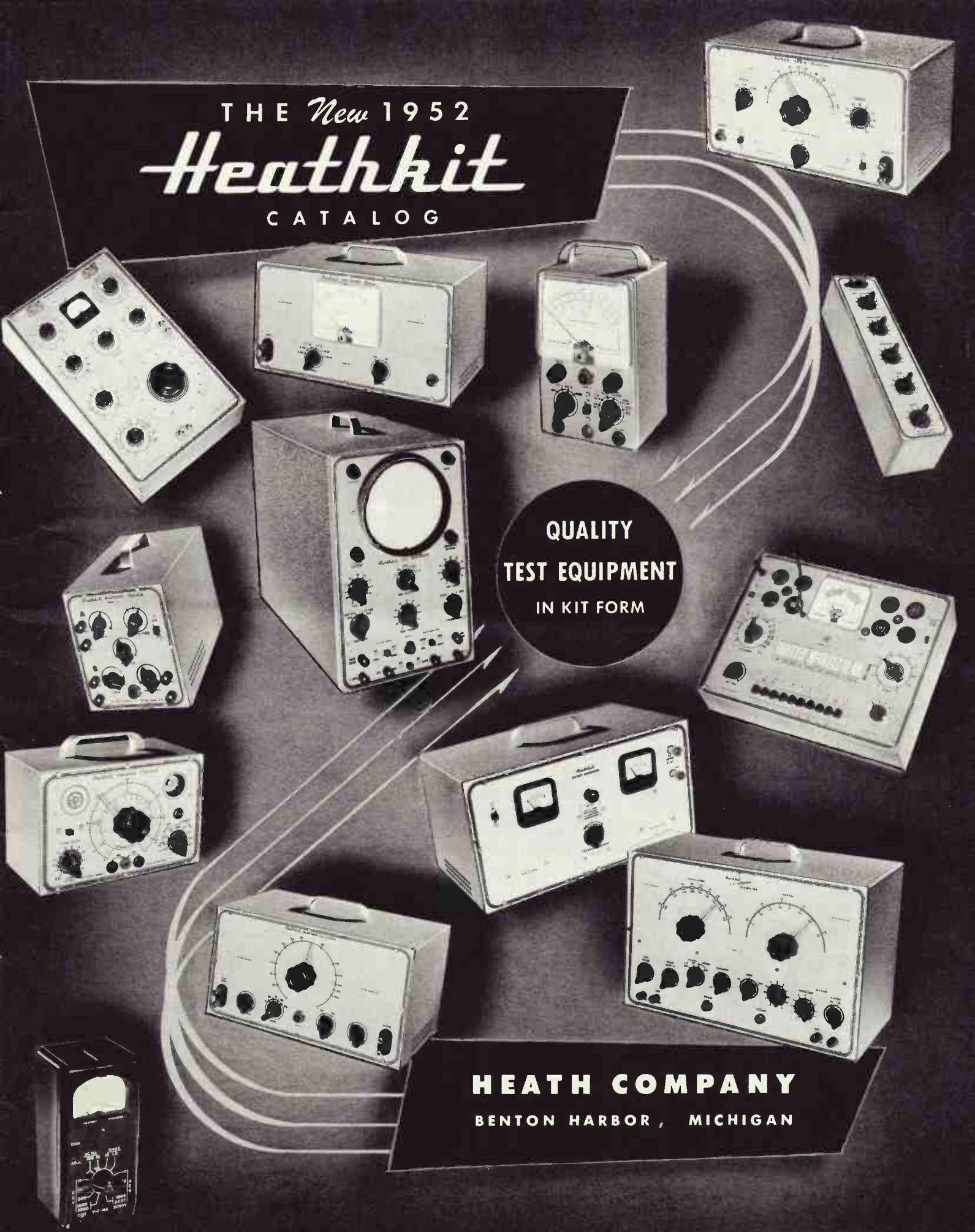
THE *New* 1952

Heathkit

CATALOG



QUALITY
TEST EQUIPMENT
IN KIT FORM

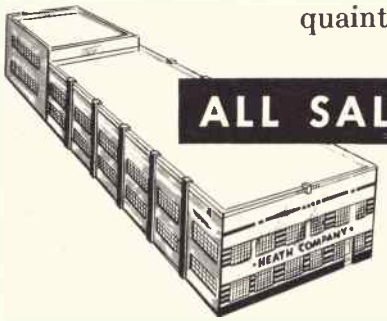
HEATH COMPANY
BENTON HARBOR, MICHIGAN

A Message to our customers

Heathkits fill a major need in the radio industry, for they form the most complete line of the very best test equipment in kit form. The combination of careful engineering, complete and detailed instruction manuals, the use of highest quality components, and the exacting machine work in the forming and punching of panels and chassis all go together to produce accurate and dependable test equipment which is a pleasure to construct and truly professional in appearance.

The advantages of kit form test equipment are numerous. The builder saves a major portion of the cost of ready-constructed equipment when he does the assembly himself, and while building, becomes better acquainted with the circuitry and operation of the unit thereby gaining that important knowledge which will help him use the instrument far more intelligently and over a wider range of applications. Moreover, should maintenance or repair ever be needed, the knowledge gained in construction will permit the builder to easily put the unit back into good operating condition.

We would like to stress one point—it always has been, and it always shall be, our sincere desire to produce the best kit form test equipment at low cost to customer. And furthermore, we stand ready to help the Heathkit user in any way, and at all times, for we want every Heathkit owner to receive the many years of excellent operation for which his kit was engineered.



ALL SALES DIRECT

All sales are made directly between the Heath Company and you, the customer. We make only direct sales principally for three reasons:

First: Reduced cost to customer—Direct sales completely eliminate all costs, commissions, and markups due to salesmen, representatives, distributors and jobbers. We realize the important place distributors have in the radio industry and naturally have no objections to them, but, by selling all Heathkits direct, we are able to eliminate all middle men . . . this savings can be passed right on to the customer and reflects itself in higher quality instruments at lower cost.

Second: Better instruments—A direct contact with the customer lets us know exactly what engineers, service men, hams, schools and experimenters need and want. By knowing these needs, and benefiting from customer comments and suggestions, we can not only produce the kind of equipment that is desired, but we can incorporate those features which will make the instruments more useful and versatile.

Third: Better service—By dealing directly, we can serve the customer both before and after a sale is made. We can give him straightforward and first-hand information about any kit before he buys it. And after a kit is purchased, should the owner want any technical help concerning the instrument or its construction, he can call directly on us—he can immediately enjoy the benefits of our technical consultation, engineering, and service departments.

Heathkit R. F. PROBE KIT

No. 309

$5.50

SHIP. WT. 2 LB.

The RF Probe Kit comes complete with probe housing, 1N34 crystal diode detector, connector, lead and plug and all other parts, plus clear assembly instructions. Extends range of Heathkit VTVM to 250 Mc. ± 10%. Works on any 11 megohm input VTVM.

Heathkit 30,000 V. DC PROBE KIT

No. 336

$5.50

SHIP. WT. 2 LBS.

For TV service work and all other high voltage applications. Sleek looking. Two color molded plastic—red body and guard, and jet black handle. Designed to plug into Heathkit VTVM so that the 300V scale is conveniently multiplied by 100. Can be used with any standard 11 Megohm VTVM.

Heathkit SCOPE DEMODULATOR PROBE KIT

No. 337

$4.50

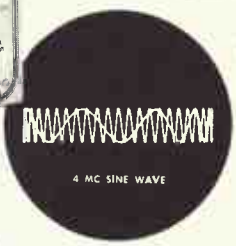
SHIP. WT. 1 LB.

Because of continued requests from our customers for such an item, we have developed a demodulator probe kit for use with the oscilloscope. Probe kit consists of probe housing, crystal diode detector, shielded cable and two spade lugs for making connection to oscilloscope input.

Heathkit 5" PUSH-PULL . . O-7 OSCILLOSCOPE KIT

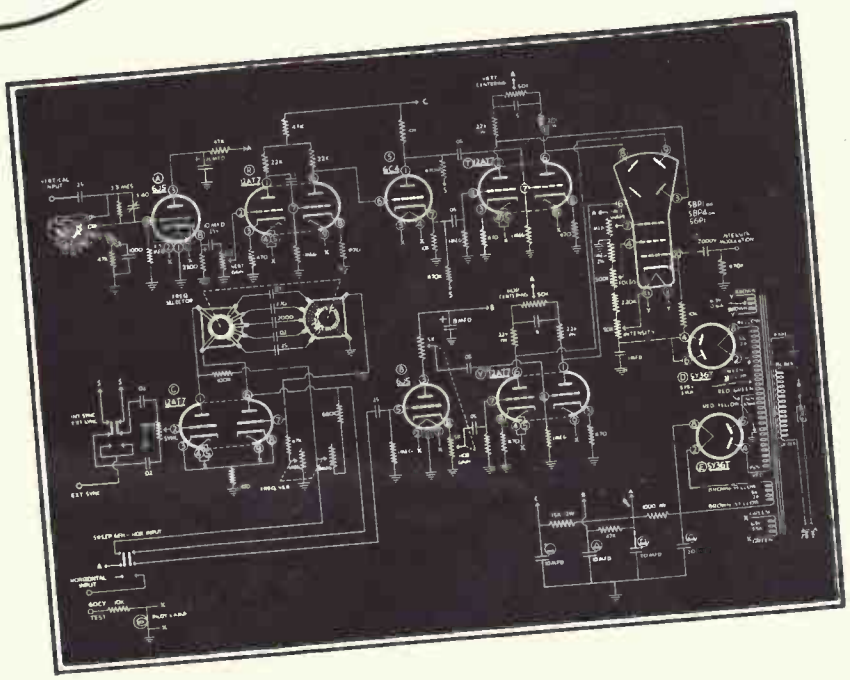
MODEL O-7
SHIPPING WEIGHT 29 LBS.

$43.50



Features

- New "spot shape" control for spot adjustment — to give really sharp focusing.
- A total of ten tubes including CR tube and five miniatures.
- Cascaded vertical amplifiers followed by phase splitter and balanced push-pull deflection amplifiers.
- Greatly reduced retrace time.
- Step attenuated — frequency compensated — cathode follower vertical input.
- Low impedance vertical gain control for minimum distortion.
- New mounting of phase splitter and deflection amplifier tubes near CR tube base.
- Greatly simplified wiring layout.
- Increased frequency response — useful to 5 Mc.
- Tremendous sensitivity .03V RMS per inch Vertical — .6V RMS per inch Horizontal.
- Dual control in vernier sweep frequency circuit — smoother acting.
- Positive or negative peak internal synchronization.



SPECIFICATIONS

Vertical:
Frequency response . . . . . +2 db at 10 cy.
(1 inch deflection at 1 kc reference) −2 db at 200 kc
−6 db at 500 kc
−12 db at 1 mc
−24 db at 2 mc
Sensitivity (1 inch deflection at 1 kc) .03 volts per inch
Input impedance . . . . . .30 MMF shunting 2 Megohm

Horizontal:
Frequency response . . . . . +2 db at 10 cy.
(1 inch deflection at 1 kc reference) −3 db at 500 kc
−6 db at 1 mc
−12 db at 2 mc
Sensitivity (1 inch deflection at 1 kc) 0.6 volt per inch
Input impedance . . . . . .25 MMF shunting 1 Megohm

Sweep Generator:
Multivibrator with frequency range of 15–100,000 cycles

Tube Complement:
1—5BP1 or 5BP4 or 5GP1 Cathode-ray tube
2—6J5 tubes for horizontal and vertical input
1—6C4 tube for vertical phase splitter
4—12AT7 tubes for horizontal and vertical deflection, cascade amplifier, and multivibrator
2—5Y3 tubes for high and low voltage rectifiers

Power Requirements:
105–125 volts 50–60 cycle AC 70 watts

Dimensions:
8½" wide x 13" high x 17½" deep

USE IT FOR . . .

Observing electrical phenomenon of all kinds . . . audio circuit testing . . . alignment of AM and FM receivers . . . transmitter tests . . . TV serving . . . frequency measurements . . . studying phase relationships . . . null indicator . . . hum tracing . . . electrical measurements work . . . production line testing . . .

