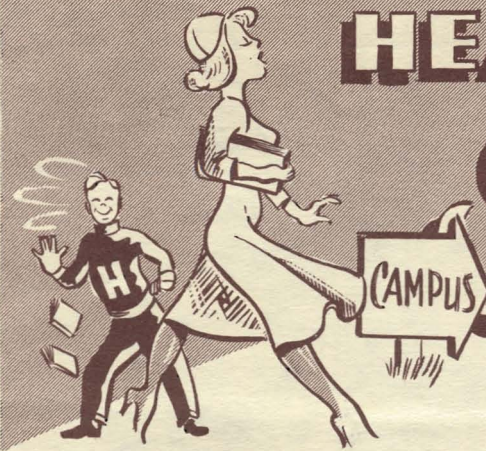
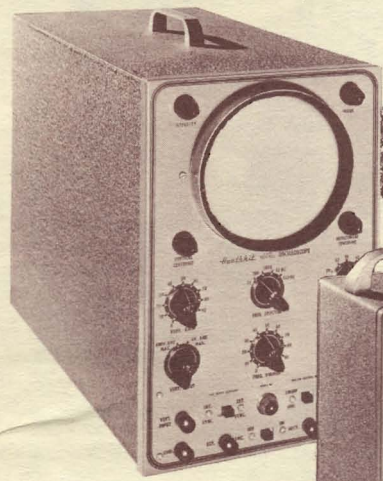


HEATH September FLYER



Announcing the New 1952 MODEL HEATHKITS



NEW HEATHKIT OSCILLOSCOPE KIT

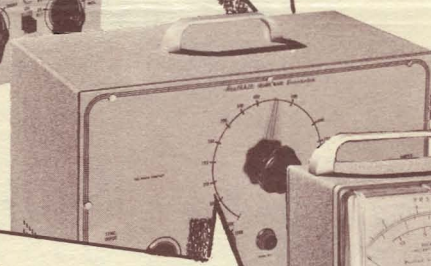
A completely new 5" Oscilloscope Kit. New vertical amplifier with response to 5 MC and gain of .03V RMS per inch—New improved sweep, faster retrace time. New "spot shape" (astigmatism) control—New special mounting of phase splitter and deflection amplifier tubes near CR tube base for improved frequency response. Read about it on page 2



NEW HEATHKIT VACUUM TUBE VOLTMETER KIT

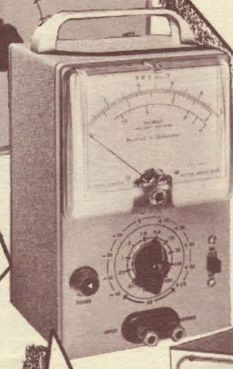
Handsome new V-5 VTVM Kit. Greatly reduced size and new beautifully designed cabinet. Uses new miniature twin triode in special cathode balancing circuit. New battery mounting clamp with base spring clip for good electrical contact. Shown on page 3.

ANNOUNCED FOR
THE FIRST TIME



NEW HEATHKIT SQUARE WAVE GENERATOR KIT

New Square Wave Generator Kit. Wide range 10 cycles to 100 KC. Low impedance output—continuously variable output voltage between 0 and 20V. See page 4.



BRAND NEW
INSTRUMENTS

NEW HEATHKIT AC VACUUM TUBE VOLTMETER KIT

New AC VTVM Kit. Reads from 1 millivolt to 300V RMS, - 52 to + 52 Db. Frequency response within 1 Db from 20 cycles to 50 KC. Operation handled with only one control. Ideal for audio work. Note page 4.

NEW HEATHKIT INTERMODULATION ANALYZER KIT

New Intermodulation Analyzer Kit. Read intermodulation directly on the instrument's own VTVM—full scale readings of 30%, 10% and 3%. Supplies its own signals for the testing (two high frequencies and one low frequency) both 1:1 and 4:1 ratios of low to high frequencies easily set up—Read about it and its uses on page 5.



