electronics

BUYERS' GUIDE ISSUE

JUNE 1947 MID-MONTH

INCLUDING A DIRECTORY OF ELECTRONIC AND ALLIED PRODUCTS

PRICE TWO DOLLARS
Foremost Manufacturers of Transformers to the Electronic Industry

United Transformer Corp.

150 Varick Street
New York 13, N.Y.

Export Division: 13 East 40th Street, New York 16, N.Y., Cables: "ARLAB"
FEDERAL MAKES:

ELECTRONIC TUBES
SELENIUM RECTIFIERS
HIGH-FREQUENCY WIRE AND CABLE
TRANSFORMERS AND REACTORS

TELEPHONE AND TELEGRAPH CARRIER SYSTEMS
MOBILE FM RADIOTELEPHONE SYSTEMS

--- AND A COMPLETE LINE OF:

FM AND AM BROADCAST EQUIPMENT
NAVIGATION AND COMMUNICATION AIDS FOR AIRCRAFT
TELEPHONE SWITCHING EQUIPMENT

...it's your assurance of performance and dependability in all Federal products

Behind the familiar Federal trademark, is IT&T's world-wide manufacturing and operating organization, with 60 years of history-making achievement in all fields of communications and electronics. This background enables Federal to offer you the finest equipment available anywhere in the world—equipment which has proved its merit by years of manufacturing and operating experience.

Federal Telephone and Radio Corporation

AN IT&T ASSOCIATE
100 KINGSLAND ROAD, CLIFTON, NEW JERSEY

Complete Data on All Products Available on Request
**LECTRONIC TUBES for FM**

**7C26**
- Maximum output up to: 150 MC
- Maximum plate dissipation: 1000 Watts
- Filament voltage: 9 Volts
- Filament current: 28 Amp.
- Amplification factor: 17
- Mutual conductance: 20,000 Umhos
- Overall height: 4 1/4”; overall diameter: 2 1/2”
- Type of cooling: Forced air

**7C27**
- Maximum output up to: 110 MC
- Maximum plate dissipation: 3000 Watts
- Filament voltage: 16 Volts
- Filament current: 28.5 Amp.
- Amplification factor: 30
- Mutual conductance: 20,000 Umhos
- Overall height: 8”; overall diameter: 3 1/2”
- Type of cooling: Forced air

**Kw Transmitting Triode - 9C26**
- Maximum output up to: 150 MC
- Maximum plate dissipation: 1000 Watts
- Filament voltage: 9 Volts
- Filament current: 28 Amp.
- Amplification factor: 17
- Mutual conductance: 20,000 Umhos
- Overall height: 4 1/4”; overall diameter: 2 1/2”
- Type of cooling: Forced air

**Kw Transmitting Triode - 9C27**
- Maximum output up to: 110 MC
- Maximum plate dissipation: 3000 Watts
- Filament voltage: 16 Volts
- Filament current: 28.5 Amp.
- Amplification factor: 30
- Mutual conductance: 20,000 Umhos
- Overall height: 8”; overall diameter: 3 1/2”
- Type of cooling: Forced air

**9C28**
- Water Cooled
- New triodes for 50 Kw transmitters
- With THORIATED TUNGSTEN FILAMENTS

**9C29 and 9C30**
- Forced Air Cooled
- DATA FOR WATER-COoled TYPES
  - **9C28**
    - Filament voltage: 15 Volts
    - Filament current: 135 Amp.
    - Maximum Ratings
      - Plate voltage: 15,000 V
      - Plate current: 10 Amp.
      - Plate input: 100 Kw
      - Plate dissipation: 40 Kw
      - Overall height: 26”
    - Type of cooling: water cooled
  - **9C30**
    - Filament voltage: 15 Volts
    - Filament current: 135 Amp.
    - Maximum Ratings
      - Plate voltage: 15,000 V
      - Plate current: 10 Amp.
      - Plate input: 100 Kw
      - Plate dissipation: 40 Kw
      - Overall height: 26”
    - Type of cooling: water cooled

**9C31**
- Forced Air Cooled

**F-857-B**
- Mercury Vapor Tube
- Filament voltage: 5 Volts
- Filament current: 30 Amp.
- Maximum peak current: 40 Amp.
- Maximum peak inverse voltage*: 22,000 Volts
- Overall height: 28”; overall diameter: 7 1/2”
- Type of cooling: temperature-regulated forced air cooling

**9C23**
- Water Cooled
- New triodes for 50 Kw transmitters
- With THORIATED TUNGSTEN FILAMENTS

**9C24**
- Forced Air Cooled

**9C25**
- Power Triode
- Filament voltage: 11 Volts
- Filament current: 27.5 Amp.
- Maximum ratings for max. frequency of 50 MC
  - DC plate voltage: 15,000 Volts
  - DC plate current: 4.0 Amp
  - Plate dissipation: 20 Kw
  - Overall height: 26”
  - Type of cooling: water cooled

**9C26**
- Power Triode
- Filament voltage: 22 Volts
- Filament current: 82 Amp.
- Maximum ratings for max. frequency of 20 MC
  - DC plate voltage: 15,000 Volts
  - DC plate current: 4.0 Amp
  - Plate dissipation: 20 Kw
  - Overall height: 26”
  - Type of cooling: water cooled

**FTR 9-A-1**
- Single channel carrier
  - Gives one additional speech channel over existing open wire lines.
  - Normal range - up to 300 miles without repeaters.

**FTR 9-B-1**
- Three channel carrier
  - Gives three additional speech channels over existing open wire lines.
  - Normal range - up to 200 miles without repeaters.

**FTR 9-C-1**
- Speech-Plus-Duplex Telegraph Carrier
  - Gives duplex teleprinter channel over telephone or radio circuit (two over carrier telephone channel) retaining speech facilities - up to 100 words per minute - distortion minimized by frequency modulation.

**Mobile FM**

Federal's Mobile 2-way and 3-way FM Radiotelephone equipment offers the last word in convenience and economy for police and fire departments, taxicabs, buses, and service cars of all kinds. Finer static-free operation, and better coverage, mean closer coordination, faster action in emergencies. All models available with selective calling, which enables headquarters to contact any one car in the fleet—or all cars at once. Small size, interchangeable unit construction, and low battery drain hold operating and upkeep costs to the minimum.

Now, by using Federal's mobile radio-telephone units to tie-in with telephone operating companies—personal and professional cars can have regular telephone service wherever they go!

**Mobile Units** - Transmitter and receiver sections slide in and out like a desk drawer—can be replaced in a matter of minutes. Complete with tubes and crystals, battery and central cables, antenna, dashboard control, microphone and speaker or telephone handset. 25 to 50 watts RF output, 30-44 MC to 152-162 MC.

**Stacked Model**
- 12” high, 9 1/2” wide, 13 1/4” deep

**Side-by-side Model**
- 6 1/2” high, 17 1/4” wide, 13 3/4” deep
FTR 9-D-1
Voice Frequency Telephone Repeaters
Permit extending range of telephone lines by amplifying attenuated signals. Complete intermediate or terminal repeaters available in any combination of components—to meet all operating requirements, for 2-wire or 4-wire cable or open-wire circuits. Component parts obtainable separately, or rack-mounted and completely wired.

FTR 9-F-1
Single-Channel Carrier, Second Story
Gives one additional speech channel on top of existing single channel carrier system. Similar to 9-A-1, but operates at higher frequencies. Normal range—up to 200 miles without repeaters.

This complete line of Federal carrier systems offers you 5 ways to increase circuit capacity without the expense and delay of new line construction. Features include—hermetically sealed units, compact construction, flexibility of operation, ease of installation, and service-proved dependability.

Central Station Transmitters
Compact construction, with full length hinged doors at front and back, simple to operate and maintain. Complete electrical and mechanical interlocks are designed to assure safety of operating and maintenance personnel. Available in 50 watt and 250/350 watt power outputs for the 30-44 MC range, and in 25 watt or 250 watt outputs in the 152-162 MC range. Cabinet size —66¾" high, 22½" wide, 15¾" deep.

Deluxe Remote Control Console
Federal's remote control console is available for remote operation of the central-station transmitter at distances up to 20 miles, over a single pair of telephone lines. Consoles can be supplied complete with modern all metal desk and cabinet assemblies. For use where transmitter and antenna can not conveniently be installed at the dispatchers' headquarters.

SELENIUM RECTIFIERS
- Miniature Selenium Rectifier 403D2625
  Designed to replace the rectifier tube in radio and television receivers and many other types of electronic circuits—simplifies design and construction, gives longer life, eliminates transformers. And it's smaller than a tube, reduces weight and cost, and is practically unbreakable. Size ¾" x 1¾" x 1¾" 130 volts max., 100 ma DC.

New Heavy-Duty Stack
For use in equipment where heavy DC loads must be supplied from an AC source. Double mounting studs for increased rigidity; double current-collection points, for higher current capacity; double center-contact construction, for increased resistance to corrosion. Maximum reverse voltage, 26 volts per plate. Unusually resistant to shock and vibration.

D-C Power Supplies
Designed to furnish a dependable and constant source of D-C power for industrial or laboratory use. Standard equipments available in ratings from 1 to 50 amp. DC, at 2 to 115/230 volts.

General Purpose Battery Chargers
Available in 14 standard ratings—for charging batteries of from 3 to 24/48 cells, at from 1 to 40 amp. DC. Operate from 1-phase 115 or 115/230 volt AC power source.

Industrial Truck Battery Chargers
Compact heavy-duty equipments, with automatic "high" and "low" charging rates. Standard ratings for charging 6 to 12-18 lead cells and 10 to 13-25 Edison cells, at from 50-15 to 200-50 amp. DC.

Central Station Battery Chargers
Fully automatic or manually-controlled equipments, with "high" and "low" charging rates. Standard ratings for charging banks of up to 60 cells. Operate from 115/230 volt, 1-phase AC power source.

Telephone Battery Chargers
Filtered, automatically-controlled equipments keep batteries fully charged at all times. Eleven standard ratings, for charging 12 to 60 cells, DC outputs range from 2.4 to 16 amp.

Electroplating Equipments
These heavy-duty equipments have efficiencies of more than 70% at full load, for minimum operating costs. Instant starting eliminates stand-by losses. Available in basic standard equipments with DC outputs of 500 amp. at 6 volts, and 2000/1000 amp. at 6/12 volts.

Cathodic Protection Equipments
Outdoor-type units provide direct current for protecting underground pipes, cables or metal structures against electrolytic corrosion. Standard equipments available in ratings from 2 to 50 amp. DC.

All of these equipments are powered by Federal Selenium Rectifiers. Unit stacks or complete equipments—all offer the advantages of low-cost power conversion, practically unlimited life, quiet operation, and Federal's exclusive Center Contact construction—made by America's oldest and largest manufacturer of Selenium Rectifiers.
TRANSFORMERS and REACTORS

Federal offers you a complete range of transformers and other iron-core magnetic components for all radio, electronic and industrial applications—from audio transformers of a few milliwatts to power supply transformers of 2.5 kilowatts.

Custom-built components—designed by Federal to meet your individual needs—assure you of the finest performance, the utmost dependability—backed by 38 years of engineering and production know-how. Production facilities are available for producing custom-built units in quantities of 5000 or more.

Typical transformer and reactor types are illustrated here.
A. Open-frame type—minimum weight, for installation in enclosed equipment.
B. Enclosed type—dust-tight and moisture-resistant construction, suitable for most built-in applications.
C. Semi-enclosed type—only core laminations are exposed, for maximum cooling efficiency.
D. Standard semi-enclosed power transformer, with flexible cable leads.
E. Small hermetically-sealed audio transformer with glass bead terminals fused into cover. Maximum resistance to moisture and corrosion.

HIGH FREQUENCY CABLES... Low-Loss, Flexible Type

Federal's "Intelin" cables, for high-frequency transmission lines and antenna lead-ins, are skillfully engineered and manufactured to assure minimum attenuation losses—maximum uniformity and dependability. They're extra flexible, too—and have outstanding resistance to abrasion, weathering and corrosion.

COAXIAL cables with single inner conductor, dielectric material, one or two copper braids, and a synthetic-resin outer jacket—and, in some cases, a protective armor of metal braid.

COAXIAL AIR-SPACED cables, designed for low capacitance. Similar to solid-dielectric types, except that air is made a portion of the dielectric.

DUAL TWINAX cables, similar to solid-dielectric types, except with two accurately-spaced inner conductors.

DUAL COAXIAL cables—consist of two single-conductor coaxial lines, encased in an overall braid and outer protective jacket.

SPIRAL DELAY, HIGH IMPEDANCE LINES—have an inner conductor spiral-wrapped around a central dielectric core, covered with dielectric, wire braid, and outer jacket.

ANTENNA LEAD-IN WIRE—two accurately-spaced conductors, enclosed in an extruded dielectric of elliptical cross-section. For FM and Television receiving equipment.

OTHER FEDERAL WIRE PRODUCTS include: Building wire—Hook-up and Appliance Wire—Inside Telephone Wire—Distributing-frame Wire—Telephone Drop Wire—Aircraft Antenna Wire for Suppression of Precipitation Static.

Industry has found in the various types of Fenwal THERMOSWITCH* Controls the answer to the problem of correct Temperature Control and Detection. Fenwal THERMOSWITCH Controls are available in many models for countless applications of Temperature Control and Detection.

<table>
<thead>
<tr>
<th>HEX HEAD</th>
<th>JUNCTION BOX—</th>
<th>CARTRIDGE TYPE 17000</th>
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<tbody>
<tr>
<td><strong>Series 17100</strong></td>
<td><strong>Air</strong></td>
<td>The Cartridge Thermoswitch Control is the basic unit of most THERMOSWITCH models. Available types with temperature ranges of -100°F to +400°F, and +100°F to +600°F. The Series 17000 and 18000 THERMOSWITCH Controls provide a compact, lightweight, rugged unit which is highly sensitive. Other series are available for specialized applications.</td>
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<tr>
<td><strong>Series 17200</strong></td>
<td><strong>Series 17700</strong></td>
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<td><strong>Series 17300</strong></td>
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<td><strong>Series 17500</strong></td>
<td><strong>Series 30000</strong></td>
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</table>

The many modifications and special features available provide for almost every application of Temperature Control and Detection.

A copy of the complete Fenwal catalog will be sent upon request.

* THERMOSWITCH is a registered trade-mark designating thermal responsive controls or switches made exclusively by Fenwal Incorporated.
64A Transcription Turntable incorporates exclusive features which are of great interest to the broadcast station. The Turntable is directly gear driven at both 33 1/3 and 78 rpm. A separate motor is employed for each speed. Error in total speed regulation is completely absent, and mechanical disturbance is reduced to a new minimum. Change in speed is accomplished by turning a double throw mercury switch—the usual mechanical shift is eliminated. At 33 1/3 rpm, full speed is attained within about one-twelfth revolution.

The 8D and 8D-G Recorders (16") are similar in many respects. The 8D is a conventional rim driven unit while the 8D-G is directly gear driven at both 33 1/3 and 78 rpm, employing a separate motor for each speed. Total speed error in the 8D-G is completely eliminated. The recorder itself which is common to both models is of unusually heavy construction and includes such features as a cantilever type overhead, reversing gear on the feed screw, and belt driven feed drive with seven different feed pitches. Presto automatic equalizer and microscope are included.

You've got to be GOOD if you want to be first!

With every engineer it’s the performance that counts. That’s the reason engineers acknowledge that Presto is first in the recording equipment field. This is true because Presto has a record of many firsts in creative engineering, and because that creative engineering is so well translated into enduring equipment through precision manufacture.

We let this record speak for itself when we describe our equipment to engineers through the printed word. When you add up the facts you’re bound to reach this same conclusion: Engineers prefer Presto for performance.

Presto Recording Corporation
World's Largest Manufacturer of Instantaneous Sound Recording Equipment & Discs
1-D Cutting Head provides stability, uniformity, and sensitivity with low distortion for recording transcriptions having specified response characteristics such as flat, NAB, etc. Response: 50-10,000 cps. Cross-over at 500 cps. -Response and level not affected more than ±2 1/2 db between 60° and 95° Fahrenheit.

The 90-A Portable Recording Amplifier unit incorporates the following: three channel mixing preamp. and line input—response: NAB, 78 rpm, and flat (30-15,000 cps)—high and low frequency equalizers—outputs for one or two turntables or a line.

88A Recording Amplifier is a 50 watt amplifier with a frequency response of 20 to 17,000 cps. Both flat and NAB characteristics may be had by turning a switch. Used direct, gain is 85 db; bridging input, 70 db. This amplifier will handle program level peaks without undesirable distortion.

8N Recorder (16") is well known to broadcast and recording engineers. It is a rim driven unit employing a heavy cast iron turntable and an overhead mechanism of unusually solid construction which is driven from the center of the turntable. Change of feed pitch and direction is accomplished by changing feed screws.

6N Recorder (16") has proven ideal for most broadcast stations and recording studios because of its high quality and relatively economical cost. It is supplied in carrying case for portable and remote assignments as well as in a cabinet. Its design is of the conventional rim driven type with overhead feed mechanism.

62A Transcription Turntable has been widely used by broadcast stations and recording studios during the past five years. It is rim driven through a machined rubber tire at the outer diameter of the turntable, providing a very simple and quiet drive.

The Y Recorder (16") is the lightest portable recorder having all the features necessary for high quality recordings. The turntable is driven by a synchronous motor using a machined rubber tire on the outer diameter of the turntable. The 10 watt amplifier is equipped with two microphone inputs, connections for double turntables, high and low frequency equalizers and 10" speaker.

K8 Recorder (12") is complete with amplifier and speaker; operates at both 78 and 33 1/3 rpm, outside-in and inside-out. It is equipped with a high frequency equalizer. Fifteen minutes of voice quality may be recorded on a single side of a 13 1/2" disc. This unit is used by many schools, colleges, broadcast stations and recording studios.

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More than a decade ago, Presto developed the first lacquer-coated recording disc. Today Presto's instantaneous recording and master discs are the finest known to the trade.
PERMANENT MAGNETS MAY DO IT BETTER

Here
Permanent Magnets are Designed

Here permanent magnets are functionally designed and manufactured to meet exacting specifications for more efficient and economical performance of the device or instrument they serve.

This Is No Secret Formula...

The chart shows the typical demagnetization and energy product curves on which our engineers base their calculations. It shows the characteristics of various kinds of permanent magnet materials which can be expected in our production, and from which the optimum designs can be determined. Such fundamental information permits us to engineer the inside of your magnet so that each one will give you a maximum result.

ALNICO (Cast and Sintered) • CUNICO • CUNIFE • VECTOLITE • SILMANAL

Watch for Indalloy

The Indiana Steel Products Company offers you the advantages of the largest facilities in the world for the manufacture of permanent magnets and complete permanent magnet sub-assemblies.

For Results!

THE INDIANA STEEL PRODUCTS COMPANY
PRODUCERS OF "PACKAGED ENERGY"
6 NORTH MICHIGAN AVENUE • CHICAGO 2, ILL.

SPECIALISTS IN PERMANENT MAGNETS SINCE 1910
PLANTS • VALPARAISO, INDIANA
• STAMFORD, CONN.
Here's why leading phono manufacturers prefer —

**WALCO NEEDLES**

Standard Original Equipment with Leading Phonograph Manufacturers

**COMPLETE FACILITIES** for the manufacture of sapphire and metal points to any specifications include the smallest Swiss screw and stamping machines, microscopic grinding and finishing. Strict quality control throughout.

**NEEDLES FOR SPECIAL SETTINGS** can be made from your blueprints. The WALCO engineering staff will gladly work with you on individual problems — your inquiries are invited. WALCO needles are a product of ELECTROVOX COMPANY, INC., NEWARK 2, NEW JERSEY.

All Walco points are hand ground and polished to within plus or minus 2/10,000 inch of specified radius. Every point is micro-inspected for flaws, contour and perfect polish.

**MR. ROY DALLY**

Chief Engineer, heads the WALCO research staff. A recognized authority on phono needle and pick-up design, and author of many authoritative papers on the subject, he is available to help solve manufacturers' problems.

The Choice of Leading Phono Manufacturers—Scientifically Designed for Music at its Best!
Here’s some


D61A FREQUENCY RECORD: For direct checking of response characteristics of phonograph pick-ups and indirect checking of sound equipment. Duplicate recording, 2 sides. Flexible, non-breakable Vinylite.


“UNIVERSAL”

A132 RECORDING HEAD: Superior for home use. Accentuates high frequency range to compensate for losses common to home recordings and R.F. circuits. Assures sparkling tone. No special adjustments.

D97B RECORDING MECHANISM: Specially designed for manufacturers of home recording sets. Pantographic movement, tangent head, and other exclusive features. Range: 50-5000 cps. Requires only ½ watt.

be sure to specify

UNIVERSAL MICROPHONE CO.
424 Warren Lane  Inglewood 1, California

June, 1947 — MID-MONTH — ELECTRONICS BUYERS’ GUIDE
At Your Service
to help you with your

SHEET METAL
FABRICATION REQUIREMENTS

SHEET METAL PRODUCTS—such as:
INSTRUMENT PANELS, RADIO COMMUNICATION CASES and ENCLOSURES, OSCILLATOR BOXES, CHASSIS and CABINET ASSEMBLIES, RACKS and SPARE PARTS BOXES, WATERPROOF CABINETS and BOXES, METAL STAMPINGS, FORMING and WELDING of FERROUS and NON-FERROUS METALS.

We specialize in RADAR and RADIO COMMUNICATION METAL PRODUCTS. "Whistler and Wiedermann Setups" used for economic and speedy production.

We can assure you of excellent workmanship and prompt deliveries. Send us your blueprints and specifications. We shall quote you immediately.

Our additional facilities enable us to solicit your inquiries regarding SCREW MACHINE ITEMS and GENERAL MACHINE SHOP PRODUCTS.

S. WALTER CO.
PRECISION SHEET METAL PRODUCTS
144-146 CENTRE STREET BROOKLYN 31, N. Y.
Telephone, MAin 4-7395
NATIONAL LAMINATED PLASTICS
PROVIDE THE ELECTRONICS INDUSTRY
WONDERFUL OPPORTUNITIES FOR
PROFITABLE, EFFICIENT PRODUCTS

NATIONAL and the electrical industry have grown hand in hand. Back in 1873, National Vulcanized Fibre as an insulation material helped the budding electrical industry emerge from its embryonic stage into a full-fledged economic necessity. In 1901, National developed Peerless Insulation, the first fish paper, a "must" since that time for electrical insulation.