A fine new scope with TRULY OUTSTANDING PERFORMANCE. New "spot shape (astigmatism) control assures sharp focus adjustment—New extra-wide CR tube mounting bracket places deflection amplifiers and vertical phase splitter near base of CR tube—keeps wiring capacity to a minimum for increased frequency response . . . these are part of the many, many desirable and important features—check them, and look over the circuit and description carefully—you'll see that this is the best scope value on the market today!

CIRCUIT DESCRIPTION: *The vertical channel* has a step attenuated, frequency compensated, vertical input which feeds a cathode follower stage—this accomplishes improved frequency response, presents a high impedance input, and places the vertical gain control in a low impedance circuit for minimum distortion. Following the cathode follower stage is a twin triode—cascaded amplifiers to contribute to the scope's extremely high sensitivity. Next comes a phase splitter stage which properly drives the push-pull hi-gain, deflection amplifiers (whose plates are directly coupled to the vertical deflection plates). This fine tube lineup and circuitry give a sensitivity of .03V RMS per inch vertical and useful frequency response to 5 MC.

The horizontal channel consists of a triode phase splitter with a dual potentiometer (horizontal gain control) in its plate and cathode circuits for smooth, proper driving of the push-pull horizontal deflection amplifiers. As in the vertical channel, horizontal deflection amplifier plates are direct coupled to the CR tube horizontal deflection plates (for improved frequency response).

The wide range sweep generator circuit incorporates a twin triode multivibrator stage for producing a good saw-tooth sweep frequency (and with faster retrace). Has both coarse and fine frequency controls. Extended sweep range keeps the trace from being confused with the retrace.

Power Supply utilizes specially designed power transformer to keep external electrostatic and electromagnetic fields to a minimum—transformer has internal shield with external ground lead. The supply has both high and low voltage rectifiers and plenty of filtering.

And the scope has internal synchronization which operates on either positive or negative peaks of input signal—Z axis modulation (intensity modulation)—provisions for external synchronization—vertical centering and horizontal centering controls—wide range focus control and an intensity control for giving plenty of trace brilliance.

Comes complete, detailed instruction manual has step-by-step instructions, pictorials, schematic, circuit description and uses of scope. All parts furnished—all tubes (including CR tube), chassis, cabinet, transformer, etc.

YOU SAVE BY ORDERING DIRECT FROM MANUFACTURER

Heathkit A.C. VACUUM TUBE VOLTMETER KIT

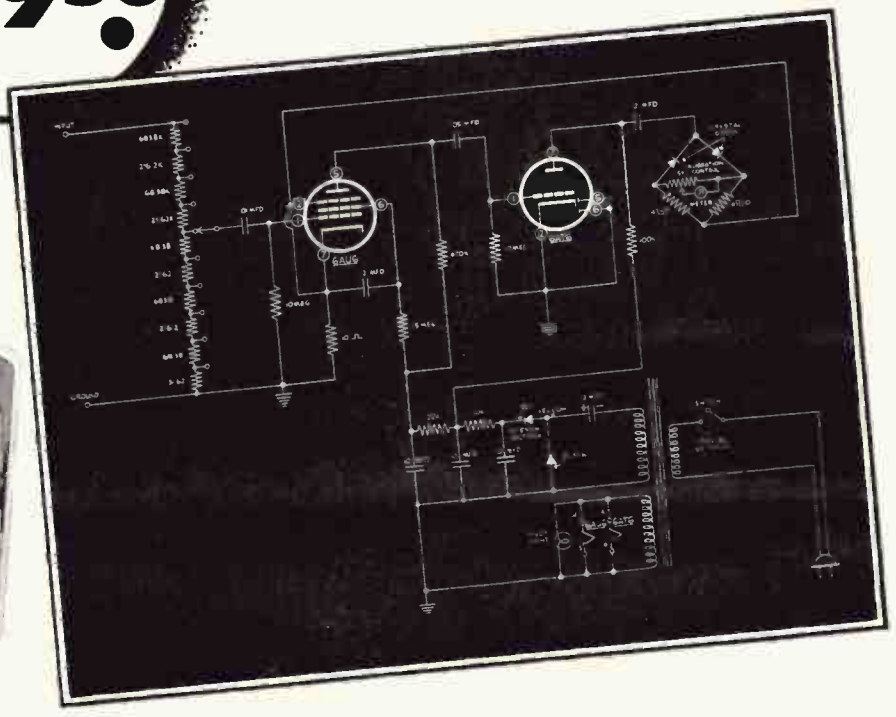
MODEL AV-1

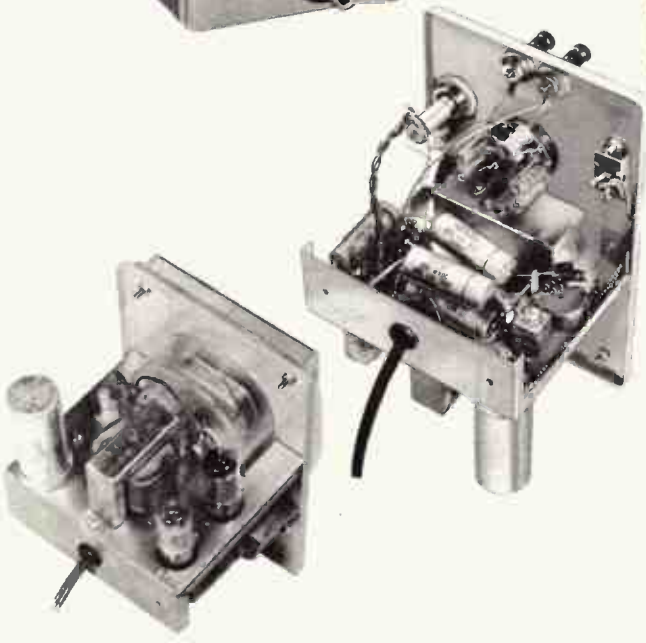
Shipping weight 5 lbs.

$29.50

Features

- Companion piece to V5-A Vacuum Tube Voltmeter.
- Frequency response ± 1 Db from 20 cycles to 50,000 cycles.
- High input impedance — 1 megohm.
- Ten voltage ranges — Lowest .01V RMS full scale, highest 300V RMS full scale.
- Compact size cabinet dimensions only 4⅛" deep x 4 11/16" wide x 7⅜" high.
- Voltage ranges in multiples of 1 and 3. Db ranges in steps of 10 Db.





A new AC VTVM which is especially useful for audio work and laboratory applications . . . extremely low level measurements are easy to take (lowest range, full scale .01V RMS) and higher ranges are covered (highest range, full scale 300V RMS)—Ten voltage ranges in a ratio of 1–3–10 provide for ease of operation and greater accuracy. Note wide DB range covered in Specifications.

Instrument has an excellent frequency response of ±1 DB from 20 to 50,000 cycles and errors due to line voltage changes or variations in tube characteristics are kept to a minimum. Operation kept simple by use of only one control.

The newly designed, three piece, and compact size cabinet has modern styling and is highly professional in appearance. This unit is an excellent companion piece to the V5-A.

A Simpson 200 microampere meter has large, plainly marked, and easy-to-read meter scales. All parts are of highest quality and the kit comes complete with all parts and detailed instruction manual.

CIRCUIT DESCRIPTION: The basic circuit consists of two stages of amplification feeding a modified bridge circuit. AC voltage to be measured is applied across a one megohm voltage divider which provides ten separate meter ranges. Precision resistors used in the divider make it possible for one calibration to serve all ten ranges. Part of the voltage thereby developed is applied to the grid of the first amplifier stage. The first stage of amplification uses a hi-gain pentode as a voltage amplifier and the next stage utilizes a hi-mu triode as a current amplifier to feed the meter circuit. Within the modified bridge circuit, the two crystal diodes rectify the output current, providing a unidirectional current flow through the meter movement.

For calibration purposes, the meter is placed in parallel with a portion of the calibration control connected to the DC terminals of the bridge. This one calibrating resistance serves for all meter ranges. Once adjusted, the meter deflection is proportional to the voltage across the input terminals.

A feedback loop provides the necessary stability and frequency response. It uses the bridge current to develop negative feedback in the cathode circuit of the voltage amplifier. Extra shielding is provided around the meter to prevent unwanted feedback from the meter to the input circuit.

The power supply is transformer operated and utilizes a selenium rectifier and two sections of resistance-capacitance filtering.

SPECIFICATIONS

Power Requirement: 105–125V AC, 50–60 cycles, 10 Watts

Tube Complement: 1—6AU6 1—6AT6

Input Impedance: 1 Megohm at 1 KC

Ranges: .01, .03, .1, .3, 1, 3, 10, 30, 100, 300 V RMS

Decibels: Total range —52 to +52 db, scale —12 to +2 db. (1 MW—600 ohm) ten switch selected ranges from —40 to +50 db.

Physical Specifications: 7⅜" high x 4 11/16" wide x 4⅛" deep

USE IT FOR . . .

AC measurements including those of extremely low level . . . checking gain and determination of frequency characteristics of amplifiers . . . measurement of microphone and phono pickup output . . . output meter . . . mechanical vibration studies . . . study of filter characteristics . . .

YOU SAVE BY ORDERING DIRECT FROM MANUFACTURER

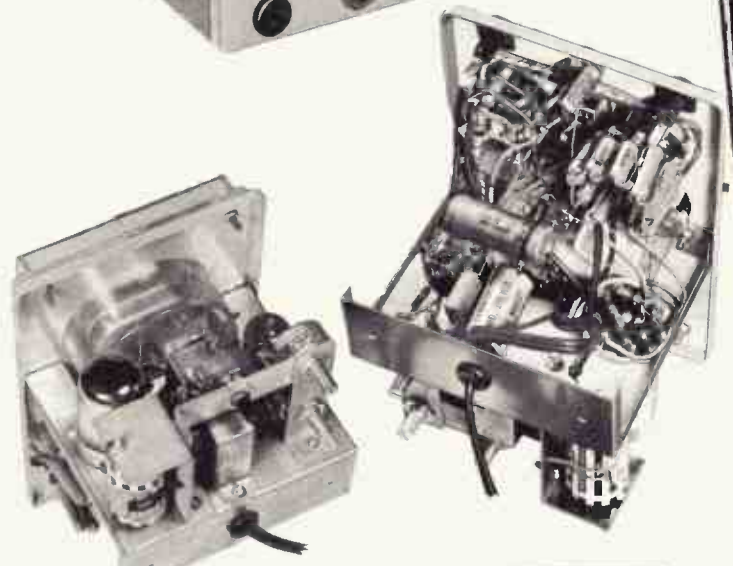
Heathkit VACUUM TUBE VOLTMETER KIT

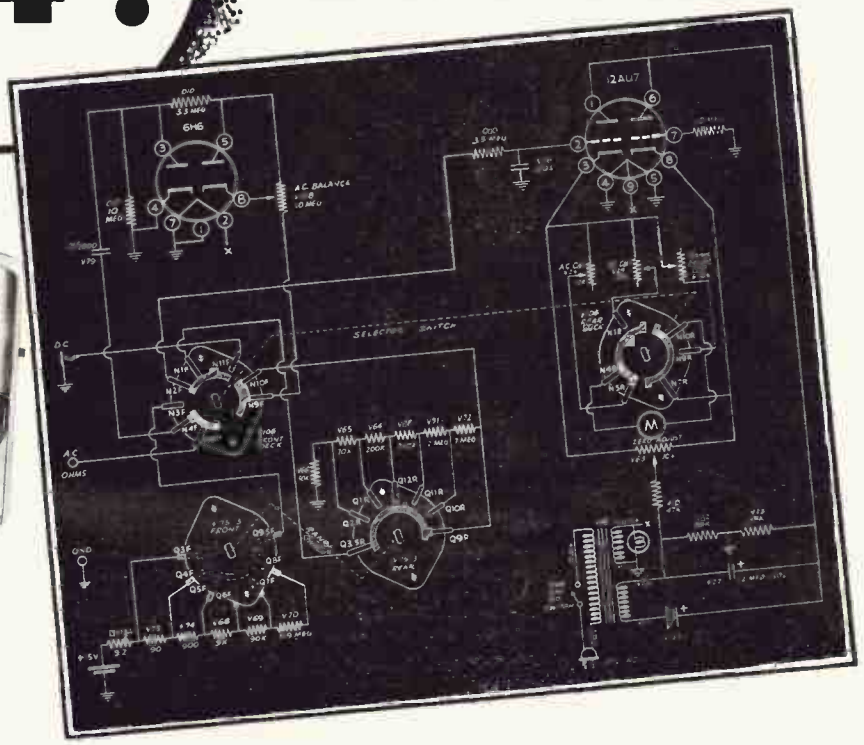
MODEL V-5-A
SHIPPING WT. 7 LBS.