NEW HEATHKIT AUDIO FREQUENCY METER KIT

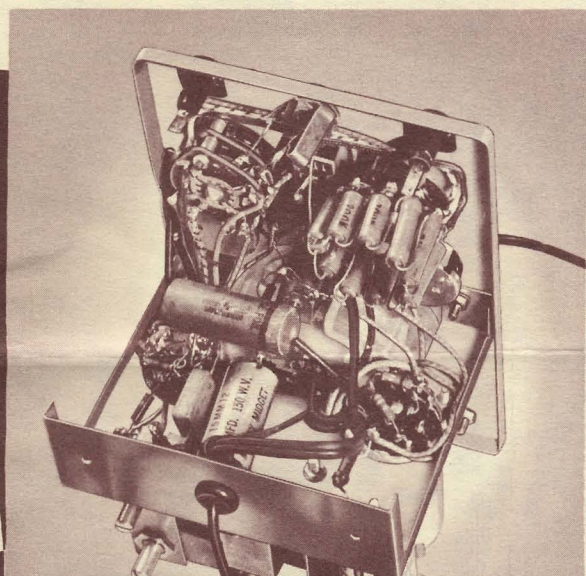
A new Audio Frequency Meter Kit. The ideal instrument for measuring frequencies from 20 cycles to 100 KC. Simple to operate and direct reading. No cumbersome set-ups required. Input voltage from 2 to 300 volts can be fed directly into instrument. Input waveshape not critical. Described on page 5.



1952 HEATHKIT VTVM A MERE HANDFUL HEATHKIT V-5 VOLTMETER KIT

Features

- * New styling,—formed case for beauty.
- * New truly compact size. Cabinet 4 1/8" deep by 4-11/16" wide by 7 3/8" 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 1/2V to 1000V AC, 1/2V 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.



MODEL V-5
SHIPPING WEIGHT 5 LBS.

\$24.50

It's a mere handful in size—but a giant in the range of measurements it can make. Designed to take up a minimum of space, yet designed to be the most important and useful instrument on your workbench!!!

Really a handsome looking instrument—front panel and rear cover slide over recessed flanges of case—cut to the left shows detail of this new construction. Note that panel and case are flush and corners are actually formed and rounded. New compact size has cabinet dimensions of only 4 1/8" deep X 4 11/16" wide X 7 3/8" high.

Tremendous coverage—Will read from 1/2V to 1000V AC, 1/2V to 1000V DC, .1 to over 1 billion ohms resistance, and Db. Meter scale has zero set mark for FM alignment—All scales clearly marked for easy and fast readings and Db scale is in red for easy identification.

Convenient and simple to operate. Ohms adjust, and zero adjust controls are located on front panel with selector and range switches. Selector switch has four positions AC, DC-, DC+ and Ohms to set up the instrument for type of reading desired. DC- position allows negative voltages to be taken without reversing test prods. AC and DC voltage ranges are full scale 3V - 10V - 30V - 100V - 300V - 1000V and resistance ranges are RX1, X10, X100 X1000, X10M, X1 Megohm.

Strictly highest quality components used throughout—1% precision resistors in multiplier circuit, Simpson 200 ua meter movement, sturdy cabinet, excellent positive detent, smooth acting switches etc. New miniature tube used in meter balancing circuit and new battery holding clamp and spring clip assure good contact to ohms string of resistors. Kit comes complete—and the instruction manual with its step-by-step instructions, pictorials, figures, and schematic makes assembly a pleasure.

The OUTSTANDING LEADER IN APPEARANCE and PERFORMANCE

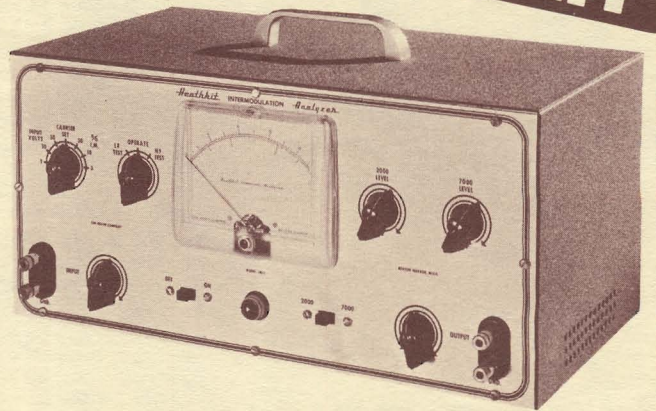
INTERMODULATION TESTING FOR ALL *Heathkit* ANALYZER KIT

- * 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 one of the most important means of testing audio equipment. Circuit non-linearity leads to an intermodulation of the frequencies going through a system (such as an amplifier) and a high degree of intermodulation expresses itself in unpleasant listening qualities and listening fatigue.

A measurement of the intermodulation is therefore an important guide in the design and improvement of audio equipment. Testing quality music amplifiers is an especially important application for the intermodulation analyzer.