With the development of Bakelite resins, it was only natural that National, with its broad experience in laminated plastics, should produce Phenolite, which has become a standby in the electrical industry. Thus, National offers three superior materials for electrical insulation which are helping to create better, more efficient and more economical products.

National Vulcanized Fibre, a tough, hornlike material, possesses excellent electrical properties and great mechanical strength. It is a converted cotton cellulose which is chemically changed into a new structural form having high dielectric strength, excellent machinability, good forming qualities, great resistance to wear and abrasion, long life and light weight. Standard colors are red, black and gray—in 15 basic grades. (Send for further literature)

Phenolite, Laminated Plastic, is bonded into its primary forms—sheets, rods, and tubes—under heat and pressure. It has an unusual combination of properties ... a good electrical insulator, great mechanical strength, high resistance to moisture; ready machinability. Standard colors are natural, black and chocolate; mirror, semi-gloss and dull finishes. (Send for further literature)

Peerless Insulation, the first fish paper—developed for electrical insulation and accepted by the industry because it is strong, smooth, flexible and has excellent forming qualities. It is uniform in thickness; has high dielectric strength. Made in sheets, rolls and coils in all practical widths and thicknesses.

Experimental service is offered from our research laboratories. National Service Engineers will, without obligation, assist you in employing National Laminated Plastics to your best advantage.

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
SIGMA Instruments, Inc., fully guarantee the performance of any relay they manufacture. You can buy SIGMA relays in confidence knowing they will serve long and well.

<table>
<thead>
<tr>
<th>Type</th>
<th>Dimensions</th>
<th>Weight</th>
<th>Recommended for</th>
</tr>
</thead>
<tbody>
<tr>
<td>4F</td>
<td>$1\frac{1}{8}\times1\frac{3}{8}\times1\frac{1}{8}$</td>
<td>25/32 oz.</td>
<td>Light Weight, High Speed, Moderately severe environment (temperature and vibration), Moderate Sensitivity, Minimum input power 10 milliwatts, Coil resistance up to 14,000 ohms.</td>
</tr>
<tr>
<td>5F</td>
<td>$1\frac{1}{8}\times1\frac{3}{8}\times1\frac{1}{8}$</td>
<td>35/32 oz.</td>
<td>Exceptionally severe environmental conditions, Maximum Sensitivity, Minimum input power 0.5 milliwatts, Coil resistance up to 18,000 ohms.</td>
</tr>
<tr>
<td>41F</td>
<td>$1\times1\frac{1}{16}\times2\frac{3}{16}$</td>
<td>25/32 oz.</td>
<td>Critical performance requirements at a low price in high volume applications. Features of other SIGMA Relays not needed in these applications have been omitted. Minimum input power 20 milliwatts, Coil resistance up to 14,000 ohms.</td>
</tr>
<tr>
<td>41RO</td>
<td>Only $1\frac{1}{4}\times1\frac{1}{8}\times1\frac{13}{16}$</td>
<td></td>
<td>In addition to their regular mounts, all series 41 Relays are now available in an octal (8 prong) mount for standard radio sockets.</td>
</tr>
</tbody>
</table>

Adaptable

All relays are obtainable unenclosed or in a variety of enclosures, including hermetically-sealed. Sample orders filled promptly. Components are on hand to be assembled to your requirements.

Specialized Types Available

SIGMA can supply extra sensitivity, DC sensitivity on AC current, time delay, and other special features.

Send SIGMA your relay problems for competent solutions.
ECONOMICAL—K-TRANS cost less to purchase—less to use.

EFFICIENT—K-TRANS will duplicate or exceed the performance of your present i.f. transformers.

STABLE—Permeability tuning, magnetic shielding of windings, silver mica condensers combine to give a stability never before obtainable in a standard commercial i.f. Transformer.

VERSATILE—Four models of K-TRAN meet all 455 KC requirements. Also available for 262 K.C., and 10.7 M.C. for F.M. receivers.
AIRLOOPS

ARE BEING ADVERTISED DIRECT TO CONSUMERS

CHICAGO DAILY NEWS

The Sun

CHECK YOUR 1947 RADIO SET FOR MAXIMUM PERFORMANCE
it should be equipped with a

FRANKLIN AIRLOOP

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Publishers Exclusively for the Radio and Electronic Industry

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
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Typical Wiring Diagrams

CALIBRATING TAP

Figure 1 illustrates two separate loads wired to a single pole calibrating trip Circuit Breaker. Both load #1 and load #2 are disconnected when an overload occurs in load #1.

Figure 2 illustrates the use of a variable or fixed resistor in parallel with the trip coil to gain an adjustable variation in the rating or different fixed ratings giving a wide range of calibration of the tripping point. Numerable combinations can be obtained by use of 2 and 3 pole Circuit Breakers.

SHUNT TRIP

Figure 3 illustrates a shunt trip Circuit Breaker that can be tripped at some remote station.

Figure 4 illustrates a shunt trip Circuit Breaker that can be operated by an AC or DC relay operating a set of contacts upon which the line voltage is impressed. These Circuit Breakers must be reclosed manually.

RELAY TRIP

Figure 5 illustrates a relay trip Circuit Breaker protecting a transformer by limiting the current in the secondary. When the Circuit Breaker is tripped the primary of the transformer is open circuited.

Figure 6 illustrates a relay trip Circuit Breaker protecting a high voltage transformer by having the relay coil inserted between the two secondary windings at the grounded terminal. When the Circuit Breaker is tripped the primary of the transformer is open circuited.

Figure 7 illustrates a relay trip Circuit Breaker operated by an independent source of current, either AC or DC, and for voltages of 1 to 1000.

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FOREWORD

This is your Buyers' Guide—its contents and format determined by extensive survey among the subscribers to ELECTRONICS.

It is an extra—a bonus edition designed for service at your elbow throughout the next twelve months.

In it we are publishing the most complete directory, as to diversity of products, which has yet been presented.

In addition we have done an earnest job of preparing editorial reference material designed to help you repeatedly in your work.

Many advertisers have seen fit to utilize these pages to describe and catalog their products. It is our hope that this combination of buying-source listings, product advertising and reference material constitutes a service which will further strengthen our position with you, the subscriber.
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NOW is the time . . .
TO INCLUDE THE 1948-49
ELECTRONICS BUYERS’ GUIDE
IN NEXT YEARS’ ADVERTISING BUDGET
# Superior Voltage Control

**Bulletin 547**

**THE SUPERIOR ELECTRIC CO., BRISTOL, CONN., U. S. A.**

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With the rapid advancements and improvements in electrical apparatus the need for precise voltage control has become more and more critical. This bulletin will serve as your guide in selecting the correct POWERSTAT variable transformer to obtain continuously adjustable voltage from a-c power lines, a STABILINE voltage regulator to maintain a constant output voltage from fluctuating lines, and test instruments for variable voltage testing. If a voltage control problem is unusual, do not hesitate to consult the specialists in voltage control at The Superior Electric Company. Expert advice is available whether the application involves the control of heat, light, sound, or any phase of electronics or power.

A POWERSTAT variable transformer is an auto-transformer of toroidal core design with a movable brush tap which rotates to deliver a continuously adjustable output voltage from a-c power lines. Incorporated into each POWERSTAT are superior qualities of top electrical performance, rugged mechanical construction, compact design, and durability. The cut-away structural view of the type 20, together with figures 1 and 2, illustrate some of these features.

EXCELLENT REGULATION — negligible variation in output voltage from no load to full load current (Figure 1).

HIGH EFFICIENCY — at all output voltages (Figure 2) . . . Such is in contrast to the inefficient wasteful control offered by rheostats.

CONSERVATIVELY RATED — current ratings of all POWERSTATS is the current available over the entire range of output voltage. When operated at the nameplate rating, the temperature rise of POWERSTATS does not exceed 50 degrees centigrade under continuous full load current.

*POWERSTAT is the United States registered trademark of all Company. Licensed under U. S. Patent Number 2,009,013.

To facilitate ordering and as an aid in selecting the POWERSTAT variable transformer most suited to a particular voltage control requirement, representative photographs together with mounting and outline dimensions are shown on the following pages for each basic type. For ease of discussion, POWERSTATS have been grouped as to frame size. The basic frame sizes are the type 20; the 116 and 216; the 1126 and 1226; the 1156 and 1256.
POWERSTAT PERFORMANCE DATA

REGULATION CURVES
OUTPUT VOLTAGE VS. LOAD AMS
VARIABLE VOLTAGE TRANSFORMER
POWERSTAT H26
INPUT 115V, 60 CYCLES

LOAD CURRENT IN AMPERES

FIG. 1

EFFICIENCY
MODEL 1256 POWERSTAT
CONSTANT IMPEDANCE LOAD
LOAD CURRENT 22 AMP. AT 230 VOLTS

EFFICIENCY IN PERCENT

FIG. 2

PERCENT OF MAX. RATED OUTPUT AMPS.

CURRENT RATIOS OF ANY DUAL INPUT VOLTAGE POWER STAT OPERATING ON LOWER INPUT VOLTAGE, TAP

FIG. 3

POWERSTAT TYPE 20

Although the smallest in physical and electrical size of the entire POWERSTAT line, the type 20 is extremely durable. Reference to the cut-away view on page 2 shows the rugged radiator, brush assembly, coil locking arrangement, and mounting base. Its current rating of 3.0 amperes exceeds all other units of comparable mounting dimensions. Five terminals permit clockwise or counter-clockwise rotation for increasing voltage up to, or above line voltage. For three phase operation, type 20 can be ganged for wye or open-delta operation. All type 20 units are designed for back-of-panel mounting.
The popular types 116 and 216 find wide application in laboratories and throughout industry as the ideal source of continuously variable voltage for loads up to 1 KVA. In appearance and features both units are alike but the 116 operates on 115 volts while its companion, the 216, is designed for 230 volt operation. Both types are bench or wall mounted. Incorporated into each type is protective screening, output receptacle, "on-off" switch, input cord-plug, and a fuse in the output lead for instrument protection. Standard units are furnished to deliver an output voltage 17.5 percent above line but the output voltage can be limited to line voltage when so specified. This is known as an "L" type connection. Type 216 can be connected at the factory, if the user desires, to operate from a 115 volt source to deliver 0-270 volts output. With this type of connection, the allowable output current must not exceed the currents shown in figure 3.

When types 116 and 216 are to be back-of-panel mounted, the screening, output receptacle, "on-off" switch, input cord-plug, and fuse are not supplied. To differentiate these uncased units from the cased bench-mounting types, the letter "U" follows the type number. Types 116U and 216U differ also from the 116 and 216 in that the turning shaft protrudes from the base mounting end. If it is desirable to have types 116U and 216U with the turning shaft extended from the commutator end, models 116U1 and 216U1 should be ordered. Connection to the uncased models is easily made by removing the terminal cover and soldering to the correct terminal lugs. Clockwise or counter-clockwise rotation for increasing voltage up to or above line may be obtained.

POLYPHASE OPERATION... Types 116 and 216 are tandem-mounted for series connection single phase and open-delta or wye connection three phase duty. Ganged assemblies are supplied with screening, dial and knob, but without fuse, output receptacle, "on-off" switch or input cord-plug. By providing a short shaft extension with ganged assemblies, bench mounting can readily be converted to back-of-panel mounting.

MOTOR DRIVES... All single and multiple types 116 and 216 can be adapted to motor operation. Speed of travel is shown on page 9.
Factory terminology refers to POWERSTATS types 1126 and 1226 as the 2 KVA frame size units. The versatility of connection and terminal arrangement of the 2 KVA series permits the selection of a standard unit from the rating chart to suit any application within the rating. When exposed terminal studs are required, type 1126 as illustrated, is supplied for 115 volt duty. Its companion, the 1226 for 230 volt operation, has the terminal board arrangement as shown in the tandem-mounted type MY1226-3Y. For greater voltage and current single phase requirements, units are tandem-mounted and series or parallel connected. To achieve three phase operation, units are ganged and open-delta or y connected. Type MY1226-3Y is a typical ganged assembly. All units in the 2 KVA series with exposed terminal studs can be obtained with motor-operators. Four standard travel times—6, 14, 19, and 45 seconds for full range travel—are offered to fulfill the needs of most requirements.

THE FUSED MODELS... For those users who do not wish to perform the task of connecting leads and desire a POWERSTAT of 2 KVA capacity with input cord-plug and output receptacle, models 2PF and 3PF are available. The 2PF model is designed for 2 wire service and the plug and receptacle are straight blade type. The 3PF has the straight blade type plug and receptacle but is used on a three wire system with the third wire solidly grounded to the POWERSTAT frame. If a twist-lock type plug and receptacle is desired, the letter "T" is substituted for "P". Instrument and user protection is assured on all models by a fuse in the output lead housed in the cast-aluminum terminal box. When fuse protection is desired without the input cord-plug and output receptacle feature, types F1126 and F1226 are offered. These models have the same terminal stud arrangement as types 1126 and 1226 but a fuse is mounted on the terminal board and a bakelite cover protects both fuse and terminal studs.
POWERSTAT TYPES 1156 - 1256

POWERSTAT is the tradename of all variable transformers manufactured by The Superior Electric Company; but, when referring to types 1156 and 1256, the "POWER" in POWERSTAT has a most significant connotation. Large amounts of power are controlled by the turn of a handwheel or by the finger-tip adjustment of a "raise-lower" switch. Type 1156 (the 115 volt unit) controls any load up to 45 amperes while the 1256 (the 230 volt unit) has a current rating of 28 amperes. To obtain greater single phase ratings, type 1156 is parallel connected in ganged assemblies as high as six individual units on a common shaft to deliver a variable voltage to load requirements up to 270 amperes. Type 1256 when parallel connected in a six gang assembly offers a variable output of 0-270 volts at 168 amperes. For 440 volt single phase duty, type 1256 is available in a series-parallel connection in mountings up to six gang to deliver an output of 0-515 volts at 84 amperes. This series-parallel connected type 1256 is catalogued as type 1256-6PS.

Three phase applications enjoy the same high degree of versatile connection arrangements. Type 1156 is open-delta connected for 115 volt operation and wye connected for 230 volt duty. The same connections are employed for 230 and 440 volt service with type 1256. Individual applications dictate the number of units that must be paralleled on each leg of the three phase connection to achieve the required current capacity. When motor-driven units are better suited to the needs of a particular application, the single units and up to three ganged assemblies are available in speeds of 6, 14, 19, and 45 seconds for full range travel. Although all ganged assemblies can be supplied for manual control, it is recommended that units of four gang and larger be motor driven. These POWERSTATS have standard speeds of travel of 14, 19, and 45 seconds.

The terminal board arrangement of type 1256 is illustrated in the photograph. Motor-driven POWERSTAT type MW1156L-3Y shows the terminal arrangement of type 1156 and the compactness of a three gang motor-driven assembly.

MW1156L-3Y
1256
MOTOR-DRIVEN POWERSTATS... Many applications require that POWERSTATS be controlled from remote push-button stations or by automatic controllers. For these requirements, a standard line of motor-driven POWERSTAT variable transformers is available in the same capacities as manually operated units. To offer the same control as obtained with handwheel adjustment, a special three wire synchronous motor is used to drive the POWERSTAT. It consists of two windings with externally mounted capacitor and resistor. By employing the appropriate gearing combinations, various speeds can be obtained to suit each need. Standard speeds of travel from zero to maximum output voltage are listed in the rating table on page 9. The motor assembly operates from a 115 volt single phase source and the maximum current requirement is 4 amperes. The rotor shaft is ball-bearing mounted, assuring long life and quiet operation. Rapid starting and practically instantaneous stopping are inherent characteristics.

OIL-COOLED POWERSTATS... Space limitations and the atmosphere in which a POWERSTAT is to operate sometimes dictate the use of an oil-cooled unit. The capacity of POWERSTATS can be increased above normal air-operation when mounted in transformer oil. The amount of increase depends upon such factors as the type of POWERSTAT, quantity of oil, area of wetted surface, and type of container. Most POWERSTATS can be adapted to oil mounting but since applications vary extensively only single phase 0-116, 0-216, 0-1126, and 0-1226 types are available as standard. Type 0-1126 illustrated is a typical unit. Any problems regarding the use of oil-cooled POWERSTATS should be referred to the factory.

POWERSTAT LINE CORRECTORS... Where the wide output voltage range of a POWERSTAT variable transformer is not necessary, but relatively large amounts of power must be controlled, a POWERSTAT LINE CORRECTOR is recommended. As shown in connections 6 and 11 on page 8, a POWERSTAT type LC consists of a POWERSTAT, appropriately tapped, controlling the primary of a step-down fixed-ratio transformer. By rotating the brush element, different voltages are applied enabling the secondary, which is in series with one side of the line, to buck or boost the line voltage. POWERSTAT LINE CORRECTORS are ordinarily used for line voltage correction to obtain a nominal output voltage from varying power lines. These units may also be used on a constant voltage line to furnish an output voltage variable over a limited range at large current capacities. Pictorially shown is single phase type 2106LC.

VOLTBOX A-C POWER SUPPLIES

For variable voltage testing, it is desirable to have in addition to the essential POWERSTAT variable transformer, a voltmeter, circuit protection, and some means of quickly de-energizing the system. To collect each of these elements and carry to the place of test is an arduous task. A VOLTBOX a-c power supply contains all the components necessary for variable voltage testing in a compact portable black wrinkle-finished cabinet.

THE REGULATED MODEL

For testing from a stable single phase power source, an unregulated VOLTBOX is generally employed. This type consists of a POWERSTAT variable transformer, a large four inch easily-read voltmeter; combination quick-trip magnetic circuit-breaker and "on-off" switch; pilot light; output receptacles and binding posts; six foot cord and plug. Four types of unregulated VOLTBOXES are listed in the rating chart on page 9.

THE UNREGULATED MODELS

When variable voltage testing is required but the incoming line voltage fluctuates to such an extent that stable readings are impossible, some means of voltage stabilization must be placed in the line ahead of the VOLTBOX. The best procedure is to use a STABILINE voltage regulator type IE in conjunction with an unregulated VOLTBOX; however, many applications necessitate that the voltage stabilizer and variable voltage element be together in a self-contained portable cabinet. For these applications a regulated VOLTBOX should be used. This instrument is similar in every detail to the unregulated models except a transformer type stabilizer is included to provide the constant voltage feature. It will maintain the voltage supplied to the POWERSTAT in the VOLTBOX to within ± 1% of nominal for a total primary variation of 30 percent. As a word of caution, it must be remembered that the transformer type voltage stabilizer in the regulated VOLTBOX will not function with the same high degree of performance as experienced with the STABILINE voltage regulators.
A distinct advantage of the POWERSTAT variable transformer is the number of connection arrangements. This enables a POWERSTAT to offer a variable voltage to any circuit requirement. On this page are shown the various methods of connection. Connection 1 is the connection employed for 115 volt single phase units such as types 20, 116, 1126, and 1156. Types 216U, 1226 and 1256 have the connections as shown in connection #2 to offer a variable voltage from 230 or 115 volt lines. POWERSTAT type 216 must be connected for either 115 or 230 volt service at the factory. By tandem mounting these single phase units in a series or parallel connection, increased voltage or current ratings are obtained. The letter "S" or "P" is appended to the single unit type number to denote series and parallel connection, respectively. The number of units ganged in an assembly is noted by appending this number after the single unit type number together with the letter denoting the type of connection. Connection #3 illustrates series connected two gang assembly such as 1156-2S and connection #4 shows the same type of connection for any 230 volt single phase POWERSTAT. A parallel type connection is shown in connection #5. A combination of series and parallel connections is necessary to achieve certain voltage and current ratings. An example is POWERSTAT type 1256-4PS; a 440 volt unit which delivers an output of 0-515 volts at 56 amperes. Connections 7, 8, 9, and 10 show the three phase type connections. Individual units are ganged and open-delta or wye connected. By paralleling units on each leg of the three phase system, unusually large power controlling capabilities are possible. The letters "D" and "Y" following the basic type number together with the number of units in the assembly denote open-delta and wye connection, respectively. An example of an open-delta connected POWERSTAT is type 1126-2D (connection #7) and of a wye connected unit is POWERSTAT type 1256-3Y (connection #10).

Unless specified to the contrary, POWERSTATS are supplied as shown in the rating table. If the maximum output voltage must be limited to the applied voltage, an "L" type unit must be designated when ordering, except on the type 20 and uncased 1 KVA models. Above the line and "L" terminals are provided as standard on these latter types. For instance, where POWERSTAT type 1126 is required to deliver an output of 0-115 volts from a 115 volt source, type 1126L should be specified when ordering.

Although not listed in the rating chart, POWERSTATS are available in ganged assemblies with each unit electrically independent but mechanically coupled on a common shaft. Each unit in the assembly will have the single phase rating of that particular unit. The letter "E" together with the number of units in the assembly is affixed to the single unit type number to designate this arrangement.
**RATINGS**

**STANDARD POWERSTAT VARIABLE TRANSFORMERS**

<table>
<thead>
<tr>
<th>Type</th>
<th>Maximum Output Amps</th>
<th>Output Fre. Connection (see note 1)</th>
<th>Type</th>
<th>Approx. Ship. Speeds (see note 2)</th>
<th>Standard Motor (see note 2)</th>
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**POWERSTAT LINE CORRECTORS**

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<th>Output KVA</th>
<th>Type</th>
<th>Approx. Ship. Voltage (see note 1)</th>
<th>Standard Motor (see note 1)</th>
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<td>195-255</td>
<td>230</td>
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<td>50/60</td>
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<td>W,X,Y,Z</td>
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**OIL-COOLED POWERSTATS**

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<th>Type</th>
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<th>Standard Motor (see note 1)</th>
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<tr>
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<td>50/60</td>
<td>1</td>
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<tr>
<td>Three Phase</td>
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<td>150</td>
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<td>50/60</td>
<td>1</td>
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<td>230</td>
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<td>1.6</td>
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**VOLTBAX A-C POWER SUPPLIES**

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<th>Output KVA</th>
<th>Frequency</th>
<th>Type</th>
<th>Approx. Ship. Voltage (see note 1)</th>
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<td>1</td>
<td>U-2000</td>
<td>65</td>
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</table>

*When these POWERSTATS are "L" connected so that the output does not exceed the applied voltage, the frequency range is 50/60 cycles.*

†Values of maximum rated output current marked by the dagger apply to output voltage range from zero volts to 25 percent above input line voltage. For allowable output currents above this output voltage value, refer to figure 3 on page 3.