$24.50

Features

- New styling — formed case for beauty.
- New truly compact size. Cabinet 4⅛" deep by 4-11/16" wide by 7⅜" high.
- Quality 200 microamp meter.
- New ohms battery holding clamp and spring clip — assurance of good electrical contact.
- Highest quality precision resistors in multiplier circuit.
- Calibrates on both AC and DC for maximum accuracy.
- Terrific coverage — reads from ½V to 1000V AC, ½V to 1000V DC, and .1 to over 1 billion ohms resistance.
- Large, clearly marked meter scales indicate ohms, AC Volts, DC Volts, and DB — has zero set mark for FM alignment.
- New styling presents attractive and professional appearance.





SPECIFICATIONS

Power Requirements: 105–125V 50/60 Cycle AC, 10 Watts
Cabinet Size: 7⅜" high x 4 11/16" wide x 4⅛" deep
Meter: 4½" Streamlined case with 200 microampere movement
Multipliers: Precision type
Tubes: 1—12AU7 Twin triode meter bridge.
1—6H6 Twin diode AC rectifier
Power Supply: Power transformer and selenium rectifier
Battery: 1½ Volt flashlight cell
D. C. Voltmeter: **6 Ranges:** 0–3, 10, 30, 100, 300, 1,000 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: 3,666,666 ohms per volt on 3 Volt range
Circuit: Balanced bridge (push-pull) using twin triode
Electronic AC Voltmeter: **6 Ranges:** 0–3, 10, 30, 100, 300, 1,000 Volts full scale on linear scales reading R. M. S. (.707 of positive peak)
Circuit: Diode with adjustable compensation
Electronic Ohmmeter: **6 Ranges:** Scale with 10 ohms center x1, x10, x100, x1,000, x10K, x1 Meg. Measures .1 ohm to 1,000 megohms with internal battery

USE IT FOR . . .

Wide range measurement of: DC voltage, AC voltage, resistance . . . FM alignment indicator . . . frequency response measurements . . . radio and TV servicing . . . continuity checks . . . decibel readings . . . output meter . . . maintenance of electrical equipment.

Note the new compact size and smart styling of the 1952 HEATHKIT VTVM. The sturdy and attractive cabinet has a formed front panel and rear cover which fit over recessed flanges of the case to eliminate sharp edges and add greatly to the over-all appearance—Only 4⅛" deep x 4⅛" wide x 7⅜" high, yet not crowded.

Be sure to check the specifications—note the extremely wide range of coverage. Instrument reads from ½V to 1000V DC, ½V to 1000V AC, .1 to over 1 billion ohms resistance, and Db. Has mid-scale zero set marking for FM alignment. Selector switch on front panel sets up instrument for taking DC+V, DC—V, AC V, and ohms.

The extra large meter scales are plainly marked—DB scale in red for quick identification—all other scales a sharp, crisp black for easy and fast readings. Quality Simpson meter movement of 200 microampere sensitivity combined with 1% precision resistors in multiplier circuit are important contributing factors to the accurate and dependable readings obtainable.

CIRCUIT DESCRIPTION: The vacuum tube voltmeter has many advantages over the non-electronic volt-ohmmeter. 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 grid circuits, and AVC networks. It prevents circuit "loading."

The meter is in the cathode circuits of a twin triode. The zero adjust control sets up a balance between the two sections of the triode such that with zero input voltage applied to the first grid, the voltage drop across each portion of the adjust control (from adjust arm to one side, and adjust arm to the other side) is the same. This being true, the meter reads zero. With a voltage applied to the first grid, the balance in the cathode circuits is upset and the meter indicates. The relationship between the test voltage applied to the first grid and the meter indicating current is linear, and therefore the meter is calibrated with a linear scale. The advantage of having the meter in a vacuum tube circuit of this kind is that voltages to be measured are not applied directly to the meter but rather to the tube. Because the tube is limited to the amount of current it can draw, the meter movement is protected.

Calibration of the instrument is simple and is accomplished by 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.

The maximum test voltage which is applied to the 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.

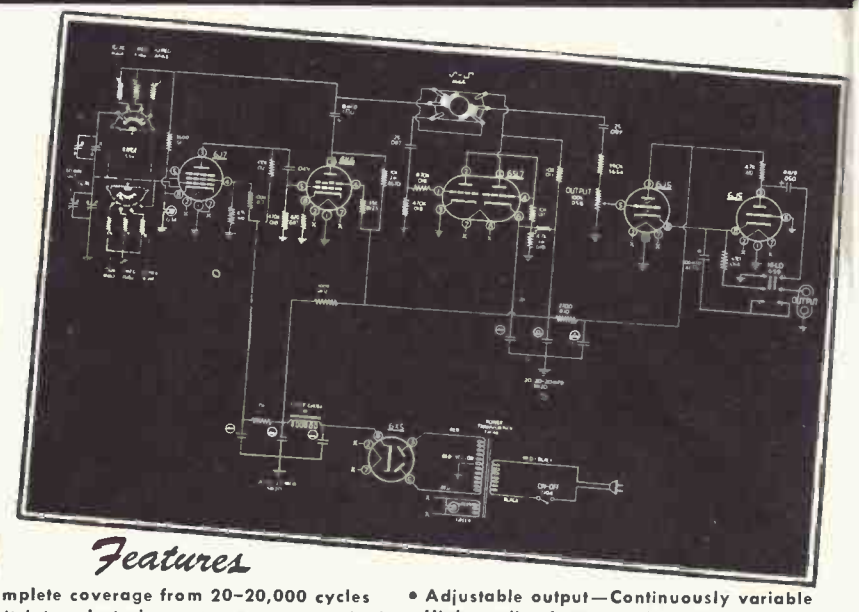
For AC voltages in the audio frequency range, a shunt diode is used to provide a DC voltage proportional to the peak of the applied AC voltage. This DC voltage is applied through a voltage divider to the twin triode causing the meter to indicate.

For resistance measurements, a 1½ 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.

Assembly is really easy with the detailed instruction manual telling exactly how to build the kit. All parts included—transformer, meter, leads, cabinet, etc.

YOU SAVE BY ORDERING DIRECT FROM MANUFACTURER

Heathkit SINE & SQUARE WAVE AUDIO GENERATOR KIT



Model AG-7
Shipping Wt. 15 lbs.

$34.50

SPECIFICATIONS

Output Frequency: 20–20,000 cycles

Output Voltage at 1% Distortion: 1 volt across 10,000 ohms
5 volt across 33,000 ohms
10 volt across 100,000 ohms
5 volt across 500 ohms
1.0 volt across 1,000 ohms
1.5 volt across 2,000 ohms

Square Wave Range: 60 cycles (5% tilt) to 6,000 cycles (5% round off)

Generator Impedance: HI: 15,000 ohms LO: 700 ohms

Power Requirements: 105–125 volts 50/60 cycle, 30 watts

Dimensions: 7½" high x 13¼" wide x 7½ deep

USE IT FOR . . .

Audio frequency source . . . square wave testing . . . audio circuit study . . . loudspeaker response testing . . . audio amplifier design . . . AC bridge external generator . . . audio filter and network study . . .

Features

- Complete coverage from 20–20,000 cycles
- Adjustable output—Continuously variable
- Switch to select sine or square wave output
- High quality 4 gang tuning condenser
- Range switch with X1, X10, X100 positions for simplified frequency settings
- Choice of either high or low output impedance operation

Designed with versatility, usefulness, and dependability in mind, the AG-7 gives you the two most needed wave shapes right at your fingertips—the sine wave and the square wave.

The range switch and plainly calibrated frequency scale give rapid and easy frequency selection, and the output control permits setting the output to any desired level. A high-low impedance switch sets the instrument for either high or low impedance output as described below. Coverage is from 20 to 20,000 cycles, and distortion is at a minimum.

CIRCUIT DESCRIPTION: The circuit consists of three main sections: oscillator, clipper, and amplifier. The oscillator section is comprised of two stages, resistance coupled, and with both positive and negative feedback. Positive feedback is applied through a special network of resistances and capacitances which determine the oscillator frequency. The negative feedback is used to stabilize the operation of the circuit.

The square wave is generated by feeding the sine wave output from the oscillator into a clipper circuit.

The output from the oscillator is fed either through the clipper or directly into the output amplifier. This amplifier isolates the oscillator from the external load. The signal is passed through a gain control (Output Control) into the grid of a triode cathode follower. For low impedance output, the cathode resistor is bypassed and the low impedance (500-600 ohm) transformer primary winding of the equipment under test forms the load impedance for the cathode follower. For high impedance output (10,000 ohms and up), the cathode resistor is not bypassed, and drives a grounded grid triode amplifier. The output from the plate circuit is then available at the output terminals.

Heathkit HANDITESTER KIT

SPECIFICATIONS

Range DC Volts: Full scale 10—30—300—1,000 and 5,000 Volts

Range AC Volts: Full scale 10—30—300—1,000 and 5,000 Volts

Range Ohmmeter: 0–3,000 Ohms, 30 Ohms Center
0–300,000 Ohms, 3,000 Ohms Center

Range Milliamperes: 0–10 MA 0–100 MA

Meter Movement: 400 Microampere 3"

AC Rectifier: Bradley dual half wave

Accuracy: 1% divider and calibrating resistors provided
Meter movement 2% of full scale

Case: Streamline Bakelite

Ohmmeter Battery: Burgess No. 1 Unicell Flashlight Battery

USE IT FOR . . .

Radio service house calls . . . checking car, boat, or airplane ignition systems for shorts, battery voltage, etc. . . . checking 110 and 220 house wiring . . . resistance, DC current, AC voltage, DC voltage measurements . . . general appliance testing . . .

The Handitester is a compact unit designed to conveniently read up to 5000V AC, 5000V DC, up to 300,000 ohms, and currents to 100 milliamperes. The ranges decade and are arranged (See Specifications) so that good reading accuracy is obtained.

The instrument uses a 400 microampere meter movement which is shunted with resistors to provide a uniform 1 milliampere load on both AC and DC ranges. This allows the use of but one set of divider resistors on both AC and DC and provides a simplicity of switching which is handled with only one switch—there are no separate AC–DC switches to forget.

The AC rectifier circuit uses a high quality Bradley rectifier in a dual half-wave hookup. The dual half-wave type was chosen because of its excellent linear characteristics. A comparison of the red AC scale with black DC scale shows this.

The ohmmeter uses a 1½ volt internal battery in series with the unknown resistance. The low range is obtained by shunting the meter circuit with a known low resistance.

The milliampere ranges are obtained by shunting the basic meter movement with the proper shunts. The meter is provided with a hairline type pointer which can be read with maximum accuracy

$13.50

Model M-1
Shipping Wt. 3 lbs.