The Heathkit Intermodulation Analyzer Kit will allow you to make these important intermodulation measurements. The unit supplies its own test signals—two high frequencies (3000 CPS and one higher) and one low frequency (60 CPS). Both 1:1 or 4:1 ratios of low to high frequencies can be easily set up for testing. Analyzer section has its own filters and VTVM for directly reading intermodulation on full scale ranges of 30%, 10% and 3%. Built in power supply furnishes all necessary operating voltages thereby making the instrument completely self contained.



MODEL IM-1
SHIPPING WEIGHT 18 LBS.

\$39.50

CHECK YOUR UNKNOWN AUDIO FREQUENCIES

Heathkit AUDIO FREQUENCY METER KIT

- * Extremely simple to operate.
- * Input waveshape not critical.
- * 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.

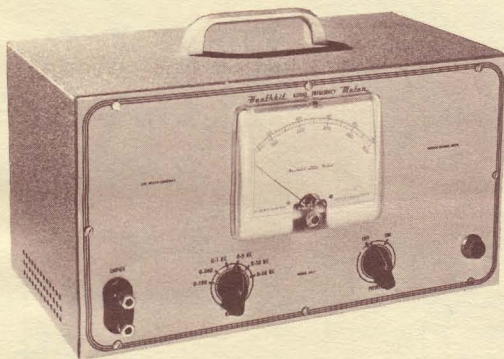
Here is a simple and easy way to check unknown frequencies anywhere between 10 cycles and 100 KC. Coverage through and beyond the audio range. Instrument involves no vibrating reeds or rotating discs—It's electronic.

Waveshapes showing circuit operation are shown below—the unknown frequency is fed in (A), after two stages of squaring and clipping it looks as in (B), differentiation takes place (C), the signal is next passed through a switching tube (D), and the frequency is read on the meter (E).

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.

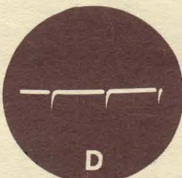
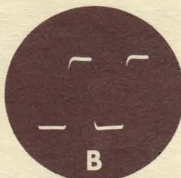
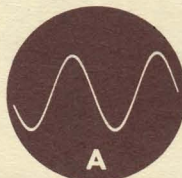
Instrument has seven ranges for greater accuracy and wide coverage. The meter itself has a quality 200 Microampere Simpson movement and large, clearly marked scales. Full scale readings are 100 - 300 - 1000 - 3000 - 10,000 - 30,000 - 100,000 cycles.

Kit comes complete with all parts and instruction manual—An audio frequency meter is a real time saver in checking frequencies.



MODEL AF-1
SHIPPING WEIGHT 12 LBS.

\$34.50



THE ONLY COMPLETE LINE OF KIT INSTRUMENTS

Heathkit CONDENSER CHECKER KIT

Heathkit HANDITESTER KIT

Keep one in your car or around the house to make quick continuity or voltage checks. Ideal for outside service calls.

Really a fine instrument with only high quality parts—all precision resistors, a three deck switch for convenient and trouble free mounting of parts, a specially designed battery mounting and contact bracket, a smooth acting ohm adjust control, beautiful molded Bakelite case, 400 microamp meter movement, etc.

DC and AC voltage ranges 10-30-300-1000-5000. Ohms ranges 0-3000 and 0-300,000. DC MA ranges 0-10 and 0-100.

Large size, 2 color scale makes reading easy.

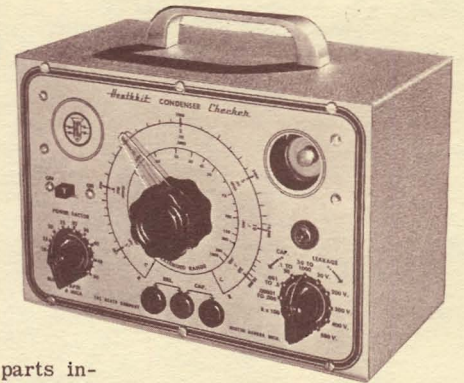
Really easy to build, and all parts and construction manual furnished.

MODEL M-1
SHIPPING WEIGHT 3 LBS.

Only
\$13.50

There is no need to wonder about the capacity of a condenser or guess if it is leaky and, therefore liable to cause trouble—the condenser checker kit will quickly give you the answer. The magic eye indicator makes testing easy.