Note 1: If desired, POWERSTATS types 116 and 216 can be supplied with a three wire cord, plug and receptacle with the third wire grounded. To obtain this feature, prefix the letters 3PF to type numbers 116 or 216. On page 5 is explained the availability of types 1126 and 1226 with fuse protection, output receptacle and input cord-plug. When ordering, prefix the letters—F for fuse; 2PF, 3PF, for straight blade 2 or 3 wire types respectively; 2TF, 3TF, for twist-lock 2 or 3 wire types, respectively.

Note 2: When a motor-driven POWERSTAT is required, prefix the letters noted together with the letter "M" to denote motor drive and speed of travel. Letters noted are for time of full range travel from zero to maximum output voltage in seconds; T=5, W=45, X=19, Y=14, and Z=6. Since the driving motors are frequency sensitive, specify whether 50 or 60 cycle is required. Only manually operated POWERSTAT weights are listed; therefore, add 10, 11, and 14 pounds to the (116 & 216), (1126 & 1226), and (1156 & 1256) types, respectively when computing the weights of motor-driven POWERSTATS.
STABILINE automatic voltage regulators deliver a constant output voltage regardless of variations in input voltage or load current. Two distinct types of STABILINE automatic voltage regulators are available. One type referred to as the STABILINE INSTANTANEOUS ELECTRONIC regulator has no moving parts, and is completely electronic in operation. The other type known as the STABILINE ELECTROMECHANICAL regulator consists of an electronic detector circuit controlling a motor-driven POWERSTAT variable transformer. These basic differences in operation make it possible for STABILINE voltage regulators to meet the requirements of any problem in voltage regulation.

Since the electromechanical regulator has moving parts, its speed of correction of line voltage fluctuations can not compare to the instantaneous correction offered by type IE. Another important difference is the design feature of extremely close control offered by the IE unit. On the other hand, for large size regulators, where low cost and high efficiency are paramount considerations the EM regulator can not be equalled. The electromechanical type has zero waveform distortion while the type IE produces a very small amount of waveform distortion. It is readily seen that each application will indicate which STABILINE automatic voltage regulator is to be employed to maintain constant voltage.
To achieve instantaneous action with a waveform distortion not exceeding 3%—stable output voltage within ± .1 of 1% for wide line variations, the completely electronic STABILINE type IE automatic voltage regulator has been designed by The Superior Electric Company. The block diagram shows pictorially the method of operation. The desired output voltage may be selected by front-of-panel adjustment. When the output voltage varies from this preset value a signal from the voltage control circuit is supplied to the transformer regulating network. This network is connected between the input and output terminals of the regulator. The signal causes the effective transformation ratio between the input and output terminals to vary in the proper direction and magnitude to restore the output voltage to its preset value.

Referring to the chart which lists features of type IE regulators with respect to the input voltage range, output voltage range, frequency range, load current range, and power factor range; the maximum change in output voltage for any or all of these variations occurring simultaneously will not exceed ± .25 of 1%. For input voltage changes only, the change in output voltage will not exceed ± .1 of 1%. The response time depends upon the nature of the variation. Ordinarily complete correction is effected in from 3 to 10 cycles as shown in figures B and C. Distortion is usually considerably less than 3% as shown in figure A.

STABILINE type IE voltage regulators are available in attractive black wrinkle-finish cabinets.

All types except IE5105 may be ordered for standard 19” relay rack mounting by suffixing R to the type number.
ELECTROMECHANICAL REGULATORS

For maintaining constant voltage to large industrial loads or as a means of obtaining a constant output voltage with zero waveform distortion, the STABILINE type EM automatic voltage regulator is ideal. Some of its outstanding advantages are... zero waveform distortion, complete insensitivity to the magnitude and power factor of the load, no effect on system power factor, no critical adjustments, high efficiency and adjustable output voltage over a wide range.

The operating principle can easily be seen by referring to the block diagram.

STABILINE type EM regulators are available in various capacities obtained by combining the control circuit with a suitable power circuit. The attractive black, wrinkle-finish front panel has a 4 inch output voltmeter and screwdriver controls for sensitivity and output voltage.

The new control circuit shown is worthy of particular attention for it is representative of the latest advances being made in industrial control equipment.

Features include—small size, rugged construction, fast response, ability to operate in any position, performance unaffected by temperature changes, plug-in components, and other detailed refinements. In addition to the features listed above, the whole control circuit is mounted by inserting it into a female receptacle provided inside the cabinet. This plug-in feature combined with an exchange arrangement which will be explained by any representative of The Superior Electric Company, eliminates maintenance difficulties.

INFORMATION REQUIRED FOR QUOTING

Please supply the following information when requesting quotations or recommendations:

1. Frequency, number of phases, input voltage range, nominal input voltage, voltage unbalance between phases.

2. Nominal output voltage; output voltage range; load—current, KVA, balance, fluctuation.

3. Frequency and severity of line and load transients.

4. Special features such as finish, speed, mounting, extreme ambient temperatures, corrosive atmospheres, etc.

Note 1: Polyphase regulators are arranged so that all phases are regulated by control from one phase.

Note 2: STABILINE regulators are normally furnished for 60 cycle operation. If a regulator is needed for 50 cycle service, it may be ordered by inserting the letter "L" after the letters EM in the type number. (e.g. EM4106 is for 60 cycle operation, EML4106 is for 50 cycle use).

STABILINE VOLTAGE REGULATORS ELECTROMECHANICAL TYPE RATINGS

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<tbody>
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<td>C</td>
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<td>231/4</td>
<td>151/4</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

The correction rate is computed on the basis of input voltage range and regulator speed. The output voltage range is obtainable when the input voltage is equal to the specified nominal output voltage.

THE SUPERIOR ELECTRIC CO.
Bristol, Connecticut

ADDRESS YOUR VOLTAGE CONTROL INQUIRY TO 813 LAUREL STREET

PRINTED IN U.S.A.
Send for it! It gives full facts!

Get this story on G.A.&F. Carbonyl Iron Powders—the practical core material that can save you 60% of wire and 33% of weight on coils—yet give up to 170% higher “Q” values!

ELECTRONICS MANUFACTURERS

This free book can save money for you!

Just off the press, this book contains new facts that can profit every radio engineer and electronics manufacturer.

It tells about the amazingly efficient electromagnetic material, G.A.&F. Carbonyl Iron Powders. It quotes actual comparison tests between coils cored with this material and conventional air-cored coils. It shows how coils whose cores are made of this material can give up to 170% higher “Q”...40% greater inductance...at a saving of 80% of volume...60% of winding wire.

For radio engineers who want “reasons why,” it gives detailed characteristics of G.A.&F. Carbonyl Iron Powders, and tells where units made of this material can be used.

G.A.&F. Carbonyl Iron Powders are made in six different types. From them, core manufacturers can make units to your specification, in a wide variety of applications over the entire communication frequency range.

One major American radio manufacturer is using 40 units made from G.A.&F. Carbonyl Iron Powder in a single model. Get this book and see whether you too cannot gain better performance at lower cost. At the same time, get the book, “POLECTRON dielectrics,” describing G.A.&F.’s dielectric resin with special high-temperature and high-frequency advantages.

Clip out the coupon below and send it today.

G.A.&F. carbonyl iron powders

Mail this coupon today

ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH
HERE is a simple, silent, sealed-in-glass relay with an electrical heater instead of a solenoid to operate the contacts. It is small, light, and simple; works in any position at any altitude; is insensitive to transients; and has a long operating life. The glass envelope protects working parts from dust, dirt, corrosion, and tampering. An arc-quenching atmosphere within the envelope assures a minimum of contact fouling, pitting, or transfer. Standard 4-pin or octal radio tube base. Special mount and lead arrangements can be provided.

What This EDISON Relay Does — The EDISON Thermal Relay times, delays, or sequences over a wide range, operates continuously or intermittently, and offers consistency of operation over a long life. It compensates for ambients from $-60^\circ$ C. to $+70^\circ$ C. It is inexpensive and requires no maintenance.

How You Can Use It — A. To introduce a delay into a circuit. B. As an automatic timer or sequencer. C. To delay plate voltage application in thermionic tubes until the cathode is properly heated. D. To limit over- or under-current or voltage. E. For general control use instead of magnetic relays.

Some Specific Applications — The EDISON Thermal Relay is being used to: integrate pulses and intermittent current into accumulated heat energy to operate controls; control loads to eliminate magnetic relay chatter and resultant false starting; improve sensitive instrument contact operation by providing a resistive load without inductive surges that produce contact welding; continue or delay operation of certain elements after a main circuit is opened or closed. Typical controls include: blanket heaters, surface combustion heaters, motor starting and operating sequence, and cathode protection. Here is a relay that will stimulate your imagination because it will do so many different jobs so much better and cheaper than any other type of relay.

Sealed-in-Glass Thermostat

The EDISON Sealed-in-Glass Thermostat operates in an arc-quenching atmosphere, protected from dust, corrosion, and tampering.

Temperature settings are factory-fixed from $-90^\circ$ F. to $+600^\circ$ F.

Capacities are from $\frac{1}{2}$ to 8 amperes; 250 volts maximum. Contacts normally open or closed.

Operating Characteristics

1. Electrical Heater — AC or DC, deflects bi-metal to actuate moving contact.
2. Contacts — s.p.s.t., normally open or closed.
3. Spring Arm — Applies positive contact pressure immediately and noiselessly.
4. Contact Spacing Screw — Factory pre-set for desired operating time.
5. Compensating Bi-Metal — Supports contact; eliminates effect of ambient temperature variations on timing.
6. Cushioning Springs — Between ceramic support and glass envelope to absorb shocks.

Sensitive Magnetic Relay Operates on 30 MICROwatts Yet Stands Big Overloads

The EDISON Sensitive Magnetic Relay has fixed coils and a moving magnet, which enables it to stand substantial overloads. Coils can be in series, or connected differentially for either polarized or differential operation, and can be wound to match circuits up to 22,000 Ohms. Contacts are s.p.s.t. or s.p.d.t., with or without neutral positions, and handle $\frac{1}{4}$ ampere non-inductive load. This sensitive, light-weight relay is compact and sturdy...stands exposure and vibration.

Consult with EDISON Engineers

The services of Edison engineers are available to help you work out your particular problems. Your inquiry, including as much data as possible on the proposed use, will receive prompt attention. Thomas A. Edison, Incorporated, Instrument Division, 100 Lakeside Avenue, West Orange, New Jersey.

June, 1947 — MID-MONTH — ELECTRONICS BUYERS’ GUIDE
VIBRATION — It's hidden... in high costs

Control it with

LORD SHEAR TYPE Bonded Rubber MOUNTINGS

Right now—this minute—and in your plant... you're losing money. The cause... VIBRATION! You can't see it—it's hidden... but you can see vibration's costly results on your profit and loss statement... in high costs—directly attributable to industrial fatigue, lagging production, inferior accuracy, excessive scrap and shortened machine life.

Vibration can be controlled... and doing that you can raise your plant efficiency and morale, your product quality, and your profits. For immediate action, contact the nearest Lord Field Engineer or Lord direct. Let him analyze your product... in countless cases efficient application of Lord Vibration Mounts has surprisingly improved product performance. And ask him to check factory equipment... possibly a relatively simple solution can eliminate vibration, making your plant a better place to work—and a better working plant.

A quarter-century of scientific research and experience in the field of Vibration Control and Bonded Rubber Products backs up our recommendations. Put us to work on your problems... make Lord your Headquarters on Vibration Control.

LORD MANUFACTURING COMPANY ERIE, PA.

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San Francisco, Calif. . C. D. LaMoree
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Fibron Products
Seattle, Wash. 
Portland, Ore. C. & H. Supply Co.
CANADA: Hamilton, Ont., Irvington Varnish & Insulator Co. of Canada, Ltd.

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
It's the result of over 40 years of service to the electrical industry. Years in which Irvington quality was constantly improved and many new insulations offered. Years during which our slogan "Standard of the World" became a fact.

VARNISHED CAMBRIC and TAPE. Straight cut and seamless bias material with high dielectric and mechanical strength as well as oil, moisture, and corona resistance. Seamless bias has greater elongation for wrapping irregular surfaces and corners. Thicknesses: .005” to .015”.

VARNISHED SILK, NYLON, RAYON, CAMBRIC STYLE SIC. Extra thin, light weight insulations for small, compact equipment. Thicknesses: .002” to .008”.

VARNISHED PAPER. From the thinnest of condenser type papers, Irvington's range includes varnished bond, kraft, red rope, and asbestos. Other papers may be coated on special order. Thinnest Irvington Varnished Paper: .00075”.

IVI-BIND. Yellow varnished cambric with pressure sensitive adhesive backing for easy application.

VARNISHED FIBERGLAS. Meets the need for flexible insulation with high dielectric strength and high heat resistance. Fiberglas has excellent tensile strength, moisture, and acid resistance. Thicknesses: .008” to .030”.

SILICONE VARNISHED FIBERGLAS. The latest development in flexible insulations. Possesses outstanding resistance to heat and moisture. Can be used at operating temperatures up to 175 deg. C. Thicknesses: .004” to .012”.

IRV-O-SLOT INSULATION. Various types of thicknesses of varnished fabrics bonded to fish and rag papers create a mechanically strong, easily formed slot insulation. Standard thicknesses: .005” to .020”.

VARNISHED TUBINGS and SLEEVINGS. Cotton, rayon, and Fiberglas tubular braid coated with Irvington varnishes to meet the latest Varnished Tubing Association standards on dielectric strength, uniformity, heat resistance, aging, and flexibility. Sizes from No. 24 to 1” I.D.; six colors.

MARVEL VARNISHES. Baking, air drying, internal curing. Internal drying varnishes cure to an infusible, non-thermoplastic mass. They possess exceptional penetration, bonding strength, and insulating properties... resist acids, alkalis, moisture, transformer oil... contain no harmful solvents to attack enamel wire.

IRVINGTON VARNISHES. Synthetic and oleoresinous insulating varnishes; black and clear; internal drying, baking, and air drying types; finishing and sticking varnishes – a wide range to meet all requirements.

MARVEL OIL STOP. For oil-tight splices, stop joints, pot heads and terminals. Also used as a filling compound for enclosed coils.

FIBRON EXTRUDED PLASTIC TUBING. Flexible tubing possessing excellent electrical properties. IRV-O-LITE for general use. TRANSFLEX, transparent tubing, used for conduit; FIBRON #5375, for high temperature applications; HYFLEX and IVI-FLEX for low temperature applications; and POLYTHENE for high frequency insulation. Sizes No. 24 to 11/2” I.D.

FIBRON PLASTIC TAPE. Flexible and elastic, Fibron tape has good dielectric and tensile strength, plus resistance to moisture, oils, grease, acids, alkalis, and corrosive fumes. Available in clear and black; .008”, .012” and .020” thicknesses.

OTHER IRVINGTON INSULATING MATERIALS. Cable Cloth • Gutta Percha Backed Varnished Cambric • Oil Immersed and Low Loss Varnished Cambric Tape • Machinery Enamels • Varnished Canvas • Varnished and Plastic Wire Markers • Punchings • Transformer Leads.

For further information and samples of Irvington insulations, or cooperation on any insulating problem, communicate with your nearest listed Irvington representative or with Irvington Headquarters.

IRVINGTON
VARNISH & INSULATOR CO.
Irvington 11, New Jersey
The invisible part of any Blaw-Knox Radio Tower is the accumulated experience gained by this company in the installation of thousands of towers in many quarters of the globe. This experience counsels the use of better material instead of cheaper material, higher safety factors instead of lower, the best construction instead of "good enough" and, in a word, the best.

The Blaw-Knox Tower you buy contains this priceless element without extra cost to you. Let us discuss your requirements without obligation.

BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2077 Farmers Bank Building, Pittsburgh 22, Pa.

BLAW-KNOX ANTENNA TOWERS
Mechanically Efficient . . . Electrically Correct COMPONENTS for RADIO and ELECTRONICS

Amphenol is devoting full facilities to the development and manufacture of quality components for radio and electronic applications to meet a myriad of peacetime needs. Amphenol technical knowledge, acquired through many years of experience and research and strengthened by extraordinary war-time production, is reflected in many new and improved products with heightened standards of quality and performance.

AMPHENOL

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CHICAGO 50, ILLINOIS

COAXIAL CABLES AND CONNECTORS • INDUSTRIAL CONNECTORS, FITTINGS AND CONDUIT • ANTENNAS • RADIO COMPONENTS • PLASTICS FOR ELECTRONICS
LOOK TO Centralab

Here are Exclusive New CENTRALAB Developments

NEW Multi-Unit "Couplate" assures fast, precision wiring on interstage couplings. First commercial application of the "printed circuit", the Couplate is a complete interstage coupling circuit which combines into one compact unit the plate load resistor, the grid resistor, the plate by-pass capacitor and the coupling capacitor.

Each Couplate is an integral assembly of "Hi-Kap" capacitors and resistors closely bonded to a ceramic plate and mutually connected by metallic silver paths "printed" on the base plate.

Centralab’s newest control is designed for miniature receivers, amplifiers, and hearing aids. No bigger than a dime, high quality performance is assured. Its perfect companion for sub-miniature tubes, batteries, etc.

Specially designed for transmitters, power supply converters, X-ray equipment, etc., CRL medium-duty Power Switch gives efficient performance up to 20 megacycles. Minimum life operation of 25,000 cycles without failure.

For television units, "Hi-Vo-Kaps" offer high voltage, small size ... as filter and by-pass capacitors in video amplifiers for high DC voltages with small component AC voltages. Choice of three terminal types.

Revolutionary, new CRL Slide Switch saves space, allows short leads, convenient location to coils, reduced lead inductances for increased efficiency in low and high frequencies. Maximum reliability and long service life assured.

"Hi-Kaps" are rated at a guaranteed minimum capacity for applications where close tolerances are unnecessary. Lowest minimum capacity will be exceeded by a substantial amount in all units.

In addition, Centralab has just announced a sensational new quality line of miniature ceramic disc capacitors. "Hi-Kap" permanent Ceramic-X stability assures utmost reliability in small physical size and low mass weight.

Diameter (Max. O. D.) $\frac{\varnothing}{4}$
Thickness (Maximum) $\frac{\varnothing}{25}$
W. V. D. C. 450
Guaranteed Min. Capac. .005
Flash Test V. D. C. 900
Weight (Average) 1 gm. .035 oz

Other capacity values available. Inquire now!
SWITCHES . . . complete line featuring high quality, rugged construction for every type of electronic and industrial application.

1) "F" Index: for simple band change or radio-phono operations or general switching applications. V-spring. Life test - 5 positions - 10,000 cycles.

2) "G" Index: ideal for industrial applications. Coil spring replaceable without removing switch. Life test - 5 positions - 250,000 cycles.

3) "H" Index: (at right) primarily for band change and general tap switch applications. Spring and ball mechanism. Life test - 5 positions - 10,000 cycles.

4) Tone Switch: 3-4-6-8-9 or 10 clips available in tone switch group. All rated at 6 watts. Contact resistance less than 2.34 milliohms.

5) Lever Switch: features coil spring mechanism with index spring replaceable without removal of switch from chassis. Life test - 50,000 cycles.

6) Power Switch: designed for special industrial and electronic uses. Efficient performance up to 20 megacycles. Life test - 25,000 cycles.

CONTROLS . . . full line featuring dependable performance, long life, low noise level and wide range of possible variations.

1) "R" Radiohms: two types - wire wound rated at 3 watts, composition rated at 1 watt. Both types can be twinned. Available with AC line switch.

2) "E" Radiohms: Composition type. Rubbing contact. 6 different resistance tapers. Rated at 1/4 watt. Available with AC line switch.

3) "M" Radiohms: most versatile control of all. Composition type. Rated at 1/2 watt. Can be twinned, tripled-twinned with switch or with concentric shaft.

4) "R" Radiohms: no bigger than a dime, for miniature receivers, amplifiers. Rating 1/10 watt. Low noise level, shielded from dust, lint, etc.

5) Switch Covers: five types for "R" Radiohms, 4 types for "M" Radiohms, 1 type for "E" Radiohms. Rated at 3 amp. 125 volts, 1 amp. 250 volts.

6) Rheostats: for commercial use such as small motor speed controls, charging rate adjusters, etc. Two sizes available: 25 and 50 watt.

CAPACITORS . . . made with Centralab’s high dielectric constant Ceramic-X, combining economy, convenient size and extreme dependability.

1) TC Tubulars: stable, having no appreciable change with aging, humidity or temperature. 4 sizes, capacity from 860 to 1 mfd., rated at 500 WVDC.

2) BC Tubulars: for use where temperature compensation is unimportant. Four tube sizes. Capacity from 0.000010 to 0.01 mfd., 300 WVDC.

3) High Accuracy: for rigid frequency control applications. Capacity tolerance, ± 5%. Standard working voltage 300 volts DC.

4) High Voltage: Capacity tolerance ± 10%. Five sizes from 5000 to 15,000 WVDC. Flashover voltage from 10,000 to 30,000 VDC.

5) Disc: miniature disc capacitors combining utmost reliability with small physical size, low mass weight. Diameter 5/8". Thickness 5/32".

6) Trimmers: four basic types. Working voltages 500 DC. Flash test 1100 VDC. Power factor, less than 0.2% at 1 megacycle.

CERAMICS . . . engineered for special industrial and electrical applications requiring specific properties of hardness, coefficient of expansion, porosity.

1) Steatite: Uniform white, high dielectric strength, high mechanical strength, low dielectric loss at high frequencies. Impervious to moisture and common acids, does not warp in use, will withstand high temperature and its characteristics remain stable with age.

2) Centradite: For use where low thermal expansion and high resistance to heat shock is desired. Composed chiefly of Cordierite, a magnesium aluminum silicate crystalline material. White in color and low in porosity. Variations available for specific design and production needs.

3) Zirconite: Has low coefficient of expansion and good thermal shock properties plus high strength characteristics. Recommended for extruded or wet-pressed shapes. Variations of this material also available to meet specific design and production requirements.