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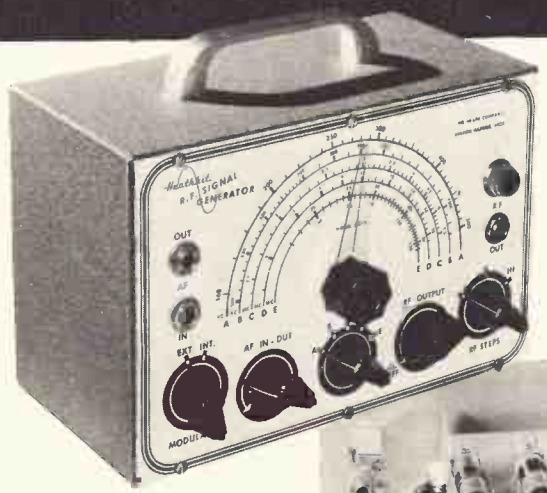
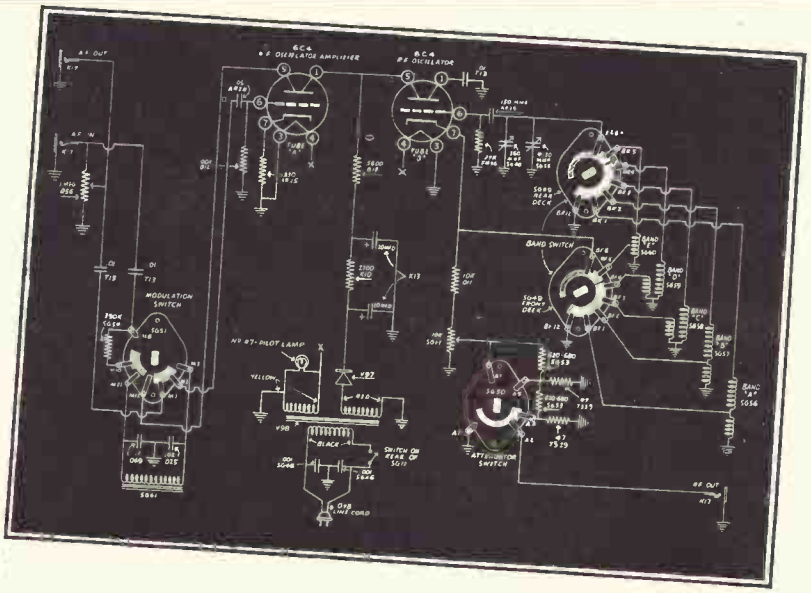
Heathkit MODEL SG-6 SIGNAL GENERATOR KIT



$19.50

Model SG-6
Shipping Wt. 7 lbs.



SPECIFICATIONS

Frequency Range: Band A—160 Kc to 510 Kc
Band B—500 Kc to 1.650 Kc
Band C—1.65 Mc to 5.7 Mc
Band D—5.4 Mc to 19 Mc
Band E—17 Mc to 50 Mc
Calibrated Harmonics—51 Mc to 150 Mc

Radio Frequency Output: In excess of 100,000 microvolts

Modulation Frequency: Approximately 400 cycles

Audio Output: 1½ to 2 Volts

Audio Frequency Input: Approximately 5 V across 1 Megohm

Tubes: 6C4 RF Oscillator
6C4 Audio Oscillator or Audio Amplifier

Power Requirements: 105–125 V 50/60 cycles

USE IT FOR . . .

An RF signal source, modulated or unmodulated, for radio repair, laboratory work, experimental testing . . . 400 cycle sine wave audio testing . . . checking RF stages . . . alignment of both AM and FM IF stages . . . marker generator for TV alignment . . .

Features

- Step attenuated RF output.
- Turret Coil sub assembly.
- Pre-calibrated and adjusted coils.
- Vernier tuning of 6 to 1 ratio.
- Both AF input and AF output adjusted by the SAME control.
- Miniature HF tubes for ease in handling high frequencies.
- Convenient source of 400 cycles sine wave audio output.
- Complete coverage as bands are changed.
- Unmodulated or 400 cycle modulated RF output.
- Extended range of 160 KC to 50 MC on fundamentals and up to 150 MC on useful calibrated harmonics.

Useful and practical are the by-words of the SG-6. To cover all the desirable RF ranges, the instrument covers from 160 KC to 50 MC on fundamentals and up to 150 MC on useful calibrated harmonics. The RF output can be 400 cycle modulated, or unmodulated as desired. In addition, the generator will act as a source of 400 cycle sine wave audio output. All RF oscillator coils are precision wound and adjusted to calibration before shipment, thereby assuring maximum accuracy. The coils, bandswitch, and tuning condenser all mount as a turret assembly so as to offer the advantage of short wiring leads and easy mounting of parts. To prevent tuning past a desired RF output signal when operating the generator, the tuning condenser has a vernier drive of 6 to 1 ratio.

CIRCUIT DESCRIPTION: The main tuning condenser varies the capacitance in a Hartley oscillator thus giving the RF band coverage. Individual bands are selected by means of the bandswitch which connects any one of 5 coils into the circuit.

The Audio Oscillator is a Colpitts oscillator which produces approximately a 400 cycle sine wave. This audio frequency can be used to modulate the RF output if desired or as a source of audio for test purposes. The 6C4 tube in the audio oscillator circuit acts as an audio amplifier if external modulation is used. This design feature permits external modulation of small signal strength from a high impedance source and thereby increases the usefulness of the instrument.

The RF output circuit is of low impedance. This is accomplished by the use of cathode coupling to the output jack. The level of RF output is varied by means of the RF steps switch and the RF output control.

Heathkit ELECTRONIC SWITCH KIT

SPECIFICATIONS

Input Voltage: 110–125 V AC, 50–60 cycles

Power Consumption: 25 Watts

Tube Complement: 1—6X5 (GT) Rectifier
1—6SN7 (GT) Multivibrator
1—6SN7 (GT) Blocking Tube
1—6SH7 (GT) or 6SJ7 (GT) A Amplifier
1—6SH7 (GT) or 6SJ7 (GT) B Amplifier

Control Line Up: Gain A Control — Coarse Frequency Control
Gain B Control — Fine Frequency Control
Position Control

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.

Physical Specifications: 10½" deep x 5⅝" wide x 6⅝" high

USE IT FOR . . .

Greatly increasing usefulness of an oscilloscope by comparing two separate traces—study of phase shift, distortion, clipping . . . square wave generator over the switching range . . .

An electronic switch is used in conjunction with an oscilloscope so that two different signals can be simultaneously studied as separate traces. One signal is fed into channel A of the switch, a second signal fed into channel B, and both signals are studied with a scope. For example; both the input and the output of an amplifier can be seen at the same time. The traces can be separated or superimposed. A gain control for each channel permits adjusting each trace to a convenient amplitude. Switching accomplished electronically, and coarse and fine frequency controls adjust the switching rate from less than 10 cps to over 2000 cps in 3 overlapping ranges.

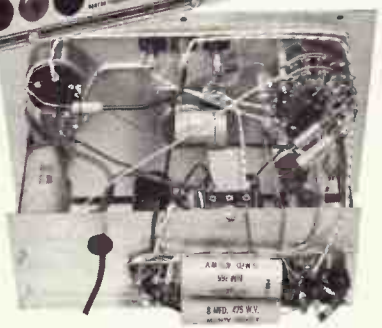
Get maximum and added use from your scope by owning an electronic switch.

Model S-2
Shipping Wt. 11 lbs.

$19.50

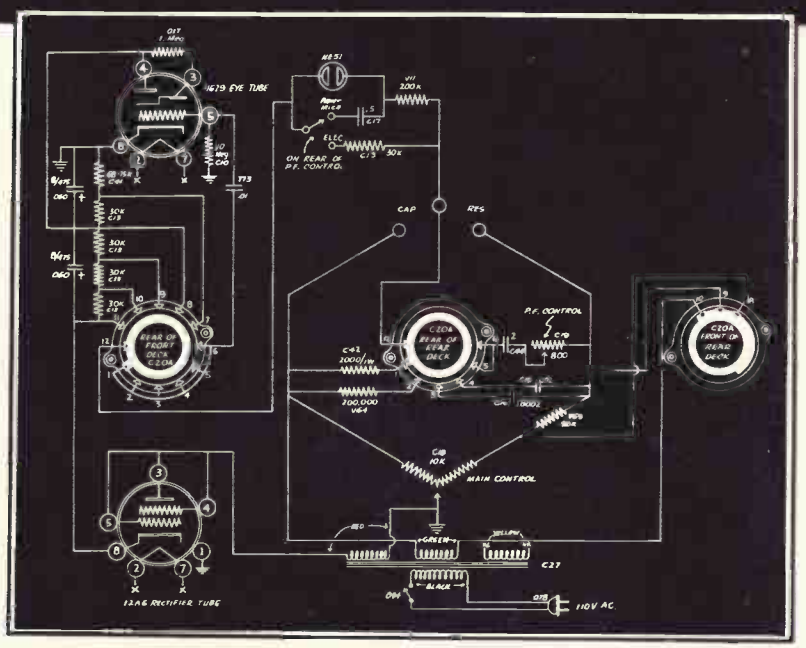
YOU SAVE BY ORDERING DIRECT FROM MANUFACTURER

Heathkit MODEL C-2 CONDENSER CHECKER KIT



Model C-2
Shipping Wt 7 lbs.

$19.50



SPECIFICATIONS

Capacity Measurement: .00001 MFD to 1000 MFD
Resistance Measurement: 100 Ohms to 5 Megohms
Tube Complement: 12A6 Rectifier
1629 Magic Eye
Polarizing Voltage: 20–500V in 5 steps
PF Measurement: 0–50%
Power Requirement: 110–125V, 60 cycle AC

USE IT FOR . . .

Measuring capacitance of paper, mica, electrolytic and ceramic condensers . . . reading Power Factor of electrolytic condensers . . . applying polarizing voltage for condenser leakage and short tests . . . measuring value of resistors . . . finding value of unmarked resistors and condensers . . .

Features

- Magic eye indicator
- Checks paper-mica-ceramic-electrolytic condensers
- Power Transformer operated
- Leakage test for condensers
- Measures either resistance or capacitance
- No charts or multipliers necessary
- Has power factor scale

This condenser checker is a real pleasure to operate since all condenser values are direct reading on the large, clearly marked front panel scales. All the desirable condenser ranges are covered (.00001 Mfd to 1000 Mfd) as well as resistance measurements from 100 ohms to 5 megohms. Note that paper, mica, ceramic, or electrolytics can be checked. For dependable measurements, the Heathkit Condenser Checker is tops.

CIRCUIT DESCRIPTION: Fundamentally, an AC powered bridge circuit is formed for both resistive and capacitive measurements. The main control varies the resistance in two arms and the third arm (in resistive measurements) consists of either of two resistors, one of which is 100 times larger than the other. Thus the coverage is obtained as outlined in the SPECIFICATIONS. The fourth arm is the unknown resistance.

For capacitive measurements, the main control varies the resistance in two arms, the third arm consists of any one of three known condensers, and the fourth arm is the unknown condenser. The high capacity end of the dial is extended by means of an added resistance placed on one side of the main control resistance.

Electrolytic condensers frequently have a certain amount of internal resistance in series with the capacity. To balance the bridge, it is necessary to balance such resistance with resistance in series with the standard condenser (power factor control). As electrolytic condensers are only found in the higher capacity values, the control only functions on the high and extended ranges.

The leakage test places a test voltage on the condenser through a neon bulb circuit. Leakage is indicated by rapid flashing or a steady glow.

The AC power to the bridge is supplied by a winding on the secondary of the power transformer. Indication of balance (null) is by means of a magic eye tube. At balance, the eye is maximum open.

The operating voltages are obtained by means of the power transformer and half-wave rectifier circuit.

Heathkit MODEL T-2 SIGNAL TRACER AND UNIVERSAL TEST SPEAKER KIT

Features

- Thirty different impedance ratios for speaker matching
- Extremely high sensitivity
- Test speaker included
- Tests either single ended or push-pull stages
- Power transformer operated—safe for checking AC-DC receivers
- Has provisions to test speakers
- Checks sets not having an output transformer or speaker
- Has crystal diode test prod

$19.50

Model T-2
Shipping Wt. 8 lbs.

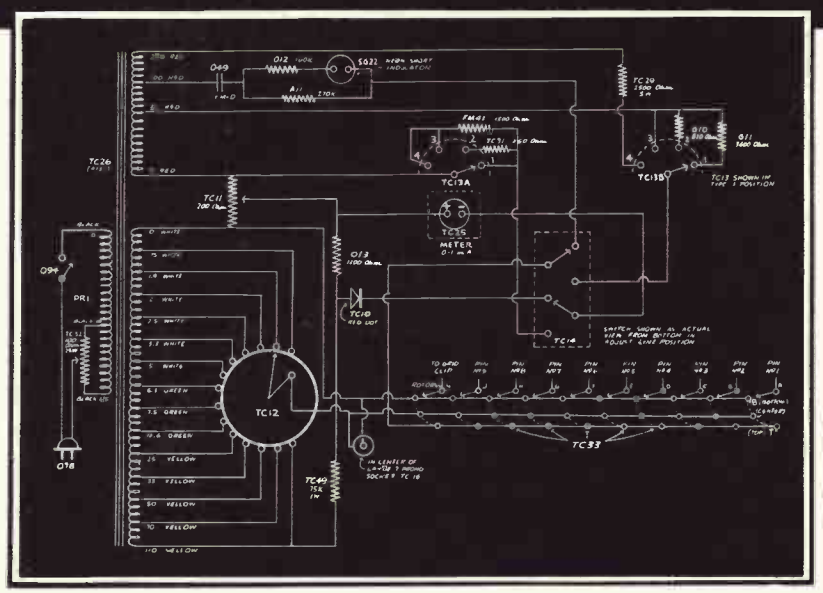
By using this signal tracer, a stage not operating properly can be immediately identified and the trouble easily isolated. The gain of each stage under test is indicated by the amount the gain of the tracer must be reduced to maintain an equal volume. The tracer has the advantage of being able to trace a signal from the antenna coil clear through to the speaker. The method of tracing is simple and is clearly explained in the construction manual. Receivers and amplifiers under test which do not have an output transformer or speaker present no problem, as the tracer has jacks to conveniently connect to the tracer's own output transformer and speaker. These connections will operate from either single ended or push-pull stages, and THIRTY different impedance ratios for matching is possible. Moreover, the tracer has provisions to check an external speaker.