Covers a direct reading range of .00001 MFD to 1,000 MFD. Measures power factor of electrolytics between 0% and 50%. Has a leakage test for condensers with voltage ratings from 20 to 500 volts—Measures resistance from 100 ohms to 5 megohms.

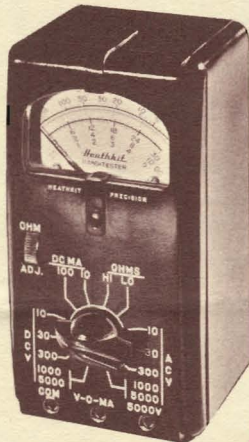


MODEL C-2
SHIPPING WEIGHT 6 LBS.

\$19.50

Comes complete with parts including tubes, punched and formed chassis, controls switches, etc. A kit you'll want for your service work.

Try it, and you won't be sorry.



Heathkit SIGNAL TRACER & UNIVERSAL TEST SPEAKER KIT

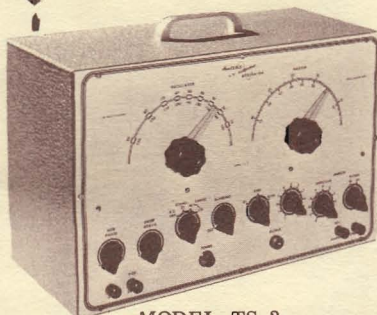
\$19.50



MODEL T-2
SHIPPING
WEIGHT 7 LBS.

Locate improper operation of receivers the quick, efficient way. USE A HEATHKIT SIGNAL TRACER AND TEST SPEAKER. Stages without a speaker or output transformer can be easily checked. Tracer has its own test speaker and thirty different impedance ratios for matching to stage under test. Checks either single ended or push-pull stages with equal ease. Really give receivers a thorough going over—from the antenna clear through the speaker by using the Heathkit Signal Tracer.

Heathkit T.V. ALIGNMENT GENERATOR KIT



MODEL TS-2
SHIPPING WEIGHT 20 LBS.

\$39.50

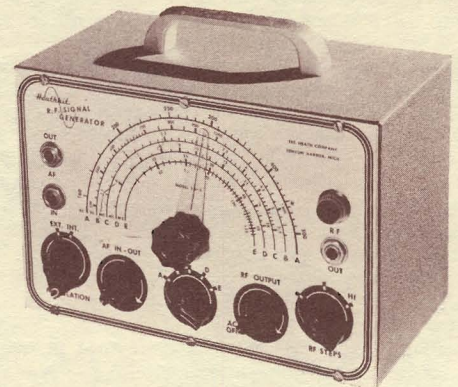
The Model TS-2 when used in conjunction with an oscilloscope provides a means of properly aligning every stage of a television receiver. The instrument provides a frequency modulated signal covering, in two bands, the range of 10 to 90 Mc. and 150 to 230 Mc.—thus, ALL ALLOCATED TV CHANNELS AS WELL AS 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 of 0-12 Mc. is controlled from the front panel.

And still other excellent features are: Horizontal sweep voltage available at the front panel, both step and continuously variable output—stand-by position—vernier drive of both oscillator and marker tuning condensers—and blanking. Make your work easier, save time, and repair with confidence with a Heathkit TV Alignment Generator.

Kit comes complete with all parts and detailed manual.

Heathkit

R.F. SIGNAL GENERATOR KIT



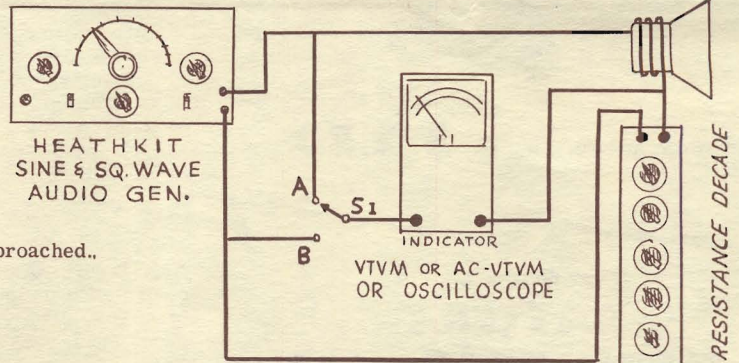
MODEL SG-6
SHIPPING WEIGHT 7 LBS.

