 12 lbs.	25.50
	Communications Receiver Cab.	No. 91-10 5 lbs.	4.50
	6 Watt Amplifier Kit	Model A-7B 10 lbs.	15.50
	6 Watt Amp. Kit w/Preomp.	Model A-7C 10 lbs.	17.50
	20 Watt Amplifier Kit	Model A-9A 18 lbs.	35.50
	Dual Record Player Kit	Model RP-1 31 lbs.	59.50
	<b>Williamson Type Amplifier Kits.</b> Please write combination desired in space below. Various combinations listed on pages 36 and 37.		

On Parcel Post Orders, include postage for weight shown.

On Express Orders, do not include transportation charges—they will be collected by the Express Agency at time of delivery.

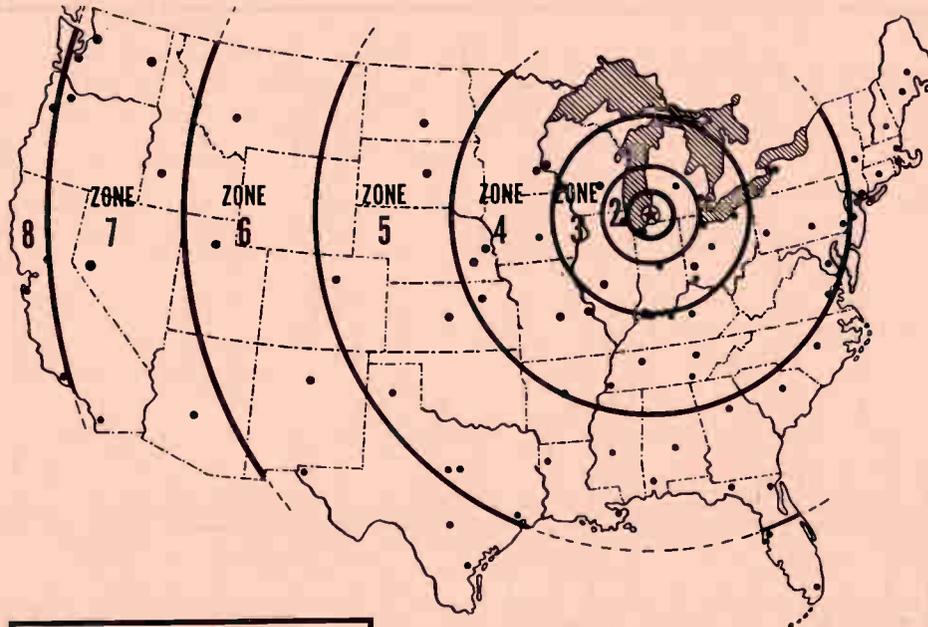
ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Litho in U. S. A.

Enclosed find  Check  Money Order for \_\_\_\_\_

Please ship C.O.D.  Postage enclosed for \_\_\_\_\_ lbs.

\*Orders from Canada must be accompanied by cash payment including postage.



### IMPORTANT CHANGE

Insurance fees on Parcel Post shipment have been discontinued. This change will result in much faster service in filling your order and further savings. In event you have a damage claim write directly to the HEATH COMPANY and not to the Post Office.

### REFER TO PARCEL POST RATE TABLE

at right for the correct amount to include in your remittance for postage. For example, if your order adds up to 16 pounds and 10 ounces and you live in Zone 2, the postage on your merchandise would be 87¢. If you do not know your postal zone, ask your postmaster.

### INCLUDE MONEY FOR POSTAGE

with your order 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.