CIRCUIT DESCRIPTION: The circuit consists of a 6SH7 Hi-gain amplifier, a 6K6 output stage, and a 6X5 connected for full wave rectification in the power supply. In the test probe is a 1N34 crystal diode which is in effect a crystal detector which will respond to any frequency up to approximately 200 megacycles; and when testing stage by stage, the test probe feeds the signal into the high gain amplifier. The signal is then further amplified by the output stage and from the output transformer is heard through the test speaker, or if desired, observed by voltmeter indication. Voltmeter connections are available on front panel. (Voltmeter not included.)

USE IT FOR . . .

Efficiently locating bad or weak receiver stages in radio repair work . . . signal tracing including RF, IF, and audio sections . . . checking either single ended or push-pull output stages . . . speaker substitution . . . convenient audio system for checking record changers . . . observing gain or loss of amplifier stages . . .

Heathkit
MODEL TC-1 TUBE CHECKER KIT



Model TC-1
Shipping Wt. 12 lbs.

$29.50

Features

- Truly simplified switching arrangement
- Gear driven roller chart which gives instant set-up for all types
- Sockets for every modern tube—blank for new types
- Beautiful 3 color meter—reads good-bad and line set point
- Rugged counter type birch cabinet
- Complete protection against obsolescence
- Has line set control and meter line set indication
- Checks for emission, shorted elements, open elements, and filament continuity

Tube checking can be fast, easy, and sure with a Heathkit Tube Checker. The free-acting, gear-driven roll chart listing hundreds of tubes allows for the rapid set-ups. Simplified switching gives not only fast, but dependable checks. Checks the individual elements—checks for opens—checks for shorts—checks for quality—checks for filament continuity. The panel has sockets for 4, 5, 6, and 7 prong tubes, octals, loctals, 7 prong miniatures, 9 prong miniatures, 5 prong Hytron type, a blank for new tubes of the future, and provisions for pilot lamp checking. New type tubes can be set up without waiting for factory data—protection against obsolescence. The meter scale has a line-set mark, and large BAD—?—GOOD three color marking for easy reading.

CIRCUIT DESCRIPTION: One secondary winding of the power transformer is tapped for 14 different voltages which run all the way from .75V up to 110V. Such an arrangement assures placing the proper filament voltages on the hundreds of tubes listed on the chart, and the filament switch makes proper connections.

The other secondary winding has voltage taps of 30V, 100V, and 250V, and the various tests use these different voltages. Three basic circuits are set up as the tube is checked and these operate as explained below. The first basic circuit is used when making the quality and open checks. In these tests, 30V AC are placed across the tube between filament and plate, and the tube under test conducts as a half wave rectifier. The filament and cathode are connected together as are the plate and the grids. The plate adjust control adjusts the sensitivity of the BAD—GOOD meter which is in the circuit at this 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 the 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 into the ? or BAD section. Thus, the cathode emission is checked. Basically, the open check works as follows: the plate and all grids connected together will receive a certain amount of electrons from the cathode. The meter reading with this flow is noted. Then, to test each element individually for opens, each of the grids is in turn disconnected, and if the element is not open, the current through the meter drops, and the reading is less than originally noted. If an element is open, it is recognized because the meter reading does not drop when this element is checked. For tubes with quite a number of grids, the operation is somewhat more complex but the above theory applies in general. For gas tubes (OZ4, etc.) the 250V tap rather than the 30V tap is used. The circuitry is the same however.

The second basic circuit is used in the short and filament continuity tests. The 100V tap is connected to the neon bulb short indicator and associated network, and is in series with the plate of the tube being tested. The meter is not now in the circuit, and the checks are indicated by the neon bulb. Putting the switches in the positions as indicated on the roll chart connect the various tube elements in such a manner that a shorted element will cause considerable increased current flow through the resistor in parallel with the neon bulb; the voltage drop then produced reaches the break down voltage of the neon bulb, and it glows brightly indicating a short. For the filament and filament tap continuity test, the filament setting is reduced to .75V, and with continuity, the neon bulb will glow.

The third basic circuit is in the "line set" position. The "line set" control in the primary of the power transformer varies the voltage across the primary, and thereby in turn the secondary voltage. The meter, with the voltage divider network and the rectifier now in the circuit, will indicate the proper secondary voltage when the needle is set on the line set marking. The purpose of the line-set is to assure proper voltages on the tube under test rather than have false indications as a result of high or low power line voltages.

Heathkit
TV PICTURE TUBE TEST ADAPTER

$4.50

No. 355

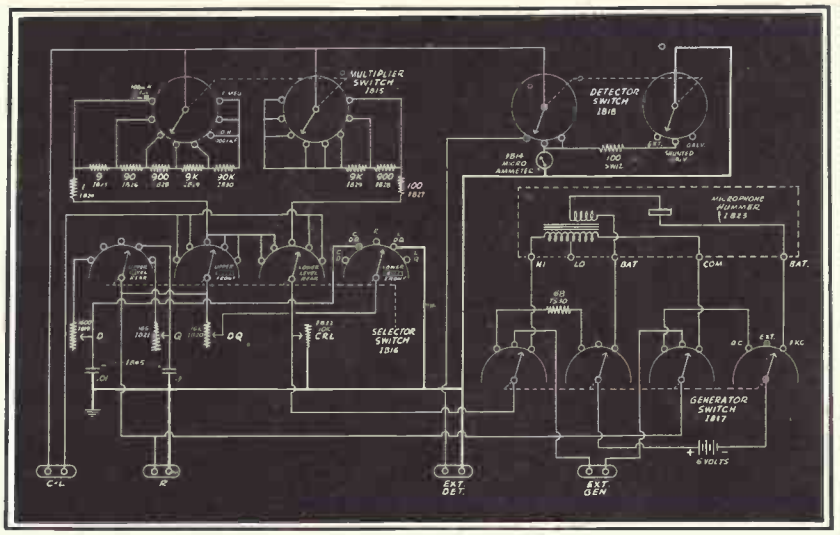
SHIP. WT. 2 LBS.

With this new Adaptor, you can check TV picture tubes on your Heathkit Tube Checker. Adaptor consists of a standard 12 pin TV tube socket, 4 feet of conductor cable and octal plug-in connector. The TV tube need not even be taken out of the set — 4 feet of cable provides ample room for connections between TV tube base and tube checker. Easy to use — set up the tube checker from instructions furnished with kit, connect adaptor between checker and TV tube base, and take the readings!!!! Checks picture tube for emission and shorts. A good way to show your customer the condition of his TV tube as well as determine it for yourself.

Heathkit MODEL IB-1B
IMPEDANCE BRIDGE KIT

Model IB-1B
Shipping Wt. 15 lbs.

$69.50



SPECIFICATIONS

Circuit: 4 Arm Impedance Bridge

D. C. Measurements: 6 Volt Burgess Battery No. F4BP

A. C. Measurements: GR 1,000 cycle hummer. Other frequencies can be used by connecting an external generator.

Resistance: 10 milliohm to 10 megohm

Capacitance: 10 micromicrofarad to 100 microfarad

Inductance: 10 microhenry to 100 henries

Dissipation Factor: .002 to 1

Storage Factor (Q): 1 to 1,000

Accuracy: ½ of 1% decade resistors are used. The accuracy is limited more by the interpretation of the scales and workmanship of assembly. The following is considered normal:

Resistance ±3%
Capacitance ±3%
Inductance ±10%
Dissipation Factor ±20%
Storage Factor ±20%
The accuracy will fall off at the extreme outer limits.

Dimensions: 7⅞" high x 10" wide x 16" long.

USE IT FOR . . .

Measuring AC and DC resistance value of resistors . . . determination of condenser capacitance and dissipation factor . . . finding coil inductance and storage factor (Q) . . . electrical measurements work . . . determining value of unmarked components . . .checking samples . . .

Features

- **High quality G-R 1000 cycle hummer**
- **Choice of Wheatstone, Capacitance comparison, Maxwell, Hay circuits**
- **Measures: Resistance to DC.....Resistance to AC at 1000 CPS**
  Inductance with Low Q.....Inductance with High Q
  Capacitance with Low D.....Capacitance with High D
- **200 microamp zero center galvanometer**
- **Provisions for external generator**
- **Self powered for DC measurements and AC measurements at 1000 cycles**
- **Polished birch cabinet**
- **Large reading scales**

The Heathkit Impedance Bridge is a self powered 4 arm bridge designed especially for use in laboratories, service shops and schools.

CIRCUIT DESCRIPTION: DC resistance is measured by a Wheatstone Bridge powered by a 6V internal battery. Indication of balance is by means of a 200 microamp zero center galvanometer. For galvanometer protection, a shunt position is provided, and for sensitive balance the shunt is thrown out of the circuit.

A high quality and extremely accurate 1000 cycle hummer acts as an AC generator for the inductive and capacitive measurements. Inductance of low Q coils is measured with a Maxwell circuit, and high Q coil measurements utilize a Hay circuit. Capacity measurements are made on a capacitive comparison bridge circuit. Balance is indicated by adjusting the bridge for "null" in a set of headphones. (Headphones not furnished.) The 1000 cycle hummer is powered by the internal 6V battery. The various bridge circuits used measure resistance, capacitance, inductance, dissipation factor (D), and storage factor (Q). See specifications for ranges of measurements.

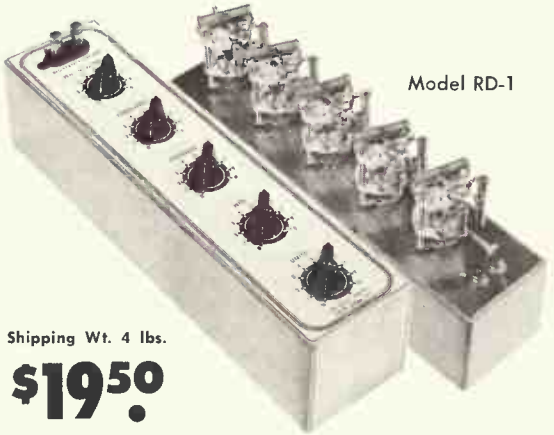
Heathkit LABORATORY RESISTANCE DECADE KIT

The Heathkit Resistance Decade Kit is widely used by schools, experimenters, and laboratories because of the extremely wide resistance range it covers, the rugged and dependable service it gives, and the truly high quality components which make up the unit—plus, such low cost.

The resistance decade kit finds great use in many applications—as a known in bridge circuits, for ohmmeter calibration purposes, in the selection of proper meter multipliers, for experimentally determining proper resistors in radio circuits, and general laboratory work.

The unit consists mainly of five, rotary, two deck switches and twenty precision resistors which, when properly wired in the circuit, will set up a resistance of **1 to 99,999 ohms in ONE OHM STEPS.**

Components are of highest quality . . . ceramic wafer and positive detent switches, and special ceramic body ½% precision resistors with extremely good non-inductive properties.