\$19.50

HEATHKIT APPLICATION — FINDING SPEAKER IMPEDANCE

To properly match a speaker voice coil to an output transformer with several taps, it is necessary to know the impedance of the voice coil. Using Heathkit equipment, the arrangement below can be easily set up for finding this impedance. Generally, the test should be made at 400 cycles, but should the impedance be based on some other frequency (such as 1000 cycles) the method described here is still applicable. (The audio generator is merely set to 1000 cycles.)

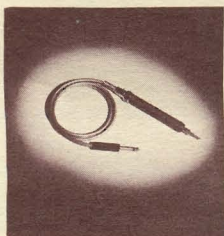
- Connect the equipment as above, and set controls as follows:
- AUDIO GENERATOR:** Set for 400 cycle sine wave output, low impedance. Keep output at low level until null test is to be made. **DO NOT SET GENERATOR OUTPUT TO A LEVEL** which might damage the speaker or resistance decade.
- VTVM:** Set to 3V scale, and selector switch to AC.
- AC VTVM:** Start at 3V scale and go to lower scales as null is approached.
- SCOPE:** Connect to vertical input terminals.
- RESISTANCE DECADE:** Set to about 2 ohms and work-up.



TEST: Adjust the resistance decade until no change in the indicator is shown as switch is thrown between positions A and B. This is the null point, and the reading on the Resistance Decade is now that of the speaker voice coil impedance.

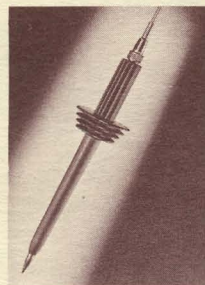
NOTE: This is a basic example showing a good method for finding an unknown speaker voice coil impedance. However, the method is general and not only applicable to voice coil impedances. Many other impedance measurements will no doubt immediately suggest themselves to the reader. Other applications will naturally require different instrument settings from those above. Care should be exercised to not damage either the test equipment or units under test.

Heathkit R.F. PROBE KIT



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. $\pm 10\%$. Works on any 11 megohm input VTVM.

NO. 309 RF PROBE KIT **\$5.50**
SHIPPING WEIGHT 1 LB.



Heathkit 30,000 V. DC PROBE KIT

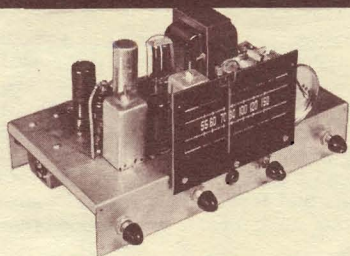
For TV service work and all other high voltage applications. Sleek looking. Two color molded plastic—red body and guard, and jet black handle. Designed to plug into Heathkit VTVM so that the 300V scale is conveniently multiplied by 100. Can be used with any standard 11 Megohm VTVM.

NO. 336 HIGH VOLTAGE PROBE KIT
SHIPPING WEIGHT 2 LBS.

\$5.50

HIGH QUALITY *Heathkit*
SUPERHETERODYNE

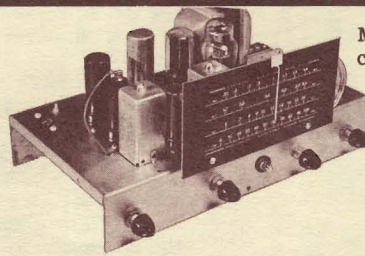
RECEIVER KITS



Model BR-1 Broadcast Model
Kit covers 550 to 1600 Kc.

Shipping Wt. 10 lbs.

\$19.50



Model AR-1 3 Band Receiver Kit
covers from 550 Kc. to 20 Mc.

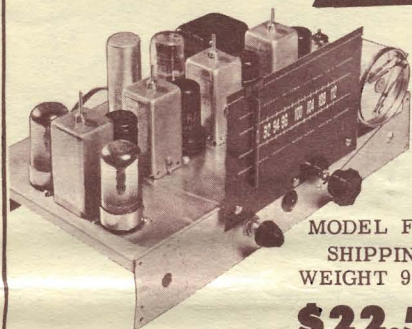
Shipping Wt. 10 lbs.

\$23.50

The AR-1 "All Wave Receiver" covers three bands—broadcast, police, and short wave—coverage is from 550 Kc to 20 Mc. Tube lineup is as follows: 1626 (or 12J5) oscillator, 12SH7 mixer, 12SH7 IF amplifier, 12C8 second detector and audio amplifier, 12A6 audio output, and a 5Y3 rectifier.