SHIPPING WEIGHT IN POUNDS	LOCAL	ZONE 1&2	ZONE 3	ZONE 4	ZONE 5	ZONE 6	ZONE 7	ZONE 8
<b>Postal Regulations . . .</b> limit parcel post shipments to 20 pounds to zones 3 to 8, and 40 pounds to zones 1 and 2. <b>EXCEPTION:</b> Shipments up to 70 pounds will still be accepted to RFD addresses, and to APO numbers.								
9 oz. to 1 lb.	\$.18	\$.23	\$.23	\$.24	\$.26	\$.28	\$.30	\$.32
1 lb. 1 oz. to 2 lbs.	.20	.27	.29	.31	.36	.40	.46	.51
2 lb. 1 oz. to 3 lbs.	.21	.31	.34	.38	.45	.52	.61	.69
3 lb. 1 oz. to 4 lbs.	.23	.35	.39	.45	.54	.64	.76	.87
4 lb. 1 oz. to 5 lbs.	.24	.39	.44	.52	.63	.76	.91	1.05
5 lb. 1 oz. to 6 lbs.	.26	.43	.49	.59	.73	.88	1.06	1.23
6 lb. 1 oz. to 7 lbs.	.27	.47	.54	.66	.82	1.00	1.22	1.41
7 lb. 1 oz. to 8 lbs.	.29	.51	.60	.73	.91	1.12	1.37	1.59
8 lb. 1 oz. to 9 lbs.	.30	.55	.65	.80	1.00	1.24	1.52	1.77
9 lb. 1 oz. to 10 lbs.	.32	.59	.70	.87	1.10	1.36	1.67	1.95
10 lb. 1 oz. to 11 lbs.	.33	.63	.75	.93	1.19	1.48	1.82	2.13
11 lb. 1 oz. to 12 lbs.	.34	.67	.80	1.00	1.28	1.60	1.98	2.31
12 lb. 1 oz. to 13 lbs.	.36	.71	.85	1.07	1.37	1.72	2.13	2.49
13 lb. 1 oz. to 14 lbs.	.37	.75	.90	1.14	1.47	1.84	2.28	2.67
14 lb. 1 oz. to 15 lbs.	.39	.79	.96	1.21	1.56	1.96	2.43	2.85
15 lb. 1 oz. to 16 lbs.	.40	.83	1.01	1.28	1.65	2.08	2.58	3.03
16 lb. 1 oz. to 17 lbs.	.42	.87	1.06	1.35	1.74	2.20	2.74	3.21
17 lb. 1 oz. to 18 lbs.	.43	.91	1.11	1.42	1.84	2.32	2.89	3.39
18 lb. 1 oz. to 19 lbs.	.45	.95	1.16	1.49	1.93	2.44	3.04	3.57
19 lb. 1 oz. to 20 lbs.	.46	.99	1.21	1.56	2.02	2.56	3.19	3.75
<b>DISTANCE FROM BENTON HARBOR</b>								
Local Zone . . . In Benton Harbor	Zone 5 . . . . . 601 to 1000 mi.							
Zones 1 & 2 . . . not over 150 mi.	Zone 6 . . . . . 1001 to 1400 mi.							
Zone 3 . . . . . 151 to 300 mi.	Zone 7 . . . . . 1401 to 1800 mi.							
Zone 4 . . . . . 301 to 600 mi.	Zone 8 . . . . . Over 1800 mi.							

# ORDER BLANK

**7<sup>th</sup> HEATH COMPANY**  
**BENTON HARBOR,**  
**MICHIGAN**

PHONE BENTON HARBOR 5-1175

*From* \_\_\_\_\_

**SHIP VIA**

- Parcel Post
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- Motor Freight
- Best Way

(PLEASE PRINT)

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	Electronic Switch Kit	Model S-2 11 lbs.	23.50
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	Low Capacity Probe Kit	No. 342 1 lb.	3.50
	TV Alignment Generator Kit	Model TS-3 18 lbs.	44.50
	Multimeter Kit	Model MM-1 6 lbs.	26.50
	Grid Dip Meter Kit	Model GD-1B 4 lbs.	19.50
	Low Frequency Coils for GD-1B	No. 341-A 1 lb.	3.00
	Low Frequency Coils for GD-1 and GD-1A	No. 341 1 lb.	3.00
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	Binding Post Kit	No. 362-A 1 lb.	4.00
	FM Tuner Kit	Model FM-2 9 lbs.	22.50
	Broadcast Band Receiver Kit	Model BR-2 11 lbs.	17.50
	Broadcast Band Receiver Cab.	No. 91-9 5 lbs.	4.50
	Communications Receiver Kit	Model AR-2 12 lbs.	25.50
	Communications Receiver Cab.	No. 91-10 5 lbs.	4.50
	6 Watt Amplifier Kit	Model A-7B 10 lbs.	15.50
	6 Watt Amp. Kit w/Preamp.	Model A-7C 10 lbs.	17.50
	20 Watt Amplifier Kit	Model A-9A 18 lbs.	35.50
	Dual Record Player Kit	Model RP-1 31 lbs.	59.50
	<b>Williamson Type Amplifier Kits.</b> Please write combination desired in space below. Various combinations listed on pages 36 and 37.		

On Parcel Post Orders, include postage for weight shown.

On Express Orders, do not include transportation charges—they will be collected by the Express Agency at time of delivery.