Model RD-1

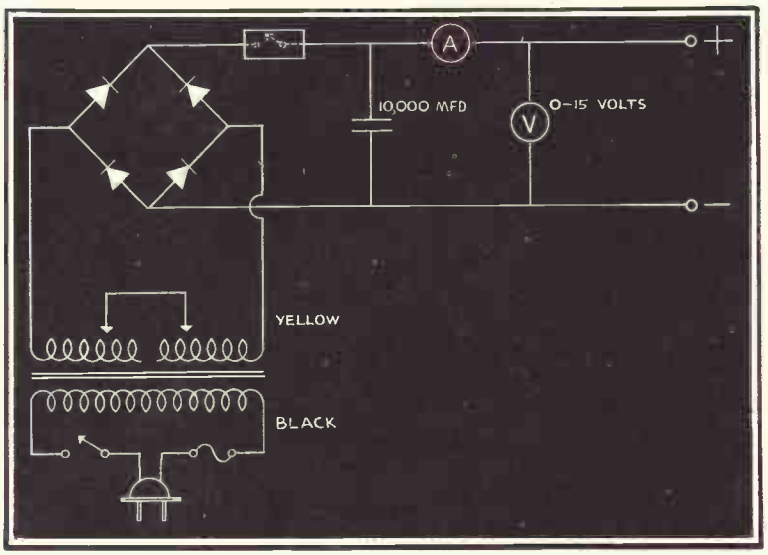
Shipping Wt. 4 lbs.

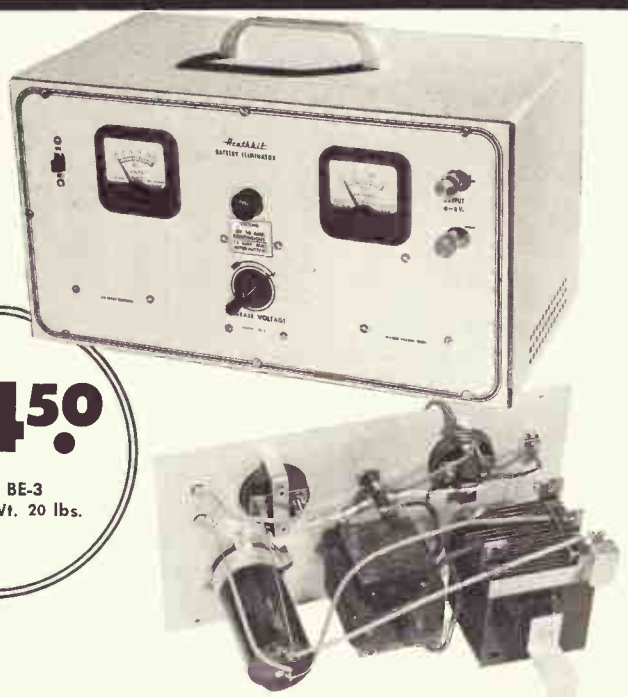
$19.50

YOU SAVE BY ORDERING DIRECT FROM MANUFACTURER

NEW 1952 *Heathkit*

BATTERY ELIMINATOR KIT





$24.50

Model BE-3
Shipping Wt. 20 lbs.

Features

- Can be used as battery charger.
- Continuously variable output 0-8 Volts.
- Heavy duty Mallory 17 disk type magnesium copper sulfide rectifier.
- Automatic overload relay for maximum protection. Self-resetting type.
- Voltmeter and Ammeter to read both voltage and amperage continually—no switching.

A brand new BE-3 kit with new improvements—two meters for continuously reading both voltage and current outputs—new transformer with wiper type contact which smoothly varies useful secondary turns for easy adjustment of voltage output (0–8V). New Mallory husky 17 plate rectifier and Mallory 10,000 MFD filter condenser. Double fuse protection—fuse in primary to protect house line and self-resetting overload switch in output circuit to offer protection to the Eliminator.

Wide range of voltage and current outputs for repairing car radios. Also can be used to charge storage batteries. Output ratings: 6V—10 Amp. continuous, 15 Amp. maximum intermittent.

Comes complete with all parts—cabinet, meters, rectifier, etc. and has step-by-step construction manual. Simple to build, and every shop needs one.

CIRCUIT DESCRIPTION: The AC voltage input is fed into the primary of the transformer. (A 3 Amp. fuse offers protection to the AC supply circuit.) The secondary of the transformer is so wound, that turning the wiper arm clockwise increases the amount of useful secondary winding turns, and thus the amount of voltage output which can be obtained. The AC output of the transformer is connected to a rectifier in a full wave bridge circuit. By means of the rectifier bridge circuit, DC output is obtained, and the 10,000 mfd. filter condenser filters the output to a clean DC.

The overload relay is of the self-resetting type and is provided to protect the rectifier from damage in the event of an overload. The overload passing through a bimetal strip heats it, causes it to bend, and thereby opens the circuit. Upon cooling, the bimetal strip again closes the circuit, and thus the self-resetting feature is accomplished. Both DC voltage and DC current outputs are continuously metered for convenience in operation.

SPECIFICATIONS

Meters: Voltmeter 0–15V DC, Ammeter 0–15A DC

Voltage Output: Variable 0–8V DC

Rated Output: 6V 10 Amp. Continuous, 15 Amp. Max. Intermittent

Power Requirements: 105–125V 50–60 Cycle AC, 175 Watts

Dimensions: 13¼" wide x 7¼" deep x 7¼" high

USE IT FOR . . .

Workbench voltage supply for powering car radios while under repair . . . simulating various battery operating voltages to check car radios for intermittents and shorts . . . charge storage batteries.

Model PS-1
Ship. Wt. 20 lbs.

$29.50

Heathkit LABORATORY

POWER SUPPLY KIT

Features

- The voltage output required for electronic setups
- Metered output for either voltage or current measurements
- Stand-by position to save experimental time
- Large 3½ meter clearly marked for DC V and MA and, DIRECT READING
- Source of filament supply, rated 6.3V AC at 4.5 amps.
- DC output from 50–300V

Use it as a variable voltage power supply when making vacuum tube characteristics curves—a B+ voltage supply in set-ups—experimental breadboard hookups—a source of reference voltage for meter calibration—and experimental hookups of all kinds. In addition to the HV output which is continuously variable within the limits outlined, 6.3V at 4.5 amps is available at the front panel.

CIRCUIT DESCRIPTION: The circuit consists of a 5Y3 full wave rectifier with its load consisting partly of two parallel connected 1619 tubes. The 1619 control tubes determine the current in the remaining portion of the load and therefore control the output voltage. An excellent metering system is provided so that either the output voltage or the output current can be constantly measured.

Limits:

No load	Variable 150-400V DC
25 MA	Variable 30-310V DC
50 MA	Variable 25-250V DC

Higher loads: Voltage drops off proportionally

YOU SAVE BY ORDERING DIRECT FROM MANUFACTURER

Heathkit MODEL IM-1 INTERMODULATION ANALYZER KIT

MODEL IM-1
Shipping wt. 18 lbs.

$39.50

Features

- Complete in one unit. High and low test frequency source — Intermodulation analyzer section — and power supply.
- Percent intermodulation is direct reading on 3 ranges: 30%, 10%, and 3% full scale.
- Both 4:1 and 1:1 ratios of low to high frequencies easily set up.
- Control for setting output of test signals. Control for adjusting input to analyzer section.
- Instrument has its own VTVM and filters for analyzer section.

Intermodulation distortion analysis is rapidly becoming acclaimed by engineers and audio experts as one of the most important means of audio testing. A high degree of intermodulation expresses itself in unpleasant listening quality and listening fatigue; a measurement of intermodulation is therefore an important guide in the design and improvement of audio equipment.

CIRCUIT DESCRIPTION: In this instrument, the requirements for IM testing are met by providing two devices: A generator, producing a mixture of two signals (60 cycles and a choice of two high frequency signals), and an analyzer for determining the IM distortion produced by the equipment under test. The generator uses a 60 cycle voltage derived from the power line and a locally generated high frequency voltage. These voltages are mixed in a resistive network. The inherent linearity of this network results in a mixed signal with negligible IM distortion. The voltage ratio of low and high frequency signals is adjustable within a range of more than 10 to 1 so that a variety of test conditions may be established. The meter in the analyzer may be used to set the desired voltage ratio.

The analyzer first removes the low frequency component from the applied signal, which leaves the high frequencies intact. These high frequencies may properly be considered as a high frequency modulated by a frequency of 60 cycles, which produces upper and lower side bands. The next step is to demodulate this signal, and an infinite impedance detector is used. The high frequency components of the detector output are removed by the low-pass filter and the remaining low frequency signal, which represents the modulation, is measured with the aid of the meter. To express this voltage as a modulation percentage, the level of the carrier has to be adjusted to a standard level, and such a provision is made in the instrument.

The voltmeter itself is also separately available for various incidental measurements, such as output voltage of the generator section, and voltage measurements on the equipment under test.

SPECIFICATIONS

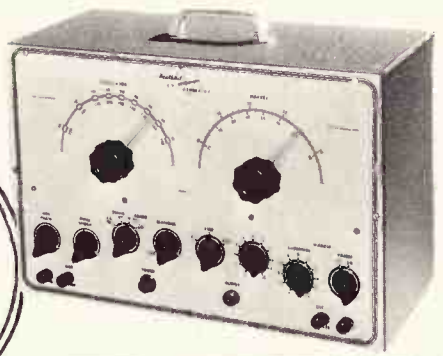
Tube Complement:
1—12AX7 Cascade Amplifier
1—12AT7 Detector and Meter Amplifier
1—6J5 HF Oscillator
1—6X5 Rectifier

Analyzer Ranges: Full Scale 30%—10%—3%
Generator Low Frequency: 60 cycles (Line Frequency)
Generator High Frequencies: Approx. 3000 and 7000 cycles
LF/HF Ratio: 4 to 1 voltage normal—can be set to any combination.
Generator Output Impedance: 3000 ohms
Voltmeter Ranges: Full Scale 30 —10 —3 Volts

USE IT FOR . . .

Intermodulation testing of: broadcast and sound equipment, quality amplifiers, networks and circuit components, wire or tape recorder and playback systems . . .

Heathkit TV ALIGNMENT GENERATOR KIT



Features

- All allocated TV channels as well as IF frequencies covered.
- Vernier drive of both oscillator and marker turning condenser.
- Blanking for establishing a single trace with base reference level.
- O-12 MC sweep width controlled from the front panel.
- Absorption type frequency marker covering 20-75 MC.
- Both step and continuously variable output.

$39.50

Model TS-2
Shipping Wt. 20 lbs.

Here is an excellent TV Alignment Generator designed to do TV service work quickly, easily, and properly. The Model TS-2 when used in conjunction with an oscilloscope provides a means of correctly aligning television receivers.

The instrument provides a frequency modulated signal covering, in two bands, the range of 10 to 90 Mc. and 150 to 230 Mc. All allocated TV channels as well as IF frequencies are covered.

An absorption type frequency marker covers from 20 to 75 Mc in two ranges—therefore, you have a simple, convenient means of frequency checking of IF's independent of oscillator calibration.

Sweep width is controlled from the front panel and covers a sweep deviation of O-12 Mc—all the sweep you could possibly need or want.

And still other excellent features are: horizontal sweep voltage available at the front panel and controlled with a phasing control—a convenient instrument stand-by position—and blanking. Make your work easier, save time, and repair with confidence—order your Heathkit TV Alignment Generator.

SPECIFICATIONS

Frequency Range: Low Band—10 to 90 Mc
High Band—150 to 230 Mc
Sweep Deviation: 0–12 Mc or more
Absorption Marker
Frequency Range: Low Range—20 to 40 Mc.
High Range—40 to 75 Mc.
Blanking: Return trace may be eliminated by Blanking Circuit incorporated.
Tube Complement:
2C22/7193 VHF Triode Variable Osc.
2C22/7193 VHF Triode Fixed Osc.
2C22/7193 VHF Triode Mixer
6SQ7 Blanking Amplifier
6X5 Rectifier

USE IT FOR . . .

Properly and completely aligning TV receivers . . . peaking both video and sound IF strips . . . checking proper width of both RF and IF response curves . . .

YOU SAVE BY ORDERING DIRECT FROM MANUFACTURER

Heathkit MODEL AF-1 AUDIO FREQUENCY METER KIT

MODEL AF-1
Shipping weight 15 lbs.
$34.50

Features

- Extremely simple to operate.
- Seven ranges for accurate readings.
- Any voltage between 2 and 300V RMS can be fed directly into the unit.
- Reads any frequency between 20 cycles and 100 KC directly on meter.
- Input waveshape not critical.