CENTRALAB
Division of GLOBE-UNION INC. • Milwaukee, Wis.
ADC components have proved their efficiency and reliability by many years of uninterrupted trouble-free service. Careful engineering, precision workmanship, thorough inspection and laboratory testing guarantee long life for all ADC communication components.

ADC JACK PANELS are made of molded plastic, steel reinforced for strength and rigidity. Slotted brackets for mounting on standard 19" relay rack. Standard double plug spacing.

ADC PATCH CORDS have proven their ability to "take it" through years of usage. The plugs are well designed. Simple, rugged construction. Shielded cords made from the finest stranded, tinned copper, two-conductor wire.

ADC TRANSFORMERS. Two new transformer lines are now available. Quality-plus transformers and Industrial transformers. Quality-plus transformers provide the flattest response characteristics of any stock transformers available. Our catalog lines as well as custom-built transformers incorporate many hidden features that result in expected performance and long life, insuring satisfied customers.

Hermetically sealed transformers built to Army-Navy Specifications are being made regularly in quantities both large and small.

ADC JACKS are of welded box type construction assuring alignment of all parts. Silver alloy contacts riveted through non-ferrous springs. Standard dimensions.

WRITE FOR CATALOG No. 46

Audio Development Co.
2833 13th Ave. S., Minneapolis 7, Minn.
Manufacturers who are proud of their products install El-Menco Capacitors

Most manufacturers guarantee their products, and will make good on their guarantees when called upon. But makers of famous-name products try to anticipate every failure possibility, thus preserving their prestige and eliminating costly come-backs. When they choose capacitors, their choice is invariably El-Menco — known the world over for absolute reliability under all operating conditions.


Molded Mica Capacitors

Mica Trimmer

Foreign Radio and Electronic Manufacturers communicate direct with our Export Department at Willimantic, Conn. for information.

Write on firm letterhead for catalog and samples.
The NEW material for Electrical Bar Contacts

This new material consists of one or more strips of precious metal bonded to the base metal in the form of a ridge or bar.

This new method of lamination provides a great advantage to manufacturers of many contact assemblies, in that an arm or leaf can be blanked out with the contact already attached. The precious-metal ridge constitutes a bar-shaped contact.

By specifying the width and height of the precious-metal strip, any electrical current requirements can be met. Costly assembly operations are reduced to blanking costs. The precious metal that was wasted in the shank of a rivet can be saved.

We have standardized on a number of strip widths and thicknesses for both single, double and double-double combinations in "Raised-Lay." We are also prepared to furnish contact material in the form of "Inlay," "Edgelay," and "Overlay." In addition to supplying these materials, we offer a blanking service to your specifications.

Your inquiries are cordially invited.

*Patents applied for covering both the material and the method of manufacture.

D. E. MAKEPEACE COMPANY
Main Office and Plant, ATTLEBORO, MASSACHUSETTS
New York Office, 30 Church St. Chicago Office, 55 East Washington St.

LAMINATED PRECIOUS METALS
SHEET • WIRE • TUBING
FABRICATED PARTS AND ASSEMBLIES
BAR CONTACT MATERIAL
PRECIOUS METAL SOLDERS
Only ELECTRO-VOICE provides such a complete line of microphones. With outstanding developments in Unidirectional, Differential, Bi-directional, and Non-directional types... in Dynamic, Crystal, Carbon and Velocity models... you can more easily obtain the microphones best suited to your needs.

Proved in critical service, E-V Microphones are widely used today by leading manufacturers and sound engineers in all kinds of applications. They are produced from finest materials under E-V quality control. Consult our engineers.

**THE CARDYNE**—True cardioid unidirectional dynamic microphone, with exclusive E-V Mechanophase* principle, Acoustalloy diaphragm, smooth, wide range response, and high output.

**THE CARDAX**—The only high level cardioid crystal microphone with Dual Frequency response for high fidelity voice and music, or rising characteristic for extra crispness of speech.

* Patent No. 2,350,010  Electro-Voice Patents Pending

Send for Catalog No. 101
This illustrated catalog gives complete data and information on E-V Microphones. Includes helpful selection guide. Write for it today.

No finer choice than Electro-Voice

Electro-Voice, Inc., Buchanan, Michigan

Export Division: 13 East 40th Street, New York 16, N. Y., U.S.A. Cables: Arlab

Electronics Buyers' Guide — June, 1947 — Mid-Month
Collins Expands Its

In addition to its products for broadcasting, communication, and aircraft radio, the Collins Radio Company has enlarged its engineering staff and expanded production facilities to provide new additional types of equipment for industry and aviation. Included with newly developed products are mechanical and electrical control systems, an aircraft navigation system, and radioteletype communication equipment.

The list of Collins quality-built products now includes:

1. AM and FM broadcast transmitters in all power classifications.
2. Complete AM and FM studio equipment and accessories, and transmitter accessories.
3. Commercial airline and executive aircraft transmitters, receivers, and aircraft navigation components.
4. AM and FM multi-frequency communication transmitters, receivers, and systems covering a power range of 50 watts to 5,000 watts.
5. Amateur radio transmitters, excitors, and receivers.
6. Components and control systems typical of which are those described on these pages.

The Collins Autotune is an automatic repositioning mechanism for precise control of shafts having either rotary or linear movement. The Autotune can be used as a single unit or in groups, with each unit individually adjustable and with a single control for the entire system. Any combination of variable components can be returned to any one of a number of preadjusted positions in a very few seconds. Autotune units are available in a torque range of 1 to 25 inch-pounds. As a control device, the Autotune is currently utilized in many government and industrial applications.

The Type 496E, illustrated above, is especially suitable for application as an automatic tuning device for home radio receivers. It provides the consistently reliable push-button tuning essential for
Services To Industry

high quality all-wave AM-FM receivers. Reset accuracy is within one part in 36,000. The 496E is a low cost packaged unit complete with motor drive and control elements. Installation is simple, requiring only one direct connection. The output torque is one inch-pound. A 115 V. a-c power source is utilized.

The Autotune is adaptable readily to any application for which its power is sufficient. The control switch or push-button rack can be located at a remote point. The Autotune does not require special attention. Initial settings and desired changes can be performed by unskilled personnel. Accuracy is independent of normal wear and changes in operating conditions.

The Type 341A-1 Servo Mechanism is one of a series of packaged servo equipments that can be utilized to fulfill a wide range of service requirements, thus eliminating the cost in time and money of making special designs each time a new application problem is encountered. Each servo equipment includes an amplifier and a controlled motor drive unit. The drive motor is responsive to changes in the control signal of plus or minus 20 millivolts. Collins servo units can be supplied for operation from either a-c or d-c signals. These mechanisms have been applied to such diverse applications as remote tuning systems, automatic control of drilling operations in oil fields, and for automatic monitoring and centering of the localizer portion of aircraft instrument landing systems.

The 197A-1 D-C Amplifier unit consists of two separate amplifiers in one case. Each unit has a gain of approximately 40 db, and will amplify a small d-c potential to an output sufficient to drive a recording meter of the Esterline-Angus 5 ma type. Amplifier gain is adjustable in fixed steps; output is a linear function of the input. The input impedance of the 197A-1 is 10,000 ohms.

An example of the usefulness of this d-c amplifier

(Electronics Buyers' Guide — June, 1947 — Mid-Month)
is its function in the testing of aircraft radio navigation systems. A graphic record can be made of a plane's deviation from a desired flight course, taking the information from the terminals of a cross pointer indicator. The 197A-1 equipment is mounted in a dual unit arrangement, thus providing amplifiers for simultaneous glide path and localizer checking.

Collins d-c amplifiers can be built to operate from either d-c or a-c power sources.

* * *

The 340A-1 remote electric tuner is representative of Collins instruments designed and manufactured for a specific purpose but with wide application possibilities. This unit is used for remote tuning of a radio compass, on either a dual or single control basis. It is a servo equipment utilizing a control device, an amplifier, and an electric follower. The amplifier includes damping circuits for the prevention of hunting or overshooting.

* * *

The Collins Type 550A-1 Re Airborne Navigation System is indicative of the close coordination between the Collins development program and progress in aircraft navigation. This equipment includes the 51R navigation receiver, distance measuring equipment, and an automatic computer. Utilizing data obtained from the Omni Directional Range (ODR) and Distance Measuring Equipment (DME), the 550A-1 system enables the pilot to follow a cross pointer indicator and distance indicator to any desired destination.

* * *

The Collins Model 700 radioteletype equipment offers a new and improved method of transmitting and receiving typed messages by radio. The 700A converter unit will operate in conjunction with any receiver having an IF between 450 kc and 500 kc. This converter accommodates all frequency shift keying having a frequency differential of 250 cps to 1,000 cps.

The complete group includes transmitter, FSK unit, receiver, converter, and necessary accessories. Automatic frequency control is applied to the receiving equipment.

* * *

Special oscillators for frequency control purposes are available in several frequency ranges.
Developed originally for exacting military aviation requirements, these units are designed for accuracy and stability under the difficult and constantly changing operating conditions in a wide variety of uses, including Civil Aircraft Communications. Permeability tuning is employed, with its inherent advantages in stability and accuracy of calibration, and reductions in size and weight. Linear or special calibration can be furnished to fit any purpose. Complete tooling and facilities permit ready production of either large or small quantities.

These oscillators can be sealed as in most military applications, thus providing additional protection against changing service conditions. The Type 70E-1 is such a unit. It has a frequency range of 10-1.5 mc, linear tuning, and an overall accuracy of 0.04%.

A large section of the Collins engineering staff is available for consultation and advice with regard to any applications being considered for these and other instruments and component units. Engineering models for your particular application are made available quickly and at reasonable prices. We will welcome your inquiries on any problem concerning broadcast, communication, navigation, instrumentation, or controls. Write for further information.

IN RADIO COMMUNICATIONS, IT'S . . .

COLLINS RADIO COMPANY, Cedar Rapids, Iowa
11 West 42nd Street, New York 18, N. Y.
458 South Spring Street, Los Angeles 13, California
They have proved their value to American industry by their efficient handling of tough and unusual jobs.

If you have a knotty operating problem, Adlake engineers stand ready at all times to recommend—and if necessary, develop—the relay best suited to your needs. There's no obligation. Due to limited space on these two pages, we can show only a few typical Adlake Relays, but all have these advantages in common:

1. Mercury-to-mercury contact assures positive, trouble-free action; chattering, silent; impervious to burning, pitting or sticking.

2. Contacts are hermetically sealed in glass or metal cylinders—dust, dirt, moisture or oxidation can never interfere with operation.

3. Armored against outside vibration or impact; designed for either stationary or moving equipment.

4. Because they are hermetically sealed, Adlake Relays require no servicing, maintenance or periodic cleaning of contacts; they are dependable, efficient... always.

TYPE 1040 TIME DELAY RELAY
FOR A.C. ENERGIZATION

- Maximum time delay . . . up to 30 minutes
- Time delay limits . . . 10% unless otherwise specified
- Coil voltage . . . up to 440 v. A.C. (25-50 and 60 cy.)
- Coil—watts input . . . 3.5 to 8 watts (depending on frequency)
- Contact arrangement . . . single pole normally open or closed
- Available in . . . slow operate—quick release, slow operate—slow release, quick operate—slow release

Note: This relay may be used on higher coil voltages and D.C. when an external resistor is placed in series with the coil.

TYPE 1110 QUICK-ACTING RELAY
FOR A.C. ENERGIZATION

- Coil voltage . . . to 110 v. A.C. (25-50 and 60 cy.)
- Coil—watts input . . . 3.5 to 6 watts (depending on frequency)
- Contact arrangement . . . single pole normally open
- Contact rating . . . 15 amp. non-inductive at 110 v. A.C.

Note: This relay can be used on higher coil voltages and D.C. when an external resistor is placed in series with the coil.

TYPE 1200 TIME DELAY RELAY
FOR D.C. ENERGIZATION

- Maximum time delay . . . up to 30 minutes
- Time delay limits . . . 10% unless otherwise specified
- Coil voltage . . . to 130 v. D.C.
- Coil—watts input . . . 3.0 to 5.5 watts
- Contact arrangement . . . single pole normally open or normally closed

Note: This relay may be used on higher D.C. voltages if an external resistor is placed in series with the coil.

Contact Ratings

<table>
<thead>
<tr>
<th>TIME DELAY—</th>
<th>A.C.</th>
<th>D.C.</th>
<th>A.C.</th>
<th>D.C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Normally Open</td>
<td>110 VOLTS</td>
<td>220 VOLTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slow operate</td>
<td>15 amp</td>
<td>1.5 amp</td>
<td>5 amp</td>
<td>.5 amp</td>
</tr>
<tr>
<td>Quick release</td>
<td>10 amp</td>
<td>1 amp</td>
<td>3 amp</td>
<td>.3 amp</td>
</tr>
<tr>
<td>Slow operate</td>
<td>5 amp</td>
<td>.5 amp</td>
<td>1.5 amp</td>
<td>.15 amp</td>
</tr>
<tr>
<td>Slow release</td>
<td>2.5 amp</td>
<td>.15 amp</td>
<td>.6 amp</td>
<td>.1 amp</td>
</tr>
</tbody>
</table>

WHEN TIME DELAYS:

-.5 to 10 seconds
11 to 60 seconds
61 to 120 seconds
Over 120 seconds

Note: Greater tolerance is required for time delays above ten minutes.

Contact Ratings

<table>
<thead>
<tr>
<th>TIME DELAY—</th>
<th>A.C.</th>
<th>D.C.</th>
<th>A.C.</th>
<th>D.C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Normally Closed</td>
<td>110 VOLTS</td>
<td>220 VOLTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slow operate</td>
<td>5 amp</td>
<td>.5 amp</td>
<td>1.5 amp</td>
<td>.15 amp</td>
</tr>
<tr>
<td>Quick release</td>
<td>2.5 amp</td>
<td>.15 amp</td>
<td>.8 amp</td>
<td>.1 amp</td>
</tr>
<tr>
<td>Slow operate</td>
<td>10 amp</td>
<td>1 amp</td>
<td>3 amp</td>
<td>.1 amp</td>
</tr>
</tbody>
</table>

WHEN TIME DELAYS:

-.5 to 10 seconds
11 to 60 seconds
61 to 120 seconds
Over 120 seconds
**DIMENSIONAL DIAGRAMS**

PROJECTION 2 9/16”
No. 1040 normally open relay

PROJECTION 2 9/16”
No. 1040 normally closed relay

PROJECTION 2 1/16”
No. 1110 normally open load relay

PROJECTION 2 1/2”
No. 1200 relay normally open or normally closed

**OPTIONAL TERMINAL BOARD ARRANGEMENTS**

Type No. 1040 Normally open time delay or quick-acting relay with front panel mounting.

Type No. 1040 Normally open time delay or quick-acting relay with back panel mounting.

Type No. 1040 Normally closed time delay or quick-acting relay with front panel mounting.

Type No. 1040 Normally closed time delay or quick-acting relay with back panel mounting.

Type No. 1040 Double unit normally open relay assembly. Time delay and load relay—two-time delays or two-load relays. Normally closed construction not shown but is available.

Type No. 1200 Double unit normally open or normally closed relay assembly. Time delay or load relay combinations, or two-load relays, or time delay relays.

**THE ADAMS & WESTLAKE COMPANY**

ESTABLISHED IN 1857
ELKHART, INDIANA
NEW YORK - CHICAGO

MANUFACTURERS OF ADLAKE HERMETICALLY SEALED MERCURY RELAYS FOR TIMING, LOAD AND CONTROL CIRCUITS

ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH
ELECTRONIC TUBING—
"TAILORED TO YOUR NEEDS"

The Electronics Division of Superior supplies manufacturers of all types of electron tubes with cathodes, anode and grid cylinders, and any other tubular parts that are used inside the envelope of such tubes. In addition, random length tubing is produced for fabrication by the user. To insure that these critical items are handled in a way that will make them most satisfactory for the user, a modern and well equipped laboratory is constantly working on research and production problems.

Some of the electron tubes using the above types of metal tubing are the following:

- Radio receiving and transmitting tubes
- Television picture and pick-up tubes
- Photo tubes
- Gaseous discharge and control tubes
- Industrial electronic tubes, such as thyratrons
- Rectifier tubes
- Neon tubes
- Radar tubes
- Special purpose tubes, such as voltage regulators

Products for Electronic Industry

The picture on the left demonstrates very well that Superior is equipped to supply tubes flanged, flared, one or both ends rolled, angle cut or straight cut, one end expanded, as well as bent and flattened tubes, etc.

NICKEL CATHODES

SEAMLESS—Standard production calls for an O.D. range of .010" to .120", inclusive, with wall thicknesses from .0015" to .003", inclusive. (Most generally used wall specification is .002/.0025"). Cathodes with larger diameters and heavier walls can, of course, be produced and full information will be given upon inquiry. The International Nickel Company's #220 grade of seamless nickel is the most widely used material. These cathodes can be cut to almost any length required, with bead (emboss), if called for, located at practically any position on the cathode, .040" minimum. Available in round, oval, elliptical, or rectangular shape. Close tolerances are maintained—for detailed information write for Specification EM-2.

LOCKSEAM†—These cathodes are produced from nickel strip especially rolled for the purpose. The standard range of sizes is .040" to .100" O.D., inclusive, with wall thicknesses of .002" ± .0001" and .0025" ± .0001", and lengths from 11.5 mm. to 42 mm., inclusive. Various analyses of nickel strip are used, depending on the tube characteristics required. For further details on the analyses of cathode materials write for Data Memorandum #5. Beads can be located at practically any position on the cathodes, .040" minimum. Available in round or oval shape.

VERTICALLY EMBOSSED LOCKSEAM† CATHODE SLEEVES—a significant new development. Write for complete data.

FINE SMALL TUBING IN MANY METALS
METAL TUBING FOR ELECTRON TUBES OF ALL TYPES

ANODE GRID CYLINDERS AND OTHER TUBULAR PARTS FOR CATHODE RAY AND TELEVISION TUBE GUN STRUCTURES

The standard specification is \(0.500'' \pm 0.0015'' - 0.005''\) I.D. \( \times 0.010'' \pm 0.001''\) or \(0.015'' \pm 0.0015''\) wall, in lengths according to your requirements, with a tolerance of \(\pm 0.005''\). Most widely used material is WELDRAWN (welded and drawn) 18-12 Stainless. Nickel, Monel and Inconel are sometimes used for these applications.

THE DISC CATHODE

THE DISC CATHODE, another outstanding Superior development, consists of a nickel tubular shank, a ceramic insulator, and an emitting cap welded to the shank. Through the use of integral beads (embosses) on the tubing, the insulator is firmly held, yet with much less heat loss than with other designs.

ELECTRONIC TYPE TUBING IN RANDOM LENGTHS

Superior furnishes lengths of tubing (random or cut) in many Carbon Steel, Alloy Steel, Stainless Steel, and Glass Sealing Alloy analyses for various applications in the electronic industry. Write for Data Memorandum #1.

You can be certain that your requirements in Electronic tubing, whether for standard applications or developmental specialties, will be accurately produced under the rigid inspection and positive manufacturing control of Superior's Electronics Division — your inquiry will receive prompt attention.

Superior

SUPERIOR TUBE COMPANY
ELECTRONICS DIVISION
2504 Germantown Avenue
Norristown, Pa.
FASTER - BETTER SOLDERING!

SEVEN TIP STYLES

A scientifically engineered thermostat built into each Kwikheat Iron automatically maintains the proper temperature for maximum soldering efficiency. Not only that, but each Kwikheat Iron gets hot... ready for use... within 90 seconds after plugging in. Seven different tip styles adapt the iron to almost any job... the handle design protects the hand from contact with hot metal parts. Not since 1883, when soldering irons were first electrified, have there been so many improvements in one soldering tool.

See Kwikheat Demonstrated

HOT IN 90 SECONDS

KWIKHEAT
THERMOSTATIC SOLDERING IRON
Sound Equipment Corp. of Calif., 3903 San Fernando Rd., Glendale 4, Calif.

Linde Introduces the Bulb with the Quick-Release Seal

The narrow stem is easily fused to the manifold.

Match-flame quickly breaks the seal to release gas.

- No premature loss of gas.
- No magnets.
- No removal of bulb to break seal.

Helium
Neon
Argon
Krypton
Xenon
Mixtures

THE LINDE AIR PRODUCTS COMPANY
Unit of Union Carbide and Carbon Corporation
30 East 42nd St., New York 17, N.Y.

In Canada:
Dominion Oxygen Company, Limited, Toronto

DKE CAPS AND BASES

...for precision application!

Dependable DKE electronic tube components are used extensively by many of the leading manufacturers. A wide variety of standard designs are available, with exceptional economies resulting from complete DKE tooling facilities. Special bases, caps and clips can be produced to existing specifications on short notice with low unit cost.

THE ENGINEERING CO.
DANIEL KONSKJIAN
27 WRIGHT ST., NEWARK, N. J.

Electronic Engineering Company, Inc.
3223 West Armitage Avenue
Chicago 47, Ill.
A NEW ECONOMICAL RESISTOR LINE

PERMANENT LOW UNIT COST

CLOSE TOLERANCE LIMITS

PROMPT DELIVERY

QUALITY

IN-RES.CO

TYPE ALA — 3 WATTS
MAX RES: 25,000 Ohms (Nichrome)
MAX RES: 5,000 Ohms (Manganin)
BODY SIZE: 1/8" Lg. by 3/8" Dia.
MOUNTING: By Axial Leads
TERMINALS: No. 18 Tinned Copper Leads, 2 inches long
TOLERANCES: Standard 3% (1% at Slight Extra Cost)

Type ALA can be supplied with non-inductive winding with 50% reduction in maximum resistance. Add suffix "N" to code when specifying non-inductive types (ALAN, ACAN, BLAN, BCAN).

TYPE ACA — 6 WATTS
Same as Type ALA except coated with high temperature cement.

TYPE BLA — 5 WATTS
MAX RES: 50,000 Ohms (Nichrome)
MAX RES: 10,000 Ohms (Manganin)
BODY SIZE: 3/4" Lg. by 3/8" Dia.
MOUNTING: By Axial Leads
TERMINALS: No. 18 Tinned Copper Leads, 2 inches long
TOLERANCES: Standard 3% (1% at Slight Extra Cost)

TYPE BCA — 10 WATTS
Same as Type BLA except coated with high temperature cement.