The BR-1 "Broadcast Receiver" covers the broadcast band (550-1600 Kc). It utilizes a 12K8 mixer oscillator and the same IF amplifier, detector and amplifier, audio output, and rectifier stages as does the AR-1.

Both receivers have full AVC action fed to two stages, and inverse feedback to the audio output stage for improved frequency response. Tuning is easy with the dial drum tuning assembly and the 6 inch calibrated slide rule dial provides easy reading. The receivers also have two IF transformers, power and output transformers, complete provisions for phono operation (including phono motor outlet), completely punched and formed chassis, all tubes, and all other parts (less cabinet and speaker). Instruction manual makes construction procedure simple and clear.



MODEL FM-2
SHIPPING
WEIGHT 9 LBS.

\$22.50

Heathkit F.M. TUNER KIT

Do you have an AM receiver or an amplifier and wish that you could enjoy FM reception? You can!!! The Heathkit FM tuner will provide the answer. The FM tuner utilizes eight tubes: A 7E5/1201 oscillator, a 6SH7 mixer, two 6SH7 IF amplifiers, a 6SH7 limiter, two 7C4/1203A discriminator diodes and a 6X5 rectifier—and the entire unit is transformer operated thereby making it safe to use with AC-DC receivers and amplifiers. Three high quality IF transformers and a discriminator transformer are furnished as well as all other parts to make the unit complete. The construction manual tells you exactly how to build the kit.

RESISTORS USED IN HEATHKITS

Many Heathkit users have undoubtedly soldered the resistors furnished into the circuits without paying too much attention to their type and without concerning themselves as to their characteristics. In the selection of resistors for their kits, however, the Heath Company has made use of the most recent developments in the resistor field, and many Heathkit builders might like to know something about the properties of the resistors now used.

Where extreme accuracy is not required, because of their low cost, small size, wide range of resistance value, and general availability, carbon composition fixed resistors are the most widely used in general circuitry for resistance values from 10 ohms to 20 megohms at ratings from $\frac{1}{4}$ to 2 watts. All radio-men are familiar with this type of resistor.

However, precision resistors, used in circuits where great accuracy is needed, are newer to the industry and a little information concerning this type should be of interest. Until recently, wire-wound resistors have been the only ones acceptable where closer tolerances, higher stability, and a lower temperature coefficient, were required. Accurate wire-wound resistors are large in size and high in cost, but their D.C. electrical performance is good, and the characteristics common to carbon composition resistors—instability and noise—are generally absent.

In recent years, much effort has been directed toward high-stability, high temperature, non-wire wound resistors. The three new types of resistors namely, metal film, deposited-carbon and boro-carbon combine and stability and accuracy closely approaching wire-wound resistors, and the small size and low cost of carbon composition resistors. The first one of this type, the "deposited carbon" resistor, —is now made in quantities by the Wilkor Corporation, Cleveland. They are composed of very thin conducting films of microcrystalline carbon deposited over surfaces of ceramic cores by thermal decomposition of hydrocarbon gases or vapors. The thickness of the film determines the minimum resistance value; the film is then machine spiralled to fix higher values. This type resistor has a maximum safe surface temperature of 120°C for continuous operation, but may be protected by special coating materials which will extend this to 200°C.

Metal-film type resistors make possible a high-stability, miniaturized component. Some of these de-rate to 0 power at 85°C. Others are for 150° applications. As made by Continental Carbon, Inc., Cleveland, the resistor is composed of a film of metal resins which is fired on a ceramic base, coated with a vitreous enamel, and refired. The ends are then silvered, and the lead wires are either soldered on or end caps containing the lead wires are pressed on. The resistance path is spiralled through the enamel and metal film to increase the resistance and for final calibration before the final protective coating is applied.

Recently the "boro-carbon" resistor—an improved modification of the deposited carbon type—has gone into production. In this type, boron as well as carbon is deposited in a thin film on a suitable ceramic core. The temperature coefficient of resistance range is improved by adding boron to the carbon film.

All these new types of resistors can be calibrated to 1 per cent of the specified value and will remain stable over a long period of time. The vitreous enamel covers give greater protection from damage caused by handling and assembly. During production, minor slips of tools during assembly do not change the calibration.

The resistance of these new resistors depends upon the thickness of the film. Accurate control of this thickness is not important, however, as final calibration is provided by the spiraling process which determines the length of the resistance path.