Here is a simple and easy way to check unknown frequencies anywhere between 10 cycles and 100 KC. Coverage through and beyond the audio range. Instrument involves no vibrating reeds or rotating discs — It's electronic. All the operator has to do is set the range switch for the most convenient reading—feed in an unknown frequency of any level between 2 and 300V RMS—and read the meter. Instrument has seven ranges for greater accuracy and wide coverage. The meter itself has a quality 200 Microampere Simpson movement and large, clearly marked scales.

CIRCUIT DESCRIPTION: The input signal is fed to the first stage where it is amplified. If the peak voltage of the input signal is sufficiently high, the tube is overdriven, resulting in some clipping of the input waveform. This amplified and partially clipped signal is then fed to the second stage which is considerably overdriven and complete clipping action takes place to form a square wave.

The square wave from the second stage passes through a differentiating circuit which changes it to a series of spiked pulses. These pulses are fed to a dual diode switching tube which permits only the negative pulses to pass through the meter circuit. The number of pulses per second passing through the meter is directly proportional to the frequency of the input signal. The meter deflection is proportional to the current, or number of pulses, passing through it and the meter can therefore be calibrated to read the frequency of the input signal.

The power supply consists of a full wave rectifier with two stages of resistance—capacitance filtering. A voltage regulator tube is used to maintain a constant plate voltage on the second clipping stage.

SPECIFICATIONS

Power Requirements: 105–125 V AC 50–60 Cycles, 35 Watts

Tube Complement: 1—6V6, 1—6H6, 1—6X5 1—6SJ7, 1—VR150

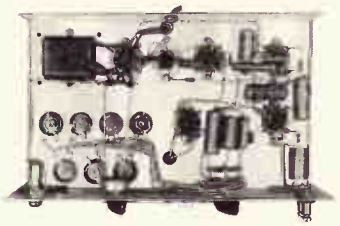
Ranges: 0–100, 0–300, 0–1Kc, 0–3Kc, 0–10Kc, 0–30Kc, 0–100Kc

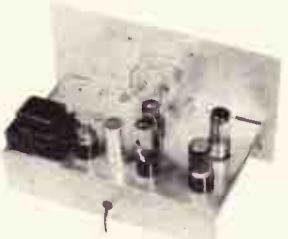
Input: Impedance 250,000 Ohms at 1,000 CPS
Voltage 2–300 Volts RMS

Physical Specifications: 12½" long x 7" high x 7½" deep

USE IT FOR . . .

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





Heathkit SQUARE WAVE GENERATOR KIT

Features

- Ideal for audio and TV checking.
- Low output impedance.
- True square wave output.
- Wide range — 10 cycles to 100 Kilocycles —
- Provision for external synchronization.
- High variable output, 0-20 Volts.

MODEL SQ-1
Shipping wt. 14 lbs.

$29.50

The Heathkit Square Wave Generator is an excellent square wave frequency source with features you won't want to be without. Especially notable is the wide range of the instrument—10 cycles to 100 kilocycles continuously variable. This wide range makes it useful for television and wide band amplifier work as well as audio experimentation. The output impedance is low, and the output voltage is continuously variable between 0 and 20 volts. Because a multivibrator stage cannot be accurately calibrated, terminals on the front panel can be used for synchronization to an external source should it be desired.

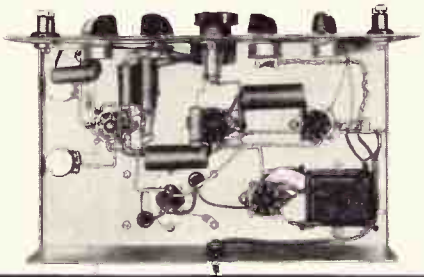
For a good, wide range, and low priced square wave generator, the SQ-1 just can't be beat.

CIRCUIT DESCRIPTION: The first two stages (multivibrator section) are built around a twin triode tube. Provision is made to inject an external synchronizing voltage into the grid circuit of the first stage if desired. Frequency control is accomplished by varying the time constant of the R-C coupling between the two stages.

The next stage is a clipping circuit. This takes the signal from the multivibrator section and clips it to a well proportioned square wave.

A cathode follower circuit is used as the output stage. The cathode follower provides the very wide frequency response necessary to properly pass hi-frequency square waves. Also the low impedance of the cathode follower output makes possible the very short rise time of the output wave.

The power supply is a well filtered, choke input type with two sections of L-C filtering.



SPECIFICATIONS

Power Requirements: 105–125 V AC, 50–60 Cycle, 10 Watts

Ranges: 100—1000—10 Kc—100 Kc

Tube Complement: 1—6SL7, 1—6AC7, 1—6V6, 1—6X5

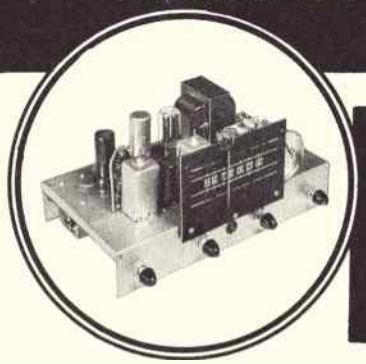
Physical Specifications: 12½" Long, 7" High 7½ Deep

USE IT FOR . . .

A good source of square wave output from 20 cps to 100 kc for square wave testing of amplifiers, electrical components, networks, etc., to study phase shift, distortion, high and low frequency response . . .

YOU SAVE BY ORDERING DIRECT FROM MANUFACTURER

Heathkit SUPERHETERODYNE RECEIVER KITS

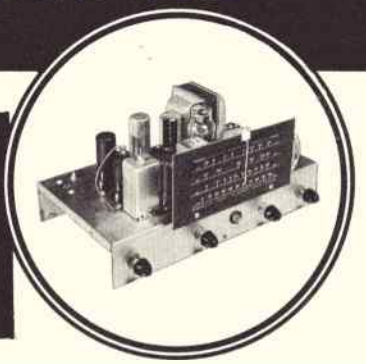


Model BR-1 Broadcast Model Kit covers 550 to 1600 Kc. Shipping Wt. 11 lbs.

$19.50

Model AR-1 3 Band Receiver Kit covers 550 Kc. to over 20 Mc. continuous. Shipping Wt. 11 lbs.

$23.50



Features

- Inverse feedback for improved frequency response.
- Dual iron-core tuned type IF transformers.
- Complete provisions for phono connections — including socket for phonometer plug.
- Full range tone control.
- Transformer operated — Power line isolated from chassis.
- Excellent sensitivity and selectivity.
- Vernier tuning of 9 to 1 ratio.
- 6 inch calibrated slide rule dial — easy to read.
- Full AVC action.

These two superheterodyne receivers are each designed to give excellent reception and yet remain low in cost. Both are power transformer operated and are supplied with an output transformer for operation with a PM dynamic speaker. (Cabinet and speaker not included.)

Both receivers have the same IF, audio, and power supply circuits. The tube line up for these circuits is composed of a 12SH7 high gain IF amplifier, a 12C8 detector and amplifier, and a 12A6 beam power output tube. The power supply uses a 5Y3 in a full-wave rectifier circuit.

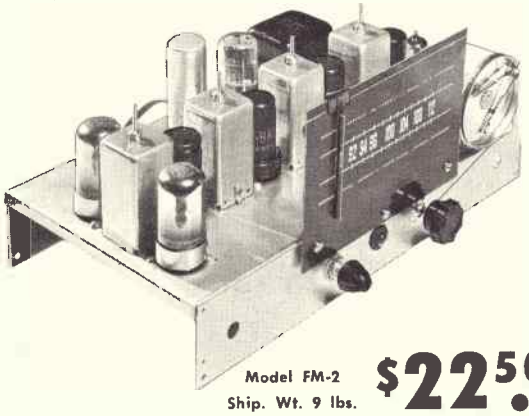
The receivers have full AVC action fed to two stages. Inverse feedback is used from the voice coil winding to the 12A6 cathode for improved frequency response. IF transformers are of the dual iron-core tuned type which give the greatest gain per stage and are far more stable than the cheaper trimmer type. The six inch calibrated slide rule dial has a 9 to 1 vernier to provide easy station selection.

The receivers have the following RF sections: Model AR-1 "All Wave Receiver," covers three bands—broadcast, police, and short wave. Coverage is from 550 Kc to 20 Mc. A "logging" scale is also provided. The broadcast, police and short wave switch throws in the proper antenna, RF input, and oscillator coils. The band switching coil unit is assembled on a separate small chassis to simplify its construction and prevent damage during assembly. The RF section uses a 1626 (or 12J5) oscillator and 12SH7 to allow maximum conversion gain over the short wave bands.

Model BR-1 "Broadcast Receiver" gives excellent reception over the broadcast band (550-1600KC). Its RF section utilizes a 12K8 mixer-oscillator.

Both receivers are specially equipped for the use of phonograph record players or changers. A phono input socket is provided as well as the proper plug for phono units which are not equipped with standard plugs. A 110V plug on the chassis furnishes power for the turntable motor. A phono switch changes the receiver from radio to phono operation.

Heathkit FM TUNER KIT



Model FM-2
Ship. Wt. 9 lbs.

$22.50

Features

- A total of eight tubes
- Three IF transformers and a limiter transformer all all double slug — tuned, 10.7 Mc. IF
- Power transformer operated
- 6X5 in full wave rectifier circuit
- Complete, ready wired, tuning assembly
- Large slide rule calibrated dial plate for easy reading
- Vernier tuning
- Excellent stability
- 110V socket on chassis for connecting an amplifier
- High sensitivity.

Design is such that when the tuner is fed into the audio section of an AM receiver or into an amplifier with speaker, excellent station reception is obtained and all the fine, rich qualities of FM are brought out.

A ready-wired tuning assembly consisting of the antenna coils, oscillator coil, antenna and oscillator trimmers, and the two gang tuning condenser, is furnished. Kit construction is really easy.

The main and oscillator tuning condensers are ganged and produce a 10.7 Mc. IF. The tube line up consists of 7E5/1201 oscillator, a 6SH7 mixer, two 6SH7's as IF amplifiers, a 6SH7 as a limiter, two 7C4/1203A discriminator diodes and a 6X5GT rectifier. The entire unit is transformer operated thereby making it safe to use with AC-DC receivers and amplifiers. The unit has three, slug-tuned IF transformers and a discriminator transformer.

As illustrated, station selection is indicated by a calibrated slide rule dial plate and a pointer which operates from a dial drum assembly. Thus, tuning which has a mechanical ratio for easy station selection as well as smooth operation is obtained.

Don't miss out on FM reception when such an excellent tuner can be obtained at this low price.

SPEAKERS

Listed below are good, low cost speakers we have selected for use with the Heathkits indicated.