Types ALA, ACA, BLA, BCA can be supplied with non-inductive winding with 50% reduction in maximum resistance. Add suffix "N" to code when specifying non-inductive types (ALAN, ACAN, BLAN, BCAN).

This new line of resistors—designed to meet current demands for small, low-cost, quality units of close tolerance—is immediately available. They cover the full range from 1 watt to 10 watts and 1 ohm to 1 megohm. Designed for long life and stability, these components have hard soldered connections between resistance wire and terminals, assuring permanent noiseless, trouble-free units. These new resistors are engineered for the manufacturer who desires to retain a reputation of top quality and performance in his equipment. Like all IN-RES-CO products they are produced under rigid control by modern facilities. Write for details.

INSTRUMENT RESISTORS CO.
1036 COMMERCE AVENUE, UNION, NEW JERSEY
SELENIUM RECTIFIERS...Built on Aluminum

LARGE OR SMALL WE BUILD THEM ALL

<table>
<thead>
<tr>
<th>CODE NO.</th>
<th>CIRCUIT</th>
<th>MAX. R.M.S. INPUT VOLTS</th>
<th>OUTPUT VOLTS</th>
<th>OUTPUT AMPS.</th>
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<tbody>
<tr>
<td>A1C1S1B</td>
<td>1 Phase Center Tap</td>
<td>24</td>
<td>8</td>
<td>.220</td>
</tr>
<tr>
<td>B2B1S1B</td>
<td>1 Phase Bridge</td>
<td>48</td>
<td>36</td>
<td>.30</td>
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<tr>
<td>C581S1B</td>
<td>1 Phase Bridge</td>
<td>12</td>
<td>90</td>
<td>.6</td>
</tr>
<tr>
<td>D1C1S1B</td>
<td>1 Phase Center Tap</td>
<td>24</td>
<td>8</td>
<td>1.6</td>
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<tr>
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<td>48</td>
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<td>2.4</td>
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<tr>
<td>F7B1S1B</td>
<td>1 Phase Bridge</td>
<td>168</td>
<td>120</td>
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<td>35</td>
<td>6.0</td>
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<tr>
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<td>1 Phase Bridge</td>
<td>24</td>
<td>17</td>
<td>10.0</td>
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<tr>
<td>FH1C3S1B</td>
<td>1 Phase Center Tap, Fan Cooled</td>
<td>24</td>
<td>6</td>
<td>60.0</td>
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<tr>
<td>FH1H4S1B</td>
<td>3 Phase Half Wave, Fan Cooled</td>
<td>13.8</td>
<td>9</td>
<td>250.0</td>
</tr>
</tbody>
</table>

The above ratings for 35°C ambient continuous duty resistive inductive load.

Other combinations manufactured to meet your requirements.

For AC-DC conversion where minimum maintenance costs and maximum efficiency are required, circuit designers write SELETRON into their specifications...right at the start!

These advanced type selenium rectifiers built on aluminum are engineered for long life, minimum weight, compactness and maximum heat dissipation. Ten standard sizes of discs provide outputs ranging from 50 milliamps to thousands of amperes. Arrangement of discs in infinite series and parallel combinations makes possible stacks to meet specific requirements for voltage and current.

Consultation with our engineers on any problem is invited. Their services and advice are yours without any obligation. Write TODAY for our informative bulletin on SELETRON Selenium Rectifiers and for the SELETRON application data sheet.

Address Dept. 5-36.

FOR RADIO APPLICATIONS...

Specify SELETRON
Miniature Selenium Rectifiers

- STARTS INSTANTLY
- RUNS COOL
- WILL NOT BREAK
- BOOSTS PERFORMANCE
- LASTS LIFE OF SET
- EASILY INSTALLED

<table>
<thead>
<tr>
<th>S1L</th>
<th>75 mil 5-plate stack 3/8&quot;x3/8&quot;x3/8&quot;</th>
<th>150 mil 5-plate stock 1/4&quot;x1/4&quot;x3/8&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP1</td>
<td>75 mil 5-plate stack 1/4&quot;x1/4&quot;x3/8&quot;</td>
<td>100 mil 5-plate stack 1/2&quot;x1/2&quot;x3/8&quot;</td>
</tr>
<tr>
<td>S51</td>
<td>75 mil 5-plate stack 3/4&quot;x3/4&quot;x3/4&quot;</td>
<td>100 mil 5-plate stack 1 1/2&quot;x1 1/2&quot;x3/8&quot;</td>
</tr>
</tbody>
</table>

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
The Key to Better Small Gears

Open the way toward getting UNIFORMITY in the Small Gears you buy! G.S. precision methods and machinery offer you the key to all that is newest and best in Fractional Horsepower Gear manufacture. Here, you’ll get the friendly cooperation of experts—men who have devoted a lifetime to the design and quantity production of Small Gears exclusively. Here, too, is every device known to modern science for producing gear after gear—whether it’s one hundred or one hundred thousand—to a degree of uniform accuracy heretofore considered impossible! If a Fractional Horsepower Gear is involved, by all means discuss its design and its function with a G.S. engineer. Get valuable information and cost estimates without cost or obligation. Discover for yourself why “G.S.” has become the “WORLD’S LARGEST EXCLUSIVE MANUFACTURERS OF FRACTIONAL HORSEPOWER GEARS”!

SEND FOR...
the G.S. 4-page Bulletin which illustrates and describes many different types and applications of G.S. Small Gears. Will you ask for a copy on company stationery, please?

Gear Specialties
Spurs • Spirals • Helicals • Bevels • Internals • Worm Gearing • Racks • Thread Grinding

2635 West Medill Avenue • Chicago 47, Illinois

WORLD’S LARGEST EXCLUSIVE MANUFACTURERS OF FRACTIONAL HORSEPOWER GEARS

Electronics Buyers’ Guide — June, 1947 — Mid-Month
BALLANTINE ELECTRONIC VOLTMETERS

The INDICATING METER used on all BALLANTINE VOLTMETERS features a single logarithmic voltage scale and uniform decibel scale. Makes readings especially easy. Accuracy of indication is 2% at any point on the scale.

MODEL 300 ELECTRONIC VOLTMETER. For the precise measurement of AC voltages from 1 millivolt to 100 volts over a frequency range of 10 cycles to 150,000 cycles. Accuracy of voltage readings is within 2%. Output jack and output control provided so that instrument can be used as highly stable amplifier, with 70 DB gain, flat within 2% over entire frequency range. Input impedance is 1/2 megohm. Special circuits insure permanent and highly accurate calibration, not affected by variation in line voltage or tube replacement. A high quality instrument for laboratory use — note the several accessories listed below which further increase utility of voltmeter.

MODEL 304 R.F. VOLTMETER. This instrument measures AC voltages over a range of 1 millivolt to 100 volts from 30 cycles to 5.5 megacycles. Probe type input connector attached by a flexible cable provides true indication of voltages at point of origin in circuits. Accuracy of voltmeter readings are within 5%. Input impedance is 1 megohm shunted by 9 mfd's. Can be used as wide-band amplifier. Especially useful for reading millivolts in television and FM intermediate frequency amplifier circuits, RF heating apparatus, carrier current systems and in particular for extending useful frequency range of ordinary oscilloscopes to beyond 5 megacycles.

MODEL 302 ELECTRONIC VOLTMETER. This Sensitive Electronic Voltmeter is portable and operates from lightweight batteries contained within carrying case. Reads AC voltages from 1 millivolt to 100 volts over frequency range of 5 cycles to 150,000 cycles. Accuracy 2% at any point on scale. Can be used as highly stable amplifier. Input impedance 1/2 megohm. Uses standard Eveready or Burgess batteries. Battery life over 150 hours.

MODEL 220 DECADE AMPLIFIER. An accessory designed for use with Model 300 and Model 302 Voltmeters to permit the measurement of AC voltages below one millivolt. A highly stable amplifier giving accurately standardized gains of 10x and 100x over a frequency range of 10 to 100,000 cycles. Operates from batteries contained within case. When used with Ballantine Voltmeters, AC voltages down to 0.00001 volt (10 microvolts) can be measured. Calibrated gain is independent of battery voltage, circuit constants and tubes, within 2%.

TECHNICAL BULLETIN IS AVAILABLE COMPLETELY DESCRIBING ABOVE INSTRUMENTS

BALLANTINE LABORATORIES, INC.
BOONTON, NEW JERSEY, U. S. A.

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
These Littelfuse 3AG fuse mountings offer sharply increased safety and convenience. Typical of the complete Littelfuse line of fuses, mountings and accessories, they represent smooth coordination of sound engineering and original thinking. This assures effective circuit protection and lasting satisfaction.

Littelfuse 3AG Extractor Posts eliminate unsightly exterior fuse clips on appliances, equipment or instruments. The fuse is held in the end of the removable knob. Unscrew it, and the fuse is safely changed without irritating inconvenience. Their dead front construction prevents accidental electrical shocks. Extractor Posts are easy to install. They conserve space in panel layouts—can be ganged in rows with a common bus.

Littelfuse 3AG Extractor Posts are available in finger-operated types with and without 3½” flexible cord or “keep chain,” and in a screwdriver type.

Steel-covered 3AG size fuse mountings prevent accidental damage to fuses, prevent injury by exposed terminals. Available with convenient hinged cover in single and double pole types, and in single pole and spare fuse holder combinations, these mountings all have fatigue-resistant nickel plated phosphor bronze clips. A double-pole type with removable non-hinged cover also is offered.

Both types meet Underwriters’ requirements, and solve your fuse-mounting problems with thrift and efficiency. Send for your new Littelfuse catalog number 9 today!
Millen "Designed for Application" components are different! As a designer and manufacturer for many years of complex electronic and communication equipment, we are our own best customer for component parts. Consequently, we have to perform an outstanding job of designing and manufacturing such parts in order to satisfy our own applications. Our parts are "different", also, because as symbolized by the "Gear wheel" of our registered trade mark, they are designed by mechanical engineers working in close cooperation with our electronic circuit group. Below are illustrated a typical half dozen of the thousand-odd items we manufacture.

Illustrated above, left to right; Top row: The No. 80075 cathode ray tube Bezel, the No. 04000 series of adjustable shaft angle, center drive variable transmitting condensers and the No. 74001 permeability tuned shielded plug-in coil form. Bottom row: The No. 36011 snap lock multiple finger contact plate caps, the small panel dials and finally the Ceramic insulated plate caps.
Westinghouse offers you the right combination in electronic tubes:

1. **A complete line.** Westinghouse provides Quality Controlled tubes for industrial and communications applications.

2. **The Easy Guide.** This newly revised edition gives you a simple, quick way of selecting the proper Westinghouse tube for your purpose. It gives essential technical data on each tube and includes an interchangeability chart for selecting the appropriate Westinghouse tube for various competitive designations.

3. **Replacement tube service.** Westinghouse gives you prompt and efficient service through its district warehouses and distributors throughout the country. "One call does it all."

If you do not have your copy of the Easy Guide, send for one today. Electronic Tube Sales Dept., Westinghouse Electric Corp., Bloomfield, N. J.

**DISTRICT SALES OFFICES**

<table>
<thead>
<tr>
<th>Location</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATLANTA 2, GA</td>
<td>1299 Northside Drive, N. W.</td>
</tr>
<tr>
<td>BOSTON 10, MASS.</td>
<td>10 High Street</td>
</tr>
<tr>
<td>CHICAGO 6, ILL.</td>
<td>20 North Wacker Drive</td>
</tr>
<tr>
<td>NEW YORK 5, N. Y.</td>
<td>40 Wall Street</td>
</tr>
<tr>
<td>PHILADELPHIA 4, PA</td>
<td>3001 Walnut Street</td>
</tr>
<tr>
<td>PITTSBURGH 30, PA</td>
<td>Union Bank Building</td>
</tr>
<tr>
<td>SAN FRANCISCO 4, CALIF</td>
<td>1 Montgomery Street</td>
</tr>
<tr>
<td>ST. LOUIS 1, MO.</td>
<td>411 North 7th Street</td>
</tr>
</tbody>
</table>

Sales information and tubes also available from Westinghouse Electronic Tube Distributors throughout the country.
For precise, positive linkage between instrumentation and control

**INDUCTION GENERATOR:** when fed from AC source produces voltage proportional to speed of rotation. Used in circuits as velocity control component.

**PERMANENT MAGNET GENERATOR:** designed as AC potential source. Produces sinusoidal wave form with harmonic content under 2%.

**MOTOR DRIVEN INDUCTION GENERATOR:** powered by 2-phase, low-inertia induction motor. Used as fast reversing servo motor where maximum stall torques of less than 7 oz. in. are required.

**TELETORQUE UNIT — below left:** a precision-built, non-motorizing, self-synchronous unit for remote indication. Accurate to ±1 degree.

**CIRCUITROL UNIT:** useful as a resolver, phase shifter, rotatable and control transformer or phase indicator.

**INDUCTION MOTOR:** low inertia, two-phase squirrel cage unit for use as precision servo motor.

KOLLSSMAN OFFERS A LINE OF SPECIAL PURPOSE AC UNITS

To meet the varying needs of the electronics engineer in linking instrumentation up to control, Kollsman offers a group of units with sufficiently varied functions to solve a wide range of control problems. In nearly every case, units are available for operation at various voltages and frequencies to fit widely diversified electronic control and remote indication applications. These Kollsman units are the outgrowth of long development in aircraft instrumentation and control and — more recently — Kollsman's considerable work in this field for naval and military applications. They are light in weight, compact, and highly precise, so that engineers working with exact quantities will find them reliable to a high degree. Complete data on any or all of these units may be had upon request. Kollsman Instrument Division, Square D Company, 80-08 45th Avenue, Elmhurst, N. Y.
ERIE RESISTOR

Symbol of Quality

Temperature Compensating Molded Insulated Ceramicons
0.5 MMF—550 MMF
Temperature Compensating Dipped Insulated Ceramicons
0.5 MMF—13,000 MMF
Temperature Compensating Non-Insulated Ceramicons
0.5 MMF—1,770 MMF

Types 504B, 1/2 Watt—518B, 1 Watt Resistors
10 ohms—22 megohms

Erie “GP” Molded Insulated Ceramicons
10 MMF—5,000 MMF
Erie “GP” Dipped Insulated Ceramicons
0.5 MMF—13,000 MMF
Erie “GP” Non-Insulated Ceramicons
10 MMF—10,000 MMF

Custom Injection Molded Plastic Knobs, Dials, Bezels, Name Plates, Coilforms, etc.

Button Mica Condensers
15 MMF—6,000 MMF

Types 554, 554B, 1/2 Watt—518B, 1 Watt Resistors
10 ohms—22 megohms

Feed-Thru Ceramicons
3 MMF—1,000 MMF
3 MMF—1,500 MMF

Types L-4, L-7, 5-S Suppressors for Spark Plugs and Distributors

High Voltage Double Cup and plate Condensers
10,000 VOLS WORKING

Cinch-Erie Plexicon Tube Sockets with 1,000 MMF built in by-pass condensers

ERIE RESISTOR has developed and manufactured a complete line of Ceramic Condensers for receiver and transmitter applications; Silver-Mica and Foil-Mica Button Condensers; Carbon Resistors and Suppressors; Custom Injection Molded Plastic Knobs, Dials, Bezels, Nameplates and Coil Forms. Complete technical information will be sent on request.
skilled springmakers... AND practical, experienced engineers, SPECIALISTS in spring design and manufacture

At Accurate

It takes people to make springs. Ours are specialized, highly trained, long-experienced people—well qualified to give you the finest in spring craftsmanship.

Our engineers too, are an important reason why you'll like Accurate Spring Service. They're old hands at spring-making... they've developed manufacturing systems and procedures that enable us to handle your jobs with the greatest speed and efficiency. These Accurate engineers are at your service on spring design problems. You will benefit from their practical assistance in designing exactly the right spring for your application.

Why not try Accurate on your next job.

ACCURATE SPRING MFG. CO.
3830 W. Lake Street Chicago 24, Illinois

Send for your copy of the new Accurate Spring Handbook. It's full of data and formulae which you will find useful. No obligation of course.
As early as 1930 the Sperry Gyroscope Company put electronics to work — first by introducing electronic control for the Sperry Gyro-Compass. From then on electronics was employed whenever it could extend the usefulness and performance of Sperry products. Sperry’s versatility in this field can be seen from the following products where electronics is practically applied in the marine, aviation and industrial fields.

**MICROLINE TEST EQUIPMENT:** The accurate, dependable standards used to measure the performance of microwave components and systems. Virtually every type of instrument essential to precision microwave measurements is represented in this group of test equipment, covering every microwave frequency band.

**KLYSTRONS:** A complete line of Sperry Klystrons covering a range of 250-10,300 megacycles. These Klystrons include Reflex Oscillators, Oscillator-Amplifiers, Oscillator Buffers, Cascade Amplifiers and Frequency Multipliers. New Klystrons are introduced from time to time operating in other sectors of the frequency spectrum with higher powers and new design features.

**MICROWAVE RADIO EQUIPMENT:** (1) Broad Band Relay Systems (2) FM Studio to Transmitter Links (3) Satellite Control Channels (4) Control Circuits (5) Remote Television Pick-up.

**TRANSFORMERS AND SMALL MOTORS:** Designed and manufactured for special applications.

**STROBODYNE:** A dynamic balancing instrument for laboratory or factory use that detects and permits correction of unbalance vibrations causing displacements as small as two-tenths of one-millionth of an inch.
Aeronautical

A-12 GYROPILOT: The most modern and versatile of all automatic pilots, it provides (1) smooth, precise control (2) automatic coordination of rate-of-turn with bank angle for all air speeds (3) Gyrosyn Compass directional control (4) automatic control of altitude (5) automatic control of elevator trim (6) safety interlocks to prevent faulty operation (7) automatic approach control and automatic throttle control as standard accessories.

AUTOMATIC APPROACH CONTROL: A standard accessory of the A-12 Gyropilot — can be used with either the SCS-51 Instrument Landing System or the Sperry Microwave Landing System. Automatic Approach Control makes “let-down” and approach techniques almost entirely automatic. It streamlines cockpit procedure and reduces cockpit tension to a minimum.

MICROWAVE INSTRUMENT LANDING SYSTEM: A complete microwave instrument landing system, with beams propagated by the Klystron tube. It produces a flight path that is clear, sharp and precise all the way to the ground.

Sperry Gyroscope Company, Inc.
GREAT NECK, NEW YORK
DIVISION OF THE SPERRY CORPORATION

Marine

RADAR: Fulfills the three principal purposes of marine radar — as an aid in piloting, as a position indicator and as an anti-collision aid. Among its principal features are: Direct-reading range indication — High degree of range and bearing resolution — Center expand control — Choice of image presentation — Anti-clutter control — Twelve-inch diameter viewing scope — Remote indicators.

LORAN: Enables the navigator to obtain a vessel’s position accurately in from two to six minutes at any time, day or night, in any weather. Direct-reading Time-Difference Meter makes operation simple and prevents errors.

GYRO-COMpasses: Standard Mark 14 for large vessels — Mark 18 for vessels where space and weight are of primary importance. Both types operate automatic steering equipment, course recorders and repeater compasses.

GYRO-MAGNETIC COMPASS: A compass system that combines a magnetic compass and a gyroscope to provide accurate and steady indications of direction for intermediate size craft. The repeaters operated from this system are self-synchronous, so that no hand setting is necessary.

GYRO-MAGNETIC PILOT: Operates from the Gyro-Magnetic Compass and provides accurate, dependable automatic steering. A convenient, hand-held remote controller can be used with this equipment.
When manufacturers of electronic, radio and electrical apparatus, situated as far as 2000 miles and more from our plant, insist on Karp sheet metal craftsmanship, there must be good and profitable reasons.

One important reason is that Karp-constructed cabinets, enclosures, housings and chassis are custom-built to individual requirements; so precisely and uniformly made that time and money are saved on your assembly line. Another reason is that Karp builds good looks and streamlined styling into the product, giving you added sales and profit advantages.

Remember the Karp blueprint man symbolizes blue ribbon quality in cabinets, housings, enclosures and chassis. Tell us your needs. Get our quotations.

- Any metal
- Any gauge
- Any size
- Any quantity
- Any finish

KARP METAL PRODUCTS CO., INC.
116 - 30th STREET, BROOKLYN 32, NEW YORK

Custom Craftsmen in Sheet Metal
This Handbook gives 40 pages of dimensions, housings, terminal structures, mounting provisions, and electrical ratings, as well as performance characteristics of capacitors for diversified applications in the production of electrical apparatus. The Filterette section offers detailed data and specific recommendations for selection of approved units to quell radio noise from more than 80 common electrical devices which create troublesome interference. The new TOBE Catalog represents a real effort to satisfy the current needs of electronics engineers with a lucid, concise collection of data on capacitors.
A Wide Range of Winding Machines for a Wide Range of Coils

**“LATTICE-TYPE” COILS**

- "Universal", lateral-wound

**No. 84 Winding Machine**

<table>
<thead>
<tr>
<th>Model</th>
<th>Wire Range</th>
<th>Max. Dia.</th>
<th>Traverse</th>
<th>RPM</th>
<th>No. Coils at Once</th>
<th>HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>#19-42</td>
<td>5&quot;</td>
<td>1/32&quot;-1-1/2&quot;</td>
<td>400-650</td>
<td>1, 2, 3 or 4</td>
<td>1/4</td>
</tr>
</tbody>
</table>

"Gainer mechanism" and calibrated "strap-type" tensions insure accurate, uniform winding, also quick change-over. Simple design, rugged construction assure long life.