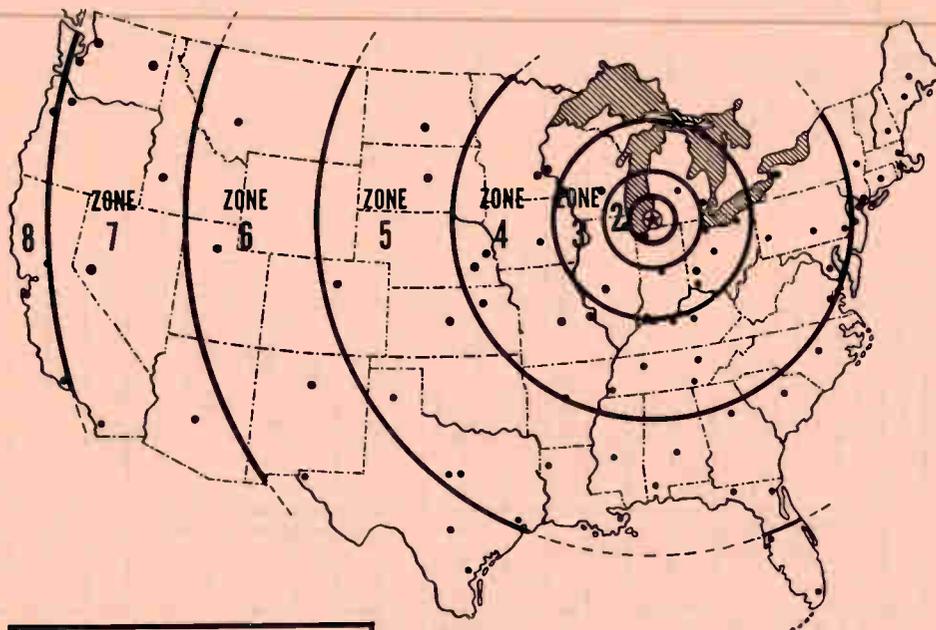
ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Litho in U.S.A.

Enclosed find  Check  Money Order for \_\_\_\_\_

Please ship C.O.D.  Postage enclosed for \_\_\_\_\_ lbs.

\*Orders from Canada must be accompanied by cash payment including postage.



### IMPORTANT CHANGE

Insurance fees on Parcel Post shipment have been discontinued. This change will result in much faster service in filling your order and further savings. In event you have a damage claim write directly to the HEATH COMPANY and not to the Post Office.

### REFER TO PARCEL POST RATE TABLE

at right for the correct amount to include in your remittance for postage. For example, if your order adds up to 16 pounds and you live in Zone 2, the postage on your merchandise would be 87¢. If you do not know your postal zone, ask your postmaster.

### INCLUDE MONEY FOR POSTAGE

with your order 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.

SHIPPING WEIGHT IN POUNDS	LOCAL	ZONE 1&2	ZONE 3	ZONE 4	ZONE 5	ZONE 6	ZONE 7	ZONE 8
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**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.

9 oz. to 1 lb.	\$.18	\$.23	\$.23	\$.24	\$.26	\$.28	\$.30	\$.32
1 lb. 1 oz. to 2 lbs.	.20	.27	.29	.31	.36	.40	.46	.51
2 lb. 1 oz. to 3 lbs.	.21	.31	.34	.38	.45	.52	.61	.69
3 lb. 1 oz. to 4 lbs.	.23	.35	.39	.45	.54	.64	.76	.87
4 lb. 1 oz. to 5 lbs.	.24	.39	.44	.52	.63	.76	.91	1.05
5 lb. 1 oz. to 6 lbs.	.26	.43	.49	.59	.73	.88	1.06	1.23
6 lb. 1 oz. to 7 lbs.	.27	.47	.54	.66	.82	1.00	1.22	1.41
7 lb. 1 oz. to 8 lbs.	.29	.51	.60	.73	.91	1.12	1.37	1.59
8 lb. 1 oz. to 9 lbs.	.30	.55	.65	.80	1.00	1.24	1.52	1.77
9 lb. 1 oz. to 10 lbs.	.32	.59	.70	.87	1.10	1.36	1.67	1.95
10 lb. 1 oz. to 11 lbs.	.33	.63	.75	.93	1.19	1.48	1.82	2.13
11 lb. 1 oz. to 12 lbs.	.34	.67	.80	1.00	1.28	1.60	1.98	2.31
12 lb. 1 oz. to 13 lbs.	.36	.71	.85	1.07	1.37	1.72	2.13	2.49
13 lb. 1 oz. to 14 lbs.	.37	.75	.90	1.14	1.47	1.84	2.28	2.67
14 lb. 1 oz. to 15 lbs.	.39	.79	.96	1.21	1.56	1.96	2.43	2.85
15 lb. 1 oz. to 16 lbs.	.40	.83	1.01	1.28	1.65	2.08	2.58	3.03
16 lb. 1 oz. to 17 lbs.	.42	.87	1.06	1.35	1.74	2.20	2.74	3.21
17 lb. 1 oz. to 18 lbs.	.43	.91	1.11	1.42	1.84	2.32	2.89	3.39
18 lb. 1 oz. to 19 lbs.	.45	.95	1.16	1.49	1.93	2.44	3.04	3.57
19 lb. 1 oz. to 20 lbs.	.46	.99	1.21	1.56	2.02	2.56	3.19	3.75

### DISTANCE FROM BENTON HARBOR

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

# New TECHNICAL BULLETINS

## SERVICE TO HEATHKIT OWNERS

A series of "Heathkit Technical Application Bulletins" have been prepared and are offered as an additional customer service. Possession of the Technical Application Bulletins will greatly enlarge the scope of instrument usefulness through the very suggestion of applications that may have been overlooked regarding test procedures or combinations of instruments that may be used. This technical material has been written expressly for the Heath Company by well known technical writers who are recognized authorities in their respective fields.