AR-1 and BR-1 RECEIVER KITS
No. 320 — 5" SPEAKER
SHIPPING WT. 2 LBS.
$2.75

A7 and A-7A AMPLIFIER KITS
No. 304 — 12" SPEAKER
SHIPPING WT. 7 LBS.
$6.95

A8 and A-8A AMPLIFIER KITS
No. 326 — 12" 20 WATT SPEAKER
SHIPPING WT. 7 LBS.
$7.50

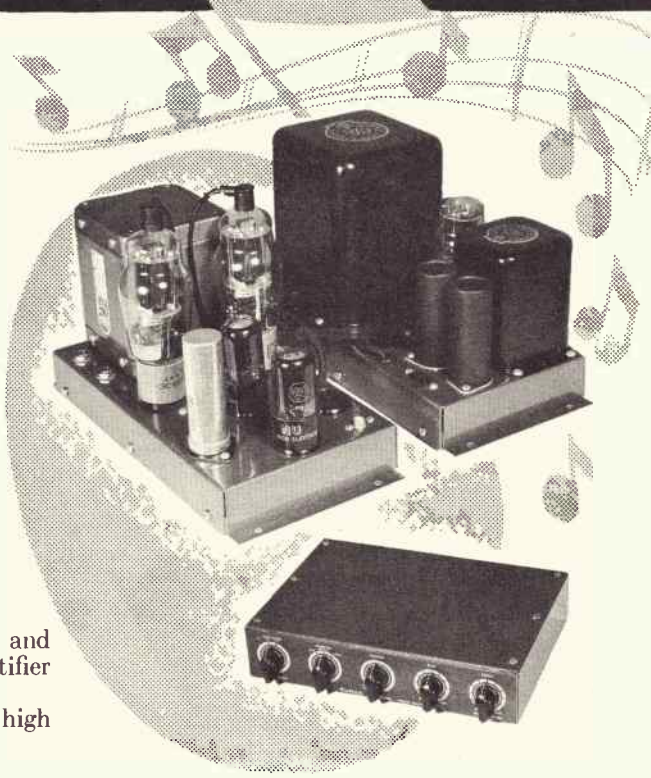
YOU SAVE BY ORDERING DIRECT FROM MANUFACTURER

NEW *Heathkit* WILLIAMSON TYPE

AMPLIFIER KIT

AMPLIFIER *Features*

- **First Williamson Type Amplifier supplied with *matching* preamplifier.**
- **Uses Altec Lansing Peerless output transformer.**
- **Practically distortionless — Harmonic and intermodulation distortion *both* less than ½ of 1% at 5 watts output.**
- **Frequency response ± 1db from 10 cycles to 100 kc.**
- **Output impedance 4, 8, or 16 ohms.**



The new Heathkit Williamson Type Amplifier kit is the best obtainable in amplifiers today—the choice of the really discerning listener. You can *hear* the difference and measurements actually bear out the superb performance. Frequency response ± 1 db from 10 cycles to 100 kc allow you to hear the highs and lows with equal crispness and clarity. Harmonic and intermodulation distortion both less than ½ of 1% at 5 watts output eliminate the harsh and unpleasant qualities which contribute to listening fatigue.

The circuit is similar to the one published in Audio Engineering Magazine for November, 1949, and is considered by engineers throughout the audio field as one of the best ever developed. The Main Amplifier (which may be purchased separately) consists of a voltage amplifier and phase splitter using a 6SN7, a driver stage using a 6SN7, and a push-pull output stage using a pair of 807 tubes. The output transformer is manufactured by Peerless Division of Altec Lansing and is built to their highest standards. Output impedances of 4, 8, and 16 ohms are available. The power supply uses a separate chassis with husky Chicago Transformer power transformer and choke, and 700 V Mallory filters for long hum-free operation. A 5V4G rectifier is used.

The main amplifier and power supply are each on a chassis measuring 7″ high by 5½″ wide by 11″ long.

PREAMPLIFIER AND TONE CONTROL UNIT KIT

The preamplifier kit consists of: a 12AX7 (or 12AY7) dual triode first amplifier stage with a turn-over control for LP or 78 record types, and a 12AU7 amplifier stage with individual bass and treble tone controls which each provide up to 15db of boost or attenuation. A switch on panel selects either magnetic, crystal, or tuner inputs. The operating voltages are obtained from the Main Amplifier. Off-On switch on Preamplifier conveniently controls AC power to both Preamplifier and Main Amplifier thereby eliminating separate switching. Preamplifier has an attractive hammer-tone finish and is mounted on rubber feet so that it may be placed near the record player or tuner. The Preamplifier also is well suited to custom installations—it will operate in either vertical or horizontal position, and special notched shafts of the controls and switches allow a variety of shaft lengths to be selected. Dimensions: 2¼″ high by 10¼″ wide by 7¼″ deep.

BOTH UNITS (Main Amplifier and Preamplifier) are supplied complete with tubes, cables, plugs, and all other parts. Detailed assembly manual with its detailed step-by-step instructions and pictorial diagrams makes assembly easy. Both Preamplifier and Main Amplifier are finished in attractive and durable grey hammer-tone finish.

PRICES OF VARIOUS COMBINATIONS

WA-A1 Amplifier kit — Combination 1 — (Main Amplifier and Power Supply) complete with WA-P1 Preamplifier kit . . . . . .
Total Shipping Weight 45 lbs. (Shipped Express only) **$69.50**

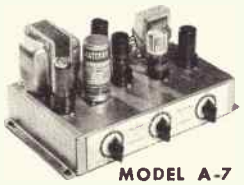
WA-A1 Amplifier kit only — Combination 4 — (Main Amplifier and Power Supply). Less WA-P1 Preamplifier.
Total Shipping Weight 29 lbs. (Shipped Express only) . . . . . Price **$49.75**

WA-P1 Preamplifier kit *only*. (Less power supply) Tubes included).
Total Shipping Weight 7 lbs. (Shipped Express only) . . . . . Price **$19.75**

PLEASE BE SURE TO STATE COMBINATION NUMBER WHEN ORDERING.

Heathkit ECONOMY 6 WATT

AMPLIFIER KIT



MODEL A-7
Shipping Wt. 8 lbs.
$14.50

- **Response flat ± 1½ db from 20 — 20,000 cycles.**
- **Output tubes working in push pull.**
- **Volume, base, and treble controls.**
- **Two separate inputs.**

The purpose of this kit is to provide to the kit builder a low cost amplifier with excellent fidelity. The circuit consists of four tubes with the following functions: a 12SL7, one section working as an amplifier and one as a phase splitter, two 12A6 output tubes working in push pull, and a 5Y3 rectifier in a full wave rectifier circuit.

The unit operates from a husky power transformer, and has good output transformer with a choice of 4—8—15 ohm output impedances. (Speaker not included.)

The kit provides excellent listening pleasure and the price is really low. Compare it with all others. You won't find a better buy.

MODEL A-7: For tuner and crystal phono inputs. Has two position selector switch for convenient switching to type of input desired.

MODEL A-7-A: Has a 12SH7 preamplifier stage with special compensation network for operation with reluctance phono input. Shipping Wt. 8 lbs. **$16.50**

Heathkit HIGH FIDELITY...20 WATT

AMPLIFIER KIT

MODEL A-8
Shipping Wt. 19 lbs.
$33.50

The A8 (or A-8A) is a high quality amplifier for those who want high fidelity output at moderate cost. Frequency response within ± 1db from 20–20,000 cycles. Distortion at 3db below maximum power output (at 1,000 cycles) is only .8%. Kit has a Chicago power transformer in drawn steel case and a Peerless output transformer with output impedances of 4—8—16 ohms. Bass and treble controls permit listener to select output with tonal qualities of his own liking.

The tube lineup is composed of a 6SJ7 voltage amplifier, a 6SN7 amplifier and phase splitter, two 6L6's in push-pull output and a 5U4G rectifier. All parts furnished (speaker not included) and the construction manual makes assembly easy.

MODEL A-8: For tuner and crystal phono inputs. Has two position selector switch for convenient switching to type of input desired.

MODEL A-8A: Features an added 6SJ7 stage (preamplifier) for operating from variable reluctance cartridge phono pickup, mike input, and either tuner or standard crystal phono pickup. A three position selector switch provides flexible switching. Shipping Wt. 19 lbs. **$35.50**

YOU SAVE BY ORDERING DIRECT FROM MANUFACTURER

HEATH COMPANY facilities are complete

OFFICE

Orders are received and processed in the office. Most orders are filled the very same day they are received. We consider rapid and efficient service to the customer an absolute necessity.

ENGINEERING

The Heath Company laboratory where Heathkits receive their extensive and long range engineering. Here the layout is made, the design is worked out, sample kits are built and completely tested. Such a thorough work-out in this complete laboratory assures you excellent operation from your completed Heathkit.

FACTORY

You save money because of our complete facilities to make kit chassis and panels in our own plant. Shearing, punching, forming, spot welding, painting, and screening is all done right here.

PACKING AND SHIPPING

All packing and shipping is done with the utmost care. In so doing, we can be sure of shipping kits which are complete with all parts and packed so as to not be damaged in transit.

SERVICE DEPARTMENT

Less than 2% of the Heathkits sold require any factory attention whatever. The Service Department is maintained so that if the builder for any reason has difficulty in getting his newly constructed instrument to work, he can send the unit to the Service Department where it will be placed in proper working condition at a very nominal charge. The service policy is outlined in each manual.

ART DEPARTMENT

Heath Company artist preparing a pictorial diagram which is a part of the construction manual. Manuals have schematics, pictorial diagrams, sketches, detailed assembly and wiring instructions, operating instructions, suggested uses, etc. Such complete manuals make for trouble-free construction to the kit builder.

TECHNICAL CONSULTATION

So that each technical inquiry can be given specific attention, technical correspondents stand ready to help the customer at all times. Should the kit builder desire any technical help during the construction of his kit, or assistance in obtaining proper operation of the completed instrument, he can write the company, and these specialists will attempt to diagnose the difficulty and in the majority of cases will be able to pass along the information needed.

F

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Quantity	Item and Shipping Wt.	Price	Quantity	Item and Shipping Wt.	Price
	Heathkit Oscilloscope Kit—Model O-7 (29 LBS.)			Heathkit A.C. VTVM Kit—Model AV-2 (5 LBS.)	
	Heathkit Voltage Calibrator Kit Model VC-1 (5 LBS.)			Heathkit Intermodul. Analyzer Kit—Model IM-1 (18 LBS.)	
	Heathkit VTVM Kit—Model V-5A (7 LBS.)			Heathkit Audio Freq. Meter Kit—Model AF-1 (15 LBS.)	
	Heathkit R.F. Probe Kit—No. 309 (1 LB.)			Heathkit Square Wave Gen. Kit—Model SQ-1 (14 LBS.)	
	Heathkit H.V. Probe Kit—No. 336 (2 LBS.)			Heathkit Amplifier Kit—Model A-7 (10 LBS.)	
	Heathkit Peak-to-Peak Volt. Probe Kit No. 338 (2 LBS.)			Heathkit Amplifier Kit—Model A-7A (10 LBS.)	
	Heathkit FM Tuner Kit—FM-2 (9 LBS.)			Heathkit Amplifier Kit—Model A-8 (19 LBS.)	
	Heathkit Broadcast Receiver Kit—Model BR-1 (11 LBS.)			Heathkit Amplifier Kit—Model A-8A (19 LBS.)	
	Heathkit Three Band Receiver Kit—Model AR-1 (11 LBS.)			Heathkit Regulated Power Supply Kit—Model PS-2 (20 LBS.)	
	Heathkit Tube Checker Kit—Model TC-1 (12 LBS.)			Heathkit Battery Tester Kit—Model BT-1 (3 LBS.)	
	Heathkit T.V. Tube Adapter No. 355 (1 LB.)			Heathkit Resistor Substitution Box Kit—Model RS-1 (3 LBS.)	
	Heathkit Audio Generator Kit—Model AG-7 (16 LBS.)			**WA-A1 Amplifier Kit—Combination 1**—(Main Amplifier and Power Supply) complete with WA-P1 Preamplifier kit. Total Shipping Weight 39 lbs. (Shipped Express only.)	**$69.50**
	Heathkit Battery Eliminator Kit—MODEL BE-3 (20 LBS.)				
	Heathkit Electronic Switch Kit—Model S-2 (11 LBS.)				
	Heathkit T.V. Alignment Gen. Kit—TS-2 (20 LBS.)			**WA-A1 Amplifier Kit—Combination 2**—(Main Amplifier and Power Supply) complete with WA-P1 Preamplifier kit and Electro-Voice SP12B speaker. Total Shipping Weight 45 lbs. (Shipped Express only)	**$96.00**
	Heathkit Signal Tracer Kit—Model T-2 (8 LBS.)				
	Heathkit Scope Demodulator Probe Kit No. 337 (1 LB.)				
	Heathkit R.F. Signal Gen. Kit—Model SG-6 (7 LBS.)			**WA-A1 Amplifier Kit only—Combination 4**—(Main Amplifier and Power Supply). Less WA-P1 Preamplifier and speaker. Total Shipping Weight 29 lbs. (Shipped Express only.)	**$49.75**
	Heathkit Condenser Checker Kit—Model C-2 (7 LBS.)				
	Heathkit Handitester Kit—Model M-1 (3 LBS.)				
	Heathkit Resistance Decade Kit—Model RD-1 (4 LBS.)			**WA-P1 Preamplifier Kit only.** (Less power supply) tubes included. Total Shipping Weight 7 lbs. (Shipped Express or Parcel Post.)	**$19.75**
	Heathkit Impedance Bridge Kit—Model IB-1B (15 LBS.)				

On Porcel Post Orders, include postage for weight shown and insurance. (We insure all shipments.)

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

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