**Nos. 96 and 103 Winding Machines**

<table>
<thead>
<tr>
<th>Model</th>
<th>Wire Range</th>
<th>Max. Dia.</th>
<th>Traverse</th>
<th>RPM</th>
<th>No. Coils at Once</th>
<th>HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>96</td>
<td>#19 to 42, 46</td>
<td>6&quot;</td>
<td>1/16&quot;-3-1/2&quot;</td>
<td>500-1500</td>
<td>1 or 2</td>
<td>1/4</td>
</tr>
<tr>
<td>103</td>
<td>#18-38, 46</td>
<td>7&quot;</td>
<td>1/8&quot;-8&quot;</td>
<td>200-1200</td>
<td>1 or 2</td>
<td>1/2</td>
</tr>
</tbody>
</table>


**GUTTER-WOUND COILS**

- for Heavy Duty

**No. 98 Winding Machine**

<table>
<thead>
<tr>
<th>Model</th>
<th>Wire Range</th>
<th>Max. Dia.</th>
<th>Traverse</th>
<th>RPM</th>
<th>No. Coils at Once</th>
<th>HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>98</td>
<td>#8-20, 30</td>
<td>16½&quot;</td>
<td>1/4&quot;-12&quot;</td>
<td>35-135</td>
<td>1 or 2</td>
<td>1/4</td>
</tr>
</tbody>
</table>

Automatic guiding. Wire turns placed in grooves formed by preceding layers — for maximum density. Automatic stop at end of coil or end of each layer, as required.

**SPOOL-WOUND COILS**

- No insulation between layers

**No. 102 Winding Machine**

<table>
<thead>
<tr>
<th>Model</th>
<th>Wire Range</th>
<th>Max. Dia.</th>
<th>Traverse</th>
<th>RPM</th>
<th>No. Coils at Once</th>
<th>HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>102</td>
<td>#19-46</td>
<td>3½&quot;</td>
<td>1/16&quot;-3&quot;</td>
<td>500-2500</td>
<td>1, 2, 3, 6 heads</td>
<td>1/4</td>
</tr>
</tbody>
</table>

1, 2, 3, or 6 individually operated winding heads. Output is synchronized on basis of handling time per coil. Wire-layer length quickly adjusted. Automatic stop.

**PAPER-INSULATED COILS**

- Round and Rectangular

**Nos. 104 and 105 Winding Machines**

<table>
<thead>
<tr>
<th>Model</th>
<th>Wire Range</th>
<th>Max. Dia.</th>
<th>Traverse</th>
<th>RPM</th>
<th>No. Coils at Once</th>
<th>HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>104</td>
<td>#19-40</td>
<td>4½&quot;</td>
<td>1/16&quot;-5&quot;</td>
<td>500-2500</td>
<td>3 to 14</td>
<td>1/2</td>
</tr>
<tr>
<td>105</td>
<td>#19-40</td>
<td>4½&quot;</td>
<td>1/16&quot;-5&quot;</td>
<td>500-2500</td>
<td>10-28</td>
<td>1</td>
</tr>
</tbody>
</table>


---

For winding coils in quantity accurately... automatically use Universal Winding Machines.
MYCALEX
The Low Loss High Frequency Insulation

Mycalex, the highly advanced glass-bonded mica insulation, is playing a major role in today’s new electrical and electronic apparatus. Backed by more than a quarter century of research, Mycalex combines all the important properties to meet today’s and tomorrow’s more exacting needs. The name Mycalex is a registered trade mark identifying the glass-bonded mica insulating materials of Mycalex Corporation of America. This concern, 100%, American in ownership and operation, is not affiliated with any other firm or corporation. It obtained its patents from the parent firm of Great Britain and owns exclusively U.S. patents and patent applications. Mycalex is made by exclusive formulae and exclusive patented processes.

Product designers everywhere are taking full advantage of Mycalex and its unique combination of characteristics: low loss factor, particularly at ultra high frequencies; imperviousness to water and oil . . . dimensional stability and high dielectric strength . . . freedom from carbonization and frosty cold flow . . . its affinity for bonding with metals, adaptation to molding and precise machinability.

Mycalex is available in 3 Types, as follows:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>Compression Molded For High Frequency Use</td>
</tr>
</tbody>
</table>

Mycalex 400 is particularly suited to high frequency applications. Even at 10 cycles its loss factor is well within requirements for operation in this portion of the electromagnetic spectrum. An outstanding characteristic is the long frequency range over which the loss factor is a minimum.

With its unusually fine and uniform texture Mycalex 400 has great strength and ability to withstand vibration. It is readily machinable to close tolerances.

VERSATILE IN APPLICATION—There is scarcely any limit to the exacting uses to which Mycalex 400 can be put. In tropical climates its exceptional electrical and physical properties are unimpaired. Hence it is ideal for insulation of radio transmitters and receivers, panels for communications apparatus, switchboard panels for coal mines, arc shields in high tension switches, relay contact supports, brush holders and X-Ray equipment.

FORMS AVAILABLE—Sheets 14 by 18 inches, usual thicknesses of 1/8 to 1 inch. Special orders in thicknesses of 3/32 and 1/16 inch. Rods 18 inches long have diameters from 1/4 to 1 inch.

ELECTRICAL PROPERTIES
grade 4-4 in accordance with JAN-1-10

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power factor, 1 megacycle</td>
<td>0.0018</td>
</tr>
<tr>
<td>Dielectric constant, 1 megacycle</td>
<td>7.4</td>
</tr>
<tr>
<td>Loss factor, 1 megacycle</td>
<td>0.013</td>
</tr>
<tr>
<td>Dielectric strength, volts/mil</td>
<td>500</td>
</tr>
<tr>
<td>Arc resistance, ASTMs</td>
<td>300</td>
</tr>
<tr>
<td>Volume resistivity, ohm-cm</td>
<td>2 x 10^10</td>
</tr>
<tr>
<td>Surface resistance, megohms</td>
<td>300,000</td>
</tr>
</tbody>
</table>

MECHANICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, lb./cu. in.</td>
<td>0.11</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>3.0</td>
</tr>
<tr>
<td>Impact strength (Charpy)</td>
<td>3.0</td>
</tr>
<tr>
<td>Tensile strength, psi</td>
<td>6,000</td>
</tr>
<tr>
<td>Compressive strength, psi</td>
<td>35,000</td>
</tr>
<tr>
<td>Transverse strength, psi</td>
<td>15,000</td>
</tr>
<tr>
<td>Hardness, Brinell</td>
<td>50</td>
</tr>
<tr>
<td>Water absorption, 48 hours</td>
<td>0.1%</td>
</tr>
<tr>
<td>Thermal conductivity, Btu./sq.ft./hr./°F/in.</td>
<td>3.5</td>
</tr>
<tr>
<td>Maximum safe operating temperaure, °C</td>
<td>400</td>
</tr>
</tbody>
</table>

SIZES AND WEIGHTS

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Weight</th>
<th>Diameter</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8</td>
<td>3.5</td>
<td>1/4</td>
<td>0.093</td>
</tr>
<tr>
<td>3/16</td>
<td>5.2</td>
<td>3/8</td>
<td>0.21</td>
</tr>
<tr>
<td>1/4</td>
<td>6.9</td>
<td>1/2</td>
<td>0.36</td>
</tr>
<tr>
<td>3/8</td>
<td>10.1</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>13.8</td>
<td>5/8</td>
<td>0.60</td>
</tr>
<tr>
<td>5/8</td>
<td>17.2</td>
<td>3/4</td>
<td>0.86</td>
</tr>
<tr>
<td>3/4</td>
<td>20.5</td>
<td>7/8</td>
<td>1.16</td>
</tr>
<tr>
<td>7/8</td>
<td>24.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>27.3</td>
<td>1</td>
<td>1.51</td>
</tr>
</tbody>
</table>

COMPARISON OF MYCALEX

<table>
<thead>
<tr>
<th>Insulating materials</th>
<th>Porcelain</th>
<th>Steatite</th>
<th>Thermo-plastics</th>
<th>Thermo-setting Plastics</th>
<th>Electrical Glass</th>
<th>Mycalex 400</th>
<th>Mycalex 410</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss factor less than 0.016 at 1 megacycle</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume resistivity greater than 1 x 10^10 ohm-cm</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dielectric strength greater than 300 v/mil</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sp gr less than 3.0</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No dimensional change on aging</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moldability or machinability to close tolerances</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexural strength greater than 12,000 psi</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water absorption less than 0.1% (48 hrs)</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freedom from carbonization</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal inserts molded into insulator</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temp above 600°F</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average rating</td>
<td>45%</td>
<td>73%</td>
<td>64%</td>
<td>45%</td>
<td>88%</td>
<td>91%</td>
<td></td>
</tr>
</tbody>
</table>

* Measured after 48 hours immersion in distilled water.
† The type which most closely meets requirements listed.
‡ Usually special alloys.
Many ceramic materials offer low power factor, negligible moisture absorption, high dielectric strength, absence of cold flow and ability to withstand high temperatures. But few combine these advantages with a dielectric constant greater than 7 or 8 at radio frequencies. Still fewer also provide flat surfaces of large dimensions without warpage or rods to close tolerances.

Mycalex K capacitor dielectrics combine all the above advantages. Moreover, Mycalex K is available in almost any form desired: sheets, rods or irregular shapes with or without metal inserts.

Power factors of Mycalex K series vary from 0.002 to 0.004 at one megacycle. Temperature coefficients vary from positive to zero to negative.

### Sheets, Rods

<table>
<thead>
<tr>
<th>Composition</th>
<th>Dielectric Constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-8</td>
<td>8.5</td>
</tr>
<tr>
<td>Mycalex K-10</td>
<td>10.6</td>
</tr>
<tr>
<td>K-15</td>
<td>14.6</td>
</tr>
<tr>
<td>K-20</td>
<td>19.7</td>
</tr>
</tbody>
</table>

*All of the above compositions are machinable by the same methods used for Mycalex 400.*

### Irregular Shapes

Mycalex KM gives the engineer a greatly enlarged choice of designs. In the following series it presents a group of irregular or complex shapes which may or may not incorporate metal inserts directly into the dielectric.

<table>
<thead>
<tr>
<th>Composition</th>
<th>Dielectric Constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>KM-10</td>
<td>10.5</td>
</tr>
<tr>
<td>KM-15</td>
<td>13.5</td>
</tr>
<tr>
<td>KM-20</td>
<td>20.0</td>
</tr>
<tr>
<td>KM-30</td>
<td>29.0</td>
</tr>
<tr>
<td>KM-40</td>
<td>48.3</td>
</tr>
<tr>
<td>KM-50</td>
<td>61.0</td>
</tr>
<tr>
<td>KM-60</td>
<td>83.8</td>
</tr>
</tbody>
</table>

### Properties of K-10

grade HICSH4, in accordance with JAN-1.12

- Dielectric constant, 1 megacycle: 10.6
- Q-factor, 1 megacycle: 310
- Loss factor, 1 megacycle: 0.034
- Volume resistivity, ohm-cm: 3.0 × 10^11
- Dielectric strength, volts/mil (0.10 in. thickness): 270
- Fractional decrease of capacitance with temperature change: 0.0056
- Fractional increase of capacitance with temperature change: 0.0076
- Porosity (dye penetration after 6 hours at 10,000 psi): 0
- Modulus of rupture, psi: 9,000
- Density, lb./cu. in.: 0.116
- Specific gravity: 3.32
- Maximum safe operating temperature, °C: 400

### MYCALEX 410

This form of Mycalex is useful in three cases:

- When the shape of a required part is too intricate to permit fabrication by machining.
- When design is simple enough for machining, but quantities needed necessitate high production and low cost.
- When metal inserts must be incorporated into the insulator.

**Inserts**

May be made of any common metal that can withstand temperatures of about 1200 °F and that has a coefficient of thermal expansion of the order of 100 to 175 × 10^-7 per degree C. Included are cold rolled steel, copper, nickel, aluminum, Monel, Inconel, etc.

**Seal**

One of the most important developments is a Mycalex-metal seal that withstands air pressure of 90 psi. This seal is useful in such application as terminals and multi-terminal headers for transformers, capacitors, vibrators and crystal holders.

### MYCALEX FABRICATION

The Mycalex Corporation of America—pioneer in insulation advancement—machines Mycalex to customers' exact specifications in its new plant. Covering 55,000 square feet, this factory is especially tooled for large volume of a wide variety of parts. It affords precision workmanship, reduced costs and prompt deliveries.

Tell us your insulation problems. We invite your inquiries.
These electronic components are examples of the superiority of SUPER design and craftsmanship techniques. Built into each is the kind of durable quality and performance that complement the units in which they are used.

In addition to the components described, SUPER will build to customer specification.

### Use of the Following SUPER Electric Co. Components

<table>
<thead>
<tr>
<th>Component</th>
<th>420 mmf RMA Standard Gang</th>
<th>365 mmf RMA Standard Gang</th>
<th>35 mmf</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Oscillator Coil</strong></td>
<td>535–1620 kc</td>
<td>5.6 mc</td>
<td>19.25 mc</td>
</tr>
<tr>
<td><strong>Loop Antenna</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Antenna Coil</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>R-F Interstage Transformer</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Band Pass Antenna Coil</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Band Pass R-F Coil</strong> (Double Tuned)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Standard I-F Transformers 455 kc**

**Standard F-M Coils**

- I-F 10.7 mc (¾” x ¾” and 1¼” x 1½” Square Can)
- Combination AM-FM I-Fs, 455 kc and 10.7 mc

**Television Coils**

- Video I-Fs 12.75 mc and 26.4 mc
- Video I-F Assemblies Center Frequency 23.52 mc
- Sound I-Fs 21.9 mc

**Sound Discriminator** — 21.9 mc

**Video Peaking and Filter Coils**

**Loop Antennas by SUPER**

1. Multi-Band Combination Loop Antenna and Radio Back
2. Broadcast Loop Antenna and Radio Back Combination with Phone Jack, Outside Antenna Connection, Aligning Trimmer
3. High Q Loop Antenna, Polyethylene Insulated Wire
4. Basket Weave Loop Antenna

**SUPER Electric Products Corporation**

1057 Summit Avenue • Jersey City 7, N. J.
INDEX OF PRODUCTS

Acetate, Cellulose
Sheets, Rolls, and Slat Coils

Adhesive Tapes (With Adhesive on One Side)
For Electrical and Industrial Applications—
Permacel Cloth Electrical Tapes (formerly Joflex)
Permacel Paper Electrical Tapes—Crepe and Flatback
Permacel Acetate Film Electrical Tapes
Permacel Acetate Cloth Electrical Tapes
Texcel (Cellophane) Transparent Adhesive Tapes
Permacel Coated Cloth Electrical Tape (formerly Electape)
Vartex Varnished Cambric Adhesive Tapes

Asbestos
Asbestos Woven Listing Tapes and Sleevings
Paper and Paper Electrical Tapes

Bakelite, Laminated
Paper, Linen, and Canvas Base Laminated Sheets
Fiberglass and Asbestos Laminated Sheets
Laminated Bakelite Rods and Tubes
Fabricated Parts Made from Sheets, Rods, and Tubes

Compounds, Pedigree Insulating
Impregnating, Sealing, and Filling Compounds

Cotton Tapes, Sleevings, and Twines
Untreated Cotton Tapes, Stay Bindings, Webbings, and Tying Tapes
Untreated Silk, Rayon, Nylon, and Silk Replacement Tapes
“Non-Ravel” Straight Cut Cotton Tapes
Untreated Cotton Sleevings—All Standard Colors
Varnished Cambric Tapes (Bias and Straight Cut)
Varnished, Saturated, and Impregnated Tubings and Sleevings
Cotton Armature Twines

Fiberglas Woven Glass Textile Products, Owens-Corning
Untreated and Treated Fiberglas Tapes, Sleevings, and Tying Cords
Varnished Fiberglas Cloth and Tapes
Varnished Fiberglas Tubings and Saturated Sleevings
Micra-Fiberglas Combination Slot Insulations
Micra-Fiberglas Flexible Sheets and Tapes
Fiberglas Base Laminated Sheet Bakelite
Silicone Coated Fiberglas Cloth

Fibre and Fishpaper
Fishpaper and Hard Fibre Sheets, Rolls, and Slat Coils
Hard Vulcanized Fibre Rods and Tubes
Rogers Fibre Rodco Boards
Fabricated Parts Made from Sheets, Rods, and Tubes

Frision and Rubber Tapes
Mica Products, Macallen Compressed Sheet
Moulding and Segment Mica Plates for Commutators
Flexible Mica Plate for Cold Forming or Moulding
Mica Tubes, Bushings, and Sleeves
Punched and Moulded Mica Segments, V-Rings, and Slot Coils

Distributors for THE FOLLOWING MANUFACTURERS

THE MACALLEN COMPANY
Compressed Sheet Mica Products
NEW JERSEY WOOL WINDING COMPANY, Inc.
Varnished Cambric Cloth Tapes
Varnished Fiberglas Products
Vartex Silicone Resin Coated Fiberglas Extruded Tubing, Resinous Products, etc.
OWENS-CORNING FIBERGLASS CORPORATION
Woven Glass Electrical Textile Products
DOW CORNING CORPORATION
Silicone Resins, Fluids, and Varnishes
THE P. D. GEORGE COMPANY
“Pedigree” Insulating Varnishes and Compounds
JOHN A. MANNING PAPER COMPANY, Inc.
Manning Insulating Papers and Pressboards
SUFLEX CORPORATION
Dieflex Varnished Tubings and Saturated Sleevings
INDUSTRIAL TAPE CORPORATION
Electrical and Industrial Adhesive Tapes
NATIONAL VULCANIZED FIBRE
Hard Vulcanized Sheet Fibre, Rods, Tubes
Rogers Fibre Company
R, Rodeo, K Insulation Fibres
AND OTHER OUTSTANDING MANUFACTURERS

ELECTRONICS BUYERS’ GUIDE — June, 1947 — MID-MONTH

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Cleveland 14: 1231 Superior Ave., N.E.
Dayton 2: 1315 Mutual Home Building

Detroit 2: 11341 Woodward Ave.

Peoria 5: 101 Heinz Court

Mica Cloth, Mica Paper, Cellophane-Mica and Other Mica Combinations
Mica Tapes with Silk, Paper, Rayon, Cellophane, Fiberglas, and Other Backings
Fiberglas-Mica Combinations in Sheets, Rolls, or Tapes
Mica Heater Plate and Pure Mica Parts for Heating Appliances
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Manning 200 and 50 Part Rag, High-Density Insulating Papers
Iumanco Tan Woodpile Insulating Paper
Manning 794 Rope Insulating Paper
Manning Pressboard and Pullerboards
Red Insulating Paper and Crepe Paper Tapes
Papers Combinations with Cellulose Acetate
Cuffed and Fabricated Slot Insulation and Other Specialties
Varnished Papers

Resinous Products, Plastic
Extruded Plastic Tubings
Resinous Tapes and Sheets
Ethanol Sheetings

Silicones, Dow Corning
Silicones, Resins, Fluids, Varnishes, etc.

Silks and Silk Replacements
Untreated Silk, Rayon, NyIon, and Silk Replacement Tapes
Silk and Rayon Backed Mica Tapes
Varnished Silk and Rayon Cloth, Tapes, and Fabricated Parts
Vartex Type 128 Varnished Cloth (Silk Replacement)

Twines, Cotton, Linens, and Fiberglas Armature
Varnishes, Pedigree Insulating
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Varnished Products and Combinations, Vortex
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Varnished Silk and Rayon and Canvas Duck
Vartex Type 128 Varnished Cloth (Silk Replacement)
Vartex Varnished Asbestos Cloth
Varnished Fiberglas Cloth and Tapes
Varnished Papers
Silicone Coated Fiberglas Cloth

Varnished Tubings and Saturated Sleevings, Dieflex
Flexible Varnished Tubings and Saturated Sleevings
Fiberglas Flexible Varnished Tubings and Saturated Sleevings
Vanelex Markers and Other Varnished Tubing Specialties

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See list below for booklets of interest to you.

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Graybar Electric Company
420 Lexington Avenue, New York 17, N. Y.

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No Contact Pitting
No Open Arcing

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you'll find it in the advertising pages of this
BUYERS' GUIDE
THE REFERENCE BOOK OF THE ELECTRONIC DESIGN ENGINEER

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
There Is An Audiodisc And An Audiopoint
For Every Recording Need

AUDIODISCs have all of the features essential to high fidelity recording. A superior lacquer is applied by a unique process that gives a flawless surface. In cutting, the thread throws well and there is no static. In playback, whether at once or in the future, there is low surface noise. Their playback life is unequalled. They have five types of AUDIODISCs:

RED LABEL tops all accepted quality standards for professional use. Double-sided in 6¼", 8", 10", 12" and 16" diameters.

SINGLE FACE RED LABEL brings new economy to applications requiring but one side, 12" and 16" diameters.

YELLOW LABEL double-sided discs are of high uniform quality and the popular choice for all general purpose recording. Sizes same as red label.

REFERENCE permits extreme economy in test cuts, filing and reference recordings. Double-sided in 10", 12" and 16" diameters.

MASTERS give fine results with either the gold spotting or silvering process. The outstanding choice where precision is to be made. Double or single face in 12", 15¼" and 17¼" diameters.

BLUE LABEL is low cost double-sided discs with the same recording lacquer as professional Audiodiscs, but on thinner aluminum base, 6¼", 8", 10".

AUDIODISCs are manufactured on aluminum base.

AUDIODISCs are made by skilled craftsmen, are available in five types of recording styli. Cutting and playback points are matched to give finest performance.

RECORDING POINTS

1. SAPPHIRE No. 14, for professionals, designed to give proper thread throw for fine work.

2. STELLITE No. 34, professional type. Cuts quiet, short grooves for several hours.

3. DIAMOND-LAPPED STEEL No. 36, cuts a fine, smooth groove. Last phase from 15 to 20 minutes actual recording time.

PLAYBACK POINTS

1. SAPPHIRE No. 112, finest playback.

2. BENT SHAKE STEEL No. 114, No. 112, for heavy pick-ups.

3. STRAIGHT SHAKE STEEL No. 115, for light pick-ups.

Audio's re-sharpening service gives real economy in the use of Audiodiscs. Nov. 14, 34 and 112. Consult your local dealer.

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AUDIOPWAYS, INC., 444 MADISON AVE., N. Y. C.

EXPORT DEPT. ROYAL INTERNATIONAL, 15 EAST 40TH STREET, NEW YORK 16, N. Y.

they speak for themselves audiopoints

ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH
LAPP GAS FILLED CONDENSERS

In any electronic circuit, wherever lump capacitance is needed, Lapp condensers will save space, save power and save trouble. Available for duty at almost any useable voltage rating and capacitance, they bring to any application notable mechanical and electrical advantages: non-deteriorating dielectric, small space requirement, non-failing, puncture-proof design, constant capacitance under temperature variations. Variable, adjustable and fixed capacitors are available. Fixed condensers have been made with capacitance up to 60,000 mmf., variable and adjustable up to 16,000 mmf. Current ratings range up to 500 amperes R. M. S., and voltage ratings up to 60 Kv peak.

LAPP PORCELAIN WATER COILS

For cooling of high-frequency tubes in radio transmitters and other electronic power sources, Lapp porcelain water coils have been widely used. With nothing about the porcelain to deteriorate, sludging is eliminated, and with it the need for cleaning and water changes. Porcelain pipe and fittings in any needed size are also available as catalog items.

For high-power, high-frequency circuits, the Lapp specialties shown on these pages provide electrical and mechanical characteristics that mean improved efficiency, dependability and reduced maintenance.

For more than 25 years Lapp has been insulating radio-frequency circuits. The first vertical radiators in the broadcast industry were insulated by Lapp porcelain; Lapp water coils first eliminated water sludging and improved performance for water-cooled tubes; the Lapp gas-filled condenser offered first completely-dependable performance in a puncture-proof constant-capacitance unit.

Today Lapp has considerable specialized capacity for production of porcelain and steatite pieces as well as the associated metal parts. And with it the skilled, sensible engineering that creates parts that will do their jobs—right. Lapp Insulator Co., Inc., LeRoy, N. Y.
STANDOFF, BOWL, ENTRANCE INSULATORS Standoff, bowl, entrance and other special-purpose insulators are available in wide range as standard catalog items. Other insulators for special duty or of special design are easily produced by Lapp methods, in porcelain or steatite.

ANTENNA STRUCTURE INSULATORS Footing, sectionalizing and guy insulators—for self-supporting towers and guyed masts—are available from Lapp in more than 100 designs. With Lapp insulators, antenna structures can be insulated for any electrical or mechanical service.

“A million pounds on a teacup.” This Lapp compression cone is a supporting insulator for a guyed-mast radiator. With a wall thickness of 27/8 inches of porcelain, it is proof-tested at 1,500,000-lb. loading. The unit withstood 3,000,000 lbs. on design test.

All Lapp footing and guy insulators incorporate the Lapp patented curved-side compression cone (right). With the same dimension and same wall thickness, the curved-side cone has double the strength of the straight-side cone (left).
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<td>100 kHz to 1 kHz</td>
<td>±1%</td>
<td>±2%</td>
<td>1 watt</td>
<td>500 ohms</td>
<td>less than 1%</td>
<td>60 db below output at 100 mc (with input)</td>
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<tr>
<td>100 kHz to 10 kHz</td>
<td>±1%</td>
<td>±2%</td>
<td>10 watts</td>
<td>1000 ohms</td>
<td>less than 1%</td>
<td>60 db below output at 100 mc (with input)</td>
</tr>
<tr>
<td>100 kHz to 100 kHz</td>
<td>±1%</td>
<td>±2%</td>
<td>100 watts</td>
<td>1000 ohms</td>
<td>less than 1%</td>
<td>60 db below output at 100 mc (with input)</td>
</tr>
<tr>
<td>10 MHz to 1 GHz</td>
<td>±1%</td>
<td>±2%</td>
<td>1000 watts</td>
<td>50, 100, 500, 1000 ohms (Ref. 600 ohm)</td>
<td>less than 1%</td>
<td>60 db below output at 100 mc (with input)</td>
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<td>20 MHz to 2 GHz</td>
<td>±1%</td>
<td>±2%</td>
<td>10,000 watts</td>
<td>600 ohms</td>
<td>less than 1%</td>
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<td>30 MHz to 3 GHz</td>
<td>±1%</td>
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<td>100,000 watts</td>
<td>600 ohms</td>
<td>less than 1%</td>
<td>60 db below output at 100 mc (with input)</td>
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<tr>
<td>100 MHz to 1 GHz</td>
<td>±1%</td>
<td>±2%</td>
<td>1,000,000 watts</td>
<td>600 ohms</td>
<td>less than 1%</td>
<td>60 db below output at 100 mc (with input)</td>
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<tr>
<td>1 GHz to 10 GHz</td>
<td>±1%</td>
<td>±2%</td>
<td>10,000,000 watts</td>
<td>600 ohms</td>
<td>less than 1%</td>
<td>60 db below output at 100 mc (with input)</td>
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<tr>
<td>10 GHz to 100 GHz</td>
<td>±1%</td>
<td>±2%</td>
<td>100,000,000 watts</td>
<td>600 ohms</td>
<td>less than 1%</td>
<td>60 db below output at 100 mc (with input)</td>
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<tr>
<td>100 GHz to 1 THz</td>
<td>±1%</td>
<td>±2%</td>
<td>1,000,000,000 watts</td>
<td>600 ohms</td>
<td>less than 1%</td>
<td>60 db below output at 100 mc (with input)</td>
</tr>
</tbody>
</table>

**IMPEDANCE**

- **Output:** 1.0 volts into 500 ohms
- **Input:** 1.0 volts into 500 ohms

**IMPEDANCE**

- **Output:** 1.0 volts into 500 ohms
- **Input:** 1.0 volts into 500 ohms

**IMPEDANCE**

- **Output:** 1.0 volts into 500 ohms
- **Input:** 1.0 volts into 500 ohms

**IMPEDANCE**

- **Output:** 1.0 volts into 500 ohms
- **Input:** 1.0 volts into 500 ohms

## MISCELLANEOUS CHARACTERISTICS

- **Wave Shape:** Square
- **Distortion:** total not more than 0.1% at 100 mc (with input)
- **Wave Shape:** Square
- **Distortion:** total not more than 0.1% at 100 mc (with input)
- **Wave Shape:** Square
- **Distortion:** total not more than 0.1% at 100 mc (with input)
- **Wave Shape:** Square
- **Distortion:** total not more than 0.1% at 100 mc (with input)
- **Wave Shape:** Square
- **Distortion:** total not more than 0.1% at 100 mc (with input)
- **Wave Shape:** Square
- **Distortion:** total not more than 0.1% at 100 mc (with input)

**CONSISTENCY**

- **Output:** 1.0 volts into 500 ohms
- **Input:** 1.0 volts into 500 ohms

**CONSISTENCY**

- **Output:** 1.0 volts into 500 ohms
- **Input:** 1.0 volts into 500 ohms

**CONSISTENCY**

- **Output:** 1.0 volts into 500 ohms
- **Input:** 1.0 volts into 500 ohms

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- **Output:** 1.0 volts into 500 ohms
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- **Output:** 1.0 volts into 500 ohms
- **Input:** 1.0 volts into 500 ohms

**CONSISTENCY**

- **Output:** 1.0 volts into 500 ohms
- **Input:** 1.0 volts into 500 ohms

## Brief specifications of these nationally known instruments are shown here. Full details are available in the new—hp—catalog. Write for your free copy, today.
AM Among the first to design, build and operate transmitters in the AM field, General Electric has always maintained its interest in advancing the art and technical development of this phase of broadcasting. The 250 watt AM transmitter shown here is the first of a completely new line that includes all types, from the lowest to the highest power ratings.

FM As a pioneer and leader in the development of FM broadcasting, General Electric has acquired the background and experience which have proved invaluable to owners and operators of new FM stations. General Electric has a complete line of FM transmitters for stations of every size.

COMMUNICATIONS In communication equipment design, General Electric has placed emphasis on quality, reliability and simplicity. Since many of the applications for radio communications equipment are in the nature of public services, extreme care has been exercised to design each unit for maximum utility. Complete systems for these services are provided, both station and mobile.

AVIATION To the pilot, the radio equipment is the most valuable instrument in his plane, since his life may depend upon it. In designing the complete General Electric line of Aviation Electronic Equipment, reliability far beyond accepted standards was demanded. The high quality that is being built into these entire lines is assurance of dependability under the most critical conditions.

TELEVISION For many years General Electric has been in the forefront in the development of television. Station WRGB has provided outstanding facilities for experiment both in technical development and in programming. This union of engineering with studio production provides General Electric with a background of experience that is of incomparable value to those entering the television field.

MARINE RADIO During the war General Electric was one of the largest producers of radar for the Armed Forces. Many of these developments have been refined and simplified for use in peace. The G-E Electronic Navigator, a peace-time marine radar, is now safeguarding merchant vessels from collision in fog and darkness, and saving shipping time. Other equipment now being developed will aid in saving untold tonnage and numbers of lives in the future.

FOR COMPLETE INFORMATION ON GENERAL ELECTRIC RADIO EQUIPMENT, WRITE OR CALL ANY OF THESE G-E OFFICES:

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187 Spring Street, N. W.

BOSTON 1, MASS.
140 Federal Street

CHICAGO 54, ILL.
1122 Merchandise Mart

CINCINNATI 2, OHIO
215 West Third St.

CLEVELAND 4, OHIO
4966 Woodland Avenue

DALLAS 2, TEX.
1801 North Lamar Street

DENVER 2, COLO.
650 17th Street

KANSAS CITY 6, MO.
106 West 14th Street

LOS ANGELES 54, CAL.
212 No. Vignes Street

MINNEAPOLIS 2, MINN.
12 Sixth Street

NEW YORK 22, N. Y.
570 Lexington Avenue

PHILADELPHIA 2, PA.
1405 Locust Street

SAN FRANCISCO 4, CAL.
235 Montgomery Street

SCHENECTADY, N. Y.
Building 267—Room 105

SEATTLE 4, WASH.
710 Second Avenue

WASHINGTON 5, D. C.
806 15th Street, N. W.

LEADER IN RADIO, TELEVISION AND ELECTRONICS

GENERAL ELECTRIC

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
There's a G-E Electronic Tube for every purpose...

...and complete data available on every tube!

Designed for and by technical men, the new G-E Electronic Tube Manuals pictured below are complete with technical and mechanical information for every tube use. Let their easy-to-read graphs and tube outlines help to solve your application problems.

For prices and further information write Electronics Department, General Electric Company, Schenectady 5, N. Y.

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### BALLAST TUBES

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### THYRATRONS

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</tbody>
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### GENERAL ELECTRIC ELECTRONIC TUBES

G-E CAPACITORS

PYRANOL CAPACITORS  .  .  Small a-c Pyranol capacitors are recommended for use with motors, industrial control, and other equipment. Use of Pyranol as a treating material, because of its high dielectric strength, high permittivity, and exceptional stability, has made possible a marked reduction in physical size, as well as a far superior capacitor. Three styles of mounting brackets are available and supplied separate from the units. Units may be operated in any position. WRITE FOR BULLETIN GEA-2027.

STANDARD RATINGS

<table>
<thead>
<tr>
<th>Rated Voltage</th>
<th>Fabricated Rectangular</th>
<th>Drawn Rectangular</th>
<th>Drawn Cylindrical</th>
<th>Shallow Drawn</th>
<th>Oval Drawn</th>
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<tbody>
<tr>
<td>220</td>
<td>1-15 muf</td>
<td></td>
<td></td>
<td></td>
<td>2-6 muf</td>
</tr>
<tr>
<td>230</td>
<td>1-15 muf</td>
<td></td>
<td></td>
<td>2-3.5 muf</td>
<td>2-3.5 muf</td>
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<tr>
<td>330</td>
<td>1-17.5 muf</td>
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<td></td>
<td>2-4 muf</td>
<td>1-7.5 muf</td>
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<tr>
<td>440</td>
<td>1-28 muf</td>
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<tr>
<td>660</td>
<td>1-15 muf</td>
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</tr>
</tbody>
</table>

*Represents only a list of standard ratings. Ratings other than these listed will be supplied when required.

HIGH-FREQUENCY CAPACITORS

LECTROFILM: Designed for radio-frequency blocking and by-pass applications where "Q" and temperature coefficient of capacitance are not critical. High capacity values provide low impedance desirable in blocking and by-pass applications. Generous r-f current rating. Dependable operation at ambient of -40°C to 75°C. Mechanically interchangeable with mica capacitors to both case sizes. WRITE FOR BULLETIN GEA-4295.

STANDARD RATINGS - Case 65 type

<table>
<thead>
<tr>
<th>D-c Working Voltage</th>
<th>Capacitance, Micromicrofarads</th>
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<tbody>
<tr>
<td>3000</td>
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<tr>
<td>750</td>
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STANDARD RATINGS - Case 70 type

<table>
<thead>
<tr>
<th>D-c Working Voltage</th>
<th>Capacitance, Micromicrofarads</th>
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</thead>
<tbody>
<tr>
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<td>0.025</td>
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<tr>
<td>2500</td>
<td>0.030</td>
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<tr>
<td>3000</td>
<td>0.034</td>
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<tr>
<td>6000</td>
<td>0.01</td>
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<td>6600</td>
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<td>7500</td>
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</tr>
<tr>
<td>8600</td>
<td>0.0067</td>
</tr>
<tr>
<td>9000</td>
<td>0.0065</td>
</tr>
<tr>
<td>10,000</td>
<td>0.0056</td>
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</table>

CLASS HFP: Liquid-filled, parallel-plate capacitors specifically designed for use in the resonant circuit, or "tank circuit" of high-frequency electronic oscillators, such as those used in electronic-heater equipments. WRITE FOR BULLETIN GEA-4365.

STANDARD RATINGS

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<thead>
<tr>
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<tr>
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OTHER G-E CAPACITORS

D-C CAPACITORS (Pyranol Fixed-Paper-Dielectric) Bulletin GEA-2621
D-C CAPACITORS (Joint Army-Navy Specification JAN-C-25) Bulletin GEA-4357
ENERGY-STORAGE DISCHARGE CAPACITORS Bulletin GEA-4466
CAPACITOR NETWORKS Detailed Data Sent On Request

G-E TRANSFORMERS

DRY TYPE  .  .  HERMETICALLY SEALED; Compound-filled, and hermetically sealed against the entrance of moisture. Designed to meet U. S. Navy salt-water immersion tests.  Standard hermetic-case types range from very small units up to units of 200 v-a physical size. CONVENTIONAL COMPOUND-FILLED; Moisture-resistant but not immersion-proof. Wide application in the Frequency-Modulation field. Top or bottom mounting for open or under-deck wiring. Standard core types include units up to 250 v-a physical size. CORE-AND-COIL: Usually applied where moisture resistance is not a factor, and where size and weight must be minimized. Standard core laminations are utilized in core-and-coil units 50 kva and smaller (physical size). Special construction is employed for larger units. WRITE FOR BULLETIN GEA-4280.

LIQUID-FILLED  .  .  General Electric also manufactures liquid-filled transformers in two types. (1) OIL IMMERSED, Bulletin GEA-2400 (2) Pyranol Filled, Bulletin GEA-2048. Both are used in higher power, high voltage applications.

Core-and-coil units

Hermetically sealed units

Conventional compound-filled units
GENERAL ELECTRIC

G-E SWITCHETTES . . . Snap-action, double-break construction and a wide variety of terminal and contact arrangements makes the G-E Switchette a versatile contact mechanism suitable for many applications. These small switch mechanisms lend themselves particularly to applications where space is limited. The switches are operated by movement of the spring-return button located in the housing. The bottom can be actuated by a lever, bellevue, or other means. Available in two sizes.

Size 1, 10 amps, 115/230 volts; Size 2, 25 amps, 115/230 volts. WEIGHT: Size 1—0.02 lb., Size 2—0.125 lb.; PLUNGER TRAVEL DIFFERENTIAL: Size 1—0.020 in. ± 0.007 in., Size 2—0.040 in. Write for Bulletins GEA 38110 and GEA-4259.

G-E CALROD* SOLDERING IRONS

This new and improved line of G-E Calrod soldering irons, designed for industrial use, offers these important advantages: High-speed soldering, uniform performance, long life and low cost. Tip renewal is convenient and low-cost. For light, medium and heavy soldering. Write for Bulletin GEA-4519.

ADVANTAGES: TAKES LESS SPACE—Because of its construction, the winding-space factor of Formex wire is considerably higher than for other types. EASY TO WIND—The softness and smoothness of Formex wire permits the turns of the coil to readily fall into place. ADIRE FEET PER POUND—Because there are more feet of wire in a pound of Formex wire than on any other type, except enamelled wire, important savings are effected. FACILITATES MANUFACTURE—With its tough and resistant covering, Formex will stand up under the severe treatment of high-speed winding and assembly operations. Types available—round Formex, ultrathin Formex, rectangular Formex, covered Formex. Bulletin GEA-2911.

FORMEX* MAGNET WIRE

The result of years of study of the problem of improving the insulation of magnet wire. Insulated with a thin film of synthetic resin embodying polyvinyl-ocetal, it is superior in many respects to wire insulated with conventional enamels. It is now in extensive production and use.

G-E INDUSTRIAL ELECTRONIC CONTROLS

Industrial electronic controls as produced by G-E are completely assembled equipments engineered to meet the requirements of particular industrial applications. A few of the control systems and products available are:

AUTOMATIC WEIGHING CONTROL
PACKAGING CONTROL
CLOTH FINISHING CONTROL
AUTOMATIC COUNTERS
ELECTRONIC TIME DELAY
PAINT-SPRAYING CONTROL
SIDE ALIGNMENT CONTROL
THREAD-BREAK DETECTION
ELECTRONIC TIMER

Additional G-E Products for Electronic Fields
Ask for Bulletin giving complete information

Amplidyne control
Autotransformers, variable-voltage
Bushings, glass
Cement
Circuit breakers
Gear-motors
Generators
Inductors
Insulation materials
Motors
Oscillographs
Oscilloscope
Plastics

G-E APPARATUS SALES OFFICES LOCATED IN ALL PRINCIPAL CITIES • CONSULT YOUR PHONE BOOK FOR LOCAL ADDRESS

SMALL PANEL . . . These general-purpose panel instruments are particularly suitable for use in radio and communications equipment where accuracy and quality are required and space is at a premium. Dial, rectifier, and a.f. instruments operate on the permanent-magnet, moving-coil principle; alternating-current (a-c) instruments, on the moving-flux principle. 1 1/2 in. and 2 1/2 in. instruments find wide usage where minimum frontal dimensions and depth behind the panel are essential requirements.

In the permanent-magnet moving-coil types, minimum depth is obtained by use of a unique single-unit high-torque element, in which pivots are solidly mounted on inside of armature shell. In 3 1/2-inch and larger size the mechanism is similar to that used in larger switchboard types, except built on a smaller scale. Accuracy of these Instruments is 2% of full scale, except in audiofrequency (rectifier) types, where accuracy is 5% of full scale. Voltmeters, ammeters, milliammeters, and microammmeters available in all required ratings. All instruments are shielded, but external magnetic shields can be furnished.

SWITCHBOARD . . . These new modern instruments, combining the advantages of long scale and small size, are designed for general switchboard service. They are ideally suited to use on large transmitter, miniature switchboards, special test equipment, and all installations where space is limited. Small and compact, yet they have the same accuracy as the larger designs, and have a longer and more readable scale. Panel space occupied by one of these concentric-scale instruments is only 4 1/4 by 4 3/4 in.

THYRITE*

A nonlinear resistance material possessing unique electrical property whereby the current varies approximately as a fourth power of the applied voltage. Some of its many applications are: For protective purposes (the limb voltage surge) * As a stabilizing influence on circuits supplied by rectifiers * As a potentiometer (the division of voltage can be made substantially independent of load current) * For the control of voltage-selective circuits, either independent of, or in combination with, electronic devices. Write for Bulletin GEA-4138A.

SUPER POWER DRIVER UNITS
Sealed-tite water-proofing...highest conversion efficiency...uniform power response...unbreakable phenolic diaphragm...precision guide pin alignment...twelve month guarantee. Full advantage has been taken of all new materials and processes which have recently been made available for commercial application. Materials such as beryllium copper, thermal-setting phenolics, high temperature resistant adhesives, magnetic steels, high energy content magnets, etc., all serve to full advantage in the design of the New Atlas Driver Units. Both models have a standard 1 3/8"-1 8 male thread to fit the mounting bracket and spinnings in a manner that will resist all mechanical stress and strain. The sturdy mechanical reinforced cork-insulated, assembly and rubber rim on the bell edge also eliminate resonance or vibration of the various projector sections.

Complete with driver unit and bracket--Miniature...re-entrant high efficiency...weatherproof...excellent for "talk-back" applications. Mounting bracket permits both vertical and horizontal adjustment. **Minimum Collapsed length 23 inches.**

No Slipping...No Scratching...No Rattle...No Noise..."Full-Grip" Clutch Adjustment "Non-tip" functionally designed base. Velvet Action Telescoping...is the exclusive feature of all ATLAS microphone stands. Single-hand control is possible after Clutch has been adjusted to weight of microphone. Clutch mechanism is intemalined with a wear-proof bakelite collet. Microphone thread size is standard 3/8"-27 male. Tube finish is Super-Chrome.

P. M. BOOSTER SPEAKERS Model HU-15
Voice Coil Impedance...8 ohms
Diaphragm...Unbreakable Phenolic
Input Power...12 Watts
Bell Diameter...8 1/2 inches
Overall Depth...8 1/2 inches
Finish...Grey Enamel
List Price...$34.00

**VELVET ACTION**

No Slipping...No Scratching...No Rattle...No Noise..."Full-Grip" Clutch Adjustment "Non-tip" functionally designed base. Velvet Action Telescoping...is the exclusive feature of all ATLAS microphone stands. Single-hand control is possible after Clutch has been adjusted to weight of microphone. Clutch mechanism is intemalined with a wear-proof bakelite collet. Microphone thread size is standard 3/8"-27 male. Tube finish is Super-Chrome.

**"Velvet Action" MICROPHONE STANDS**

MODEL | BASE FINISH | BASE DIAM. | HEIGHT ADJ. | WEIGHT | LIST PRICE
--- | --- | --- | --- | --- | ---
MS-12C | Grey Crackle | 10" | 35" to 65" | 12 lbs. | $9.40
MS-11C | Full Chrome | 10" | 35" to 65" | 12 lbs. | $11.40
MS-20 | Grey Shrilve | 12" | 42" to 72" | 15 lbs. | $14.00
MS-24 | Grey Shrilve | 12" | 42" to 72" | 24 lbs. | $19.50
**CS-1** | Collapsible | 12" | Collapsible | 5 lbs. | $15.00

**"Velvet Action" DESK STANDS**

**All Prices Subject to Change Write for Complete Catalog**

**REENTRANT PROJECTORS**
Non-resonant...uniform response...sturdy...storm-proof...compact. The various sections of all "DR" Projectors are joined by a husky cast metal central support which securely holds the heavy driver unit, mounting bracket, and spinings in a manner that will resist all mechanical stress and strain. The sturdy mechanical reinforced cork-insulated, assembly and rubber rim on the bell edge also eliminate resonance or vibration of the various projector sections.

**PARABOLIC Baffles**
Three Sizes: for 6", 8", 12" CONES. All models incorporate the new exclusive vibration-proof...interlocking...watertight seal between sections.

**"BABY BOOM" EXTENSION ARM and BRACKET CLAMP**
Baby Boom may be attached to any microphone stand or to bracket clamp. Boom 32" long, bracket clamp 6" high. MODEL BB-1 BABY BOOM ARM......LIST $7.00
MODEL BC-1 BRACKET CLAMP......LIST $3.00
YOU GET QUALITY PLUS ENGINEERING SERVICE WITH G-E PERMANENT MAGNETS

THE MAGNET WITH A VOICE

A voice coil wound on an aluminum base moving in the field of an ALNICO 5 permanent magnet—that's the heart of the modern G-E loudspeaker. Current passing through the coil in the magnetic field causes the coil and attached cone to vibrate in proportion to the applied alternating voltage, thus producing sound waves. ALNICO 5 offers maximum energy with reduced size and weight, minimum losses and increase of sensitivity and power.

General Electric's precise quality control methods used throughout magnet production, plus accurate testing and rigid inspection assure you of receiving magnets of the highest uniform quality for your application.

Greater flexibility of magnet design is possible with the many G-E permanent magnet materials now available. The large group of sintered and cast ALNICO alloys has been augmented by the lightweight, non-metallic mixture, VECTOLITE, and by the ductile permanent magnets, CUNICO, CUNIFÉ and SİLMANAL. From such a wide choice of materials, you may now find a magnet better suited for your application or a material which will make possible new designs heretofore impractical or impossible.

General Electric engineers, backed by research and application experience, have acquired years of "know-how" in selecting the best permanent magnet material and properly designing magnets for thousands of products. These engineers are at your service. Metallurgy Division, Chemical Dept., General Electric Co., Pittsfield, Mass.

SEND FOR NEW BULLETINS ON G-E PERMANENT MAGNETS

We shall be glad to send you upon request our new bulletins, CDM-1, "Permanent Magnets," and CDM-2, "Cast and Sintered Alnico, Catalog Supplement," both specifically designed to help you with your permanent magnet problems. CDM-1 contains information about the characteristics and properties of G-E permanent magnet materials, their application and design. Listed in the catalog supplement, CDM-2, are sintered and cast Alnico permanent magnets available from stock. Proposed R.M.A. standard speaker magnets are included.

For your copies, please fill out the coupon below.

METALLURGY DIVISION
SECTION BG
CHEMICAL DEPARTMENT
GENERAL ELECTRIC COMPANY
PITTSFIELD, MASS.

Please send me your new bulletin, CDM-1 and CDM-2, on G-E Permanent Magnets.

NAME:__________________________________________
TITLE:__________________________________________
COMPANY:______________________________________
ADDRESS:_______________________________________
CITY:____________________STATE:________________

PERMANENT MAGNETS

GENERAL ELECTRIC

ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH
SIGNIFICANT DATES

1881 Edison disclosed in U.S. patent No. 307,031, October 21, 1884, expiring October 21, 1901 that electric current flowed through a vacuum

1885 Sir William Preece, London Electrician, April 4, pointed out that a reversal of the anode potential resulted in decreased Edison current

1889 Elster and Geitel stated that current was due to negative ions, now known as electrons

1890 Sir Ambrose Fleming described his experiments with the Edison effect in London Electrician, February 21 and 28

1897 J. W. Howell, an associate of Edison, at an AIEE meeting pointed out that rectification took place in the tube, that is, a conversion of alternating to pulsating current

A. E. Kennelly, at the same meeting, said “a vacuum tube . . . is capable of supplying alternating current from continuous current, and also continuous current from alternating current”

1900 Lenard in Annalen der Physik showed that the electron flow inside a tube could be controlled by electrostatic forces near the cathode

1903 Wehnelt showed the effect of increasing the current emission by coating the cathode with oxides of the alkaline earths, in Physikalische Medizinische Societat

1905 Fleming patented the use of the Edison tube as a detector of wireless waves, both as a single- and full-wave rectifier, U.S. Patent No. 803,684, November 7, expiring November 7, 1922

1906 Von Lieben, German patent No. 179,807, filed March 4, issued November 19, 1906, disclosed how a control element could govern the electron stream through the tube and, hence, the current through a local relay circuit; how small energy in the input would “release current oscillations of large energy” in the output

1906 DeForest filed U.S. patent No. 841,387, October 25, granted January 15, 1907, showing that the control element could be either inside or outside the tube. This is the famous deForest patent

1907 Stone and Cabot filed U.S. patent No. 884,110, January 4, issued April 7, 1908, showing a sieve-like grid

1911 Von Lieben and Riesz filed U.S. patent No. 1,038,910, January, issued September 17, 1912, showing how the introduction of a small amount of gas increased the current capacity of a tube

1911 Von Lieben and Riesz, French patent No. 13,726, filed April, issued June 17, 1911, described a two-tube cascade amplifier

1913 Langmuir multi-grid tube, U.S. patent No. 1,558,437, issued October 29, 1913

1915 White, in U.S. patent No. 1,159,307, November 2, 1915, showed use of getter


1917 Langmuir, U.S. patent No. 1,244,216 October 23, 1917, thoriated filament

1919 Nicholson, U.S. patent No. 1,459,412, September 10, issued June 19, 1923, indirectly-heated cathode

The ROOTS

By KEITH HENNEY

ALTHOUGH electronics is young as an industry, its roots go deep. Drawing sustenance from distinguished prior arts developed by many of the greatest scientists of history, it is solidly based. Many early workers and their accomplishments are shared with other branches of engineering endeavor; some are peculiarly electronics’ own.

Founded on highly complex natural phenomena, its literature leaning heavily on the language of the mathematician, electronics can be said barely to have started on its climb upward on the growth curve characterising new industries. Significant are the facts that there are now 30,000 subscribers to ELECTRONICS where there were only 6,000 in 1930; that the amounts of power used in electronic heating alone are already greater than the quantities consumed by broadcast stations.

DEFINITION

A few of the significant inventions, discoveries and facts making up the groundwork on which electronics stands are listed here in a recital which is overly brief and which ends at the period when the disputes arose as to who invented what and when.

First, however, just what is electronics?

Proposed definitions depend upon one’s point of view. To a physicist, interested in digging out basic facts and not in their application, electronics starts and ends with a search for facts about the electron itself and its interrelations with other fundamental

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Fleming patented the use of Edison's tube as a detector for wireless signals. Drawing taken from his U.S. patent No. 803,694.

Fleming showed in his patent granted in 1904 the use of two tubes as a full-wave rectifier.

This drawing from the von Lieben German patent No. 179,827 showed an oxide coated cathode, a control element and an external relay circuit through which amplified current flowed.

An illustration from deForest U.S. patent No. 841,387 showing a control element adjacent to the cathode but on the opposite side from the anode.

Taken from deForest's U.S. patent No. 879,522 granted February 18, 1908.

From the Stone and Cabel U.S. patent No. 684,113 of April 7, 1908.

Electronics, strictly speaking, began with Edison’s monumental discovery that uni-directional current would flow across an evacuated space inside one of his incandescent lamps. This he patented in 1884. There was a considerable time lapse before the Edison effect was put to use, but after this incubation period events moved somewhat faster as fundamental facts were amassed.

Without digging too deeply into the subsoil of history, one can say that the real roots of electronics are the discoveries of Ampere, Oersted, Gauss, Henry, and Faraday, the inventions of Morse and Bell (1848 and 1875 respectively). Practical usage of electronics can be traced directly to Maxwell, whose celebrated equations were set forth in 1873, and Hertz’ brilliant experiments in 1881, both regarded as classroom curiosities for a half century.

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A breakdown of the present and potential future market for 119 basic types of electronic equipment in each of 28 major industries defined below. Chart on following three pages shows present general use by a solid dot, and slight or future use by a hollow dot

By John Markus

Classification of Industries

The following definitions give the scope assumed for each of the 28 industries represented in the accompanying chart of electronic equipment usage

**AIR TRANSPORTATION**—operation and maintenance of all types of aircraft, including communication and navigation

**CERAMICS**—manufacture of all products made from earth by agency of fire, except glass

**CHEMICAL**—manufacture of all chemical products not separately listed here, including drugs and medicines, and industrial processing with chemicals

**COMMUNICATION**—transmission of intelligence in visual or audible form, by radio waves, light beams, ultrasonic waves, infrared beams, wires, etc.

**CONSTRUCTION**—building roads, bridges, buildings, tunnels, and other fixed structures

**COSMETICS**—manufacture of all products intended to beautify and improve the human skin, complexion, hair, etc.

**ELECTRONIC & ELECTRICAL MANUFACTURING**—production of electrical equipment such as motors and generators, all equipment using electron tubes, and all tubes and electrical components used therein or in general manufacturing

**ENTERTAINMENT**—operation and maintenance of equipment used in broadcasting, television, facsimile, sound recording and reproduction, sound films, and electronic musical instruments

**FOOD**—growing of all basic foodstuffs and processing for consumption, not including packaging

**GLASS**—production and fabrication of all types of glass, and manufacture of glass products

**HIGHWAY TRANSPORTATION**—operation and maintenance of all vehicles moving on the highways or across-country without guidance of rails, including communication

**LABORATORY**—research, development, or training laboratories in industry and schools, but not medical laboratories

**MANUFACTURING, GENERAL**—all industrial production other than electronic and electrical

**MARINE TRANSPORTATION**—operation and maintenance of all craft moving on or under water, including communication and navigation

**MEDICAL**—research in schools and laboratories, diagnosis, treatment, and surgery

**METAL PRODUCING**—all operations associated with conversion of mined ore to billets, ingots, and other shapes of raw stock, including foundries, smelters, refineries, furnaces, rolling mills, etc.

**METAL WORKING**—conversion of raw metal stock to finished form by rolling, extrusion, casting, spinning, punching, drilling, welding, machining, etc., but not including assembly of metal parts into finished products (see manufacturing, general)

**MINING**—extraction of metallic and nonmetallic solid materials from the earth by mining, quarrying, or other means; extraction from sea water; geophysical prospecting for location of ore-bearing bodies

**NUCLEONICS**—everything related to research into atomic energy and its utilization

**PACKAGING**—batching, weighing, measuring, filling containers, wrapping, labeling, inspection of the packaged output, and all other operations associated with preparation of finished products for sale

**PAPER & PRINTING**—papermaking and all forms of printing on paper and on other materials, and control of machinery used

**PETROLEUM**—geophysical prospecting for oil and natural gas, drilling and operating wells, refining and production of petroleum products, and transportation and distribution of petroleum products by pipe lines, vehicles, and other means

**PLASTICS**—production, processing, molding, and fabrication of all types

**RAIL TRANSPORTATION**—operation and maintenance of all equipment running on rails, including railroad communication

**RUBBER**—production of both natural and synthetic types, processing, and conversion to finished products

**TEXTILE**—production of threads, fabrics, ribbons, etc.; manufacture of wearing apparel and other textile products

**UTILITIES**—operation and maintenance of electric power systems, gas systems, waterworks, and sewage disposal plants

**WOODWORKING**—conversion of standing trees to dressed lumber, processing of lumber, and production of all kinds of products and structures made from lumber

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- Used Now
- Potential Future Use
Radio

FREQUENCY

vs

UTILITY

By EDMUND A. LAPORT

Chief Engineer
RCA International Div.
Radio Corp. of America

New York, N.Y.

GROUND-WAVE PROPAGATION
refers to a wave which is
guided along the surface of
the earth, accompanied by
conduction currents in the
earth beneath

SKY-WAVE PROPAGATION
refers to a wave which is
radiated upward into space
above the earth and is re-
fracted or reflected back
to earth by the ionosphere

OPTICAL PROPAGATION
refers to a wave which is
transmitted between two
points within optical (or
radio-optical) line of sight,
consisting of a direct ray be-
tween transmitting and re-
ceiving points and one re-
flected from the intervening
earth, the received signal
being the vector sum of these
rays

DIFFRACTION BEYOND THE
OPTICAL
line of sight occurs in a re-
region corresponding to partial
shadow. In this region the
signal gradually vanishes as
distance beyond the horizon
increases

THIS CHART shows the relative
utility of the four useful
types of wave propagation for the
present-day radio spectrum. By
using utility as ordinate, it is
possible to indicate the relative
service value of the different prop-
agation means. Zero utility means
that the particular method of
propagation is useless. Maximum
utility means that the method of
propagation is the best available
for practical operation of a radio
service. The intermediate values
of utility indicate various degrees
of service utility, from marginal
to good. Utility varies with fre-
quency, for all types of propaga-
tion, and also with many empirical
conditions for each particular ap-
lication. Thus the limits of the
curves and their slopes are some-
what arbitrary.

The curves indicate utility. They do not in any way indicate
the relative efficiency of propaga-
tion as between the various types
of propagation. In the case of
sky-wave transmission, the propa-
gation efficiency is maximum as
propagation approaches the crit-
ical frequency beyond which its
utility would fall to zero over a
given circuit on a given day and
hour. The efficiency of propaga-
tion by diffraction beyond the hori-
zon might be very low at some fre-
quency but, if diffraction is the
only way in which a signal can
be propagated to the point and a
serviceable signal can be delivered,
the method must be regarded as
of maximum or high utility.
Within line-of-sight, frequencies
which are too high to be propagated
by sky-wave may be still too low
to provide efficient optical propaga-
tion for available heights, yet the
optical method may be the only
useful one and its utility must be
considered high.

Strangely enough, there is not
great overlap of the various types
of propagation, so that each is
dominant in utility within various
frequency ranges. The greatest
overlap is between ground-wave
and sky-wave propagation. In the
European low-frequency broadcast
band between 150 and 400 kc, sky-
wave transmission at night pro-
vides a substantial increase in cov-
erage over daytime ground-wave
propagation. In the same fre-
quency range, for navigational and
direction-finding facilities, this
overlap is detrimental and unde-
sirable. At the medium and low
frequencies, sky-wave transmis-
sion efficiency is generally low and
varies over a very great range,
night to night. However, since
there is considerable service value
in sky-wave coverage of medium-
frequency broadcast stations,
it must be rated as having utility.

There are other types of wave
propagation but these are not
shown because their utility is ques-
tionable and one would not be able,
at least from known conditions,
to base a reliable radio service on
their use. The chart shows the
wave polarization which provides
best utilization of each propaga-
tion medium at each frequency.
RADIO PROPAGATION - UTILITY CHART

- VLF
- LF
- MF
- HF
- VHF
- UHF
- SHF

PROPAGATION BY DIFFRACTION BEYOND HORIZON

OPTICAL PROPAGATION

SKY-WAVE PROPAGATION

GROUND-WAVE PROPAGATION

VERTICAL POLARIZATION
HORIZONTAL POLARIZATION
HORIZONTAL OR VERTICAL POLARIZATION
The following glossary is an attempt to identify and preserve a few of the more colorful and more or less familiar terms, some of whose origins are already vague and indefinite. Army, Navy, Air Force, the editorial department of ELECTRONICS, and other sources were used in collecting this information; the compiler, however, wants to acknowledge particularly the help of the Library, Evans Signal Laboratory.

In general, unpronounceable terms coined from initial letters of words are all caps; pronounceable words of this type have only the first letter capitalized, with a few exceptions like radar, loran, and sonar that have attained sufficiently widespread general use to be all lower case. Truly descriptive technical terms like plumbing, radar, and responder beacon are not capitalized. Code and foreign words and proper names having no technical significance are capitalized.

A / S AntiSubmarine. 
AC AntiClutter. 
ACE Altimeter Control Equipment. 
ADE Audible Doppler Enhancer. 
ADP Ammonium Dihydrogen Phosphate, a piezoelectric material. 
AEW Airborne Early Warning radar. 
AGL Airborne Gun Laying radar. 
AGS Airborne Radar Gunsight. 
AIC Airborne Interception (or Interceptor), an airborne radar for locating other aircraft. 
AIR Airborne Interception of Aircraft. 
AIL Airborne Instruments Laboratory, Mineola, N. Y. 
AJ AntiJamming; equipment or procedures for defense against enemy jamming. 
ALSOS Intelligence mission to Germany. 
AMTI Airborne Moving Target Indicator. 
Angel Corner reflector suspended from a free small balloon or flown on small captive balloon or kite to simulate radar targets and deceive enemy radar sets. 
Areac Aids to Navigation Radio Control. 
Antidiver SCR-584 used against buzz bombs. 
ARA Airborne Radar Attachment. 
ARL Aircraft Radio Laboratory, Wright Field, Dayton, Ohio. 
ARO Airborne Range Only; light-weight fire control radar for installation in aircraft turbines; provides gunner with range of attacking aircraft. 
ARSB Anchored Radio Sonobuoy. 
ART Automatic Range Tracking. 
Asdic AntiSubmarine Detection Investigating Committee; British for sonar. 
Aspex Aspen with Pepperbox in- 
Aid to Navigation Radio Control. 
Antidiver SCR-584 used against buzz bombs. 
ARA Airborne Radar Attachment. 
ARL Aircraft Radio Laboratory, Wright Field, Dayton, Ohio. 
ARO Airborne Range Only; light-weight fire control radar for installation in aircraft turbines; provides gunner with range of attacking aircraft. 
ARSB Anchored Radio Sonobuoy. 
ART Automatic Range Tracking. 
Asdic AntiSubmarine Detection Investigating Committee; British for sonar. 
Aspex American S-band Oboe using British PENwiper airborne receiver; a line-of-sight blind bombing system that utilizes two ground stations and airborne equipment. Range of the aircraft is determined simultaneously by the two ground stations using airborne transmitter to augment the signals. One station obtains range and the other the bomb release point. 
Aspex A Oboe using Pepperbox instead of Penwiper receiver. 
Aspex Countermeasure for German Knickebein (Headache). 
ASV Air-to-Surface Vessel; airborne radar for detecting objects on the surface of the sea. 
ASVC Canadian ASV. 
ASW AntiSubmarine Warfare. 
AT lorans Air-Transportable lorans. 
ATR AntiTR, a TR box for utilizing the same antenna for transmitting and receiving in microwave radar. 
ATW Aircraft TailWarning; radar installed in the tail of aircraft to warn of approaching aircraft. 
AW Aircraft Warning. 
Azon Azimuth ONLY; radio-controlled missile. By means of radio transmitter in the dropping aircraft, the bomb can be moved in azimuth (see Razor). 
Babs Blind Approach Beacon System; pulse-type ground navigation beacon used for runway approach at airfields. 
Bagpipe Jammer which sounds like its name. 
Balan Bazooka, a unit between a co-axial (unbalanced) and an open or balanced transmission line. 
BBL Beacons and Blind Landing. 
BDI Bearing Deviation Indicator for sonar. 
Beacon Interrogated radar for position fixing. 
Beagle Automatic search jammer. 
Beaver Ground-based radar jamming system used against German early warning radar. 
Beavertail Ground-based air-transportable radar for height-finding. Also radar antenna beam, wide in the horizontal but flat in the vertical plane. It is swept up and down for height-finding. 
Bedspring Broadside array with flat reflector. 
Beechnut Ground to air communication system. 
Benito Ground control of range and azimuth of an aircraft (German). 
Bernhard German navigation system for intercepting night bombers. 
Bernhardine Bernhard. 
BGS Beacon, Ground, S-band. A fixed ground radar navigational beacon. 
Billboard Broadside array with flat reflector. 
Birdnest Cluster of chaff. 
Blip British term for pip; a deflection or break in a c-r tube display, caused by a radar echo, produced as a range marker, or for calibrating a range scale. 
Blister A streamlined housing on an aircraft for a radar antenna (scanner or dish); official name is radome. 
Block General term for television equipment, (includes camera, transmitter, and receiver) used with guided missiles. 
Boffin Civilian technical consultant attached to a military unit. 
Boiler A guided missile.

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and Their Meanings

By CHARLES DeVORE

Signal Corps Publications Agency
Fort Monmouth, New Jersey

Bolingbroke Attack plane for experimental radial.
Bo Peep A low-altitude bombing attachment for ASV.
Box Cars Long pulses separated by very short intervals.
BPP Beacon, Portable, Packset.
BPS Portable beacon.
BRLG Beacon, Radio, Longitudinal, Generator-powered; a radio Doppler-reflection fuze for bombs to burst a predetermined distance from the ground.
Broodloom Airborne tunable magnetron jammer, similar to Carpet.
Broom Search jammer, automatic.
BRS-Radar marker float.
BRLG Bomb, Portable, Packset.
BPP Beacon, Portable, Packset.

BTO Bombing Through Overcast

CCB Close Control Bombing

CD Coast Defense radar for detecting surface vessels (British).
CD/CHL Coast Defense radar set using CHL type equipment (British).
CDU Coastal Defense radar for detecting U-boats (British).
CH Chain Home; British fixed-station, long range aircraft warning radar, operating in the 30-mc band.
Chaff American version of British Window; name suggested by shape of material, long thin strips (torpedo jamming).
Charlie A lightweight radar for warning and fire control against surface craft.
CHB Chain Home Beamed; a small CH with 25-ft towers for inaccessible locations.
CHEL Chain Home Extra Low; British 10-cm radar for detecting low-flying aircraft.
CHL Chain Home Low; British radar for detecting low-flying aircraft; operates in 200-mc band.
CIC Combat Information Center; "combined communication board" of Navy.

clamp Circuit to hold base line of a waveform or pulse to a given potential or current value.
clotter Undesired indications on a cathode-ray tube caused by fixed echoes, enemy or friendly transmissions, abnormal atmospheric conditions, etc.
CMH CenMeter Height finder; ground radar set to determine height or altitude only, of aircraft.
CNT Celestial Navigation Trainer.
CO Chain Overseas; CH stations for installation outside of Great Britain.
cobs Bell-shaped deflections produced on a cathode-ray tube by f-m jamming.
COL Chain Overseas Low; CHL station for installation outside of Great Britain.
Confuser Mechanical noise generator.
Consol British code word for Sonne.
COP NDR Committee On Propagation.
Cousin Maud AI station homing beacons