The entire set consists of fifty-two four page bulletins, each bulletin complete in itself and containing all necessary schematics, pictorial drawings or photographs. A convenient cross reference index sheet is included so that bulletins dealing with the various instrument applications may be quickly identified. The material is presented in a readily understood manner and clearly indicates test procedures, interesting experiments and the results to be expected.

**BINDERS**—A good quality black, loose-leaf, flexible binder is provided and it is of adequate size to accommodate future bulletin releases. The binder also provides a convenient method of retaining Heathkit Flyer publications for future reference.

The Heathkit Technical Application Bulletins, including the flexible three ring binder, attractively printed in gold, can be purchased only from the Heath Company for the modest price of \$2.00. No C. O. D. orders on this item please.



Heathkit Technical Application Bulletins. Shipping Weight 3 lbs. \$2.00.

## LABORATORY AND SERVICE SHOP BOOKLETS



This 1954 Heathkit catalog supplies full information about the *largest* and most *complete* selection of electronic kits available anywhere. This wonderful selection of Heathkits has been made possible only through your help and cooperation as these kits represent what you want and expect in kit form electronic equipment.

Many of you who purchased Heathkits five and six years ago will remember the startling impression they made upon the field of electronics. There were many scoffers who contended that truly successful instruments were not possible on a "build your own basis." Heath Company pioneering in the kit field and continued encouragement from you soon proved that Heathkits presented an entirely logical and practical method of building down-to-earth useful equipment without requiring the investment of a small fortune.

The phenomenal success of Heathkits can not be attributed to low price alone. They actually represent high quality electronic equipment at low prices made possible through high volume production, direct merchandising and streamlined efficient operation. The Heathkit VTVM is an excellent example of top quality and performance. Almost two out of every three VTVMs, kit or manufactured, sold last year were Heathkits. No other instrument company can even approach that production and sales level.

We at the Heath Company know that you are with us and are backing our efforts with your continued support. The selection of Heathkits will grow, kits will continue to improve and quality level will remain high. Continued progress is an outstanding characteristic of the Heath Company. We are never content to coast along on previous accomplishments.

Thank you again for your support, encouragement and enthusiasm. With your continued help we all can look forward to bigger and better Heathkits in the future.

planning  
your  
service  
business

establishing  
the industrial  
electronics  
laboratory

"PLANNING YOUR SERVICE BUSINESS" by John T. Frye, popular author of "Mac's Radio Service Shop" monthly feature in Radio and Television News magazine. Here is complete first hand information written in a refreshing, authoritative style by a man who has had over a quarter of a century experience in radio and television service work.

In this booklet, John T. Frye discusses all factors involved in establishing a service business. Consideration is given to the type of business, location, selection of tools and instruments as well as bookkeeping procedure. Many important details are stressed, such as appearance, personality, punctuality, integrity, etc. Suggested methods of business operation, service job records, business promotions and other similar worthwhile subjects are clearly discussed.

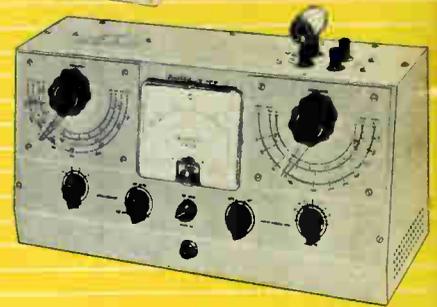
This 8½ by 11 inch booklet is available to interested Heathkit customers at no charge. Just write in and ask for your free copy.

"ESTABLISHING THE INDUSTRIAL ELECTRONICS LABORATORY" by Louis B. Garner, Jr. In this booklet, full consideration has been given all factors required in establishing a laboratory, regardless of its size. The following information is presented in an informative, detailed manner and all aspects are thoroughly discussed. Type of laboratory—laboratory lay-out—space allotment—lighting and service facilities—personnel—heating and air conditioning, etc. The types of work benches, as well as other details such as desks, stools, shelves, cabinets drafting table, etc. are discussed.

This interesting, comprehensive booklet is also offered to interested Heathkit customers at no charge. Just write and ask for it.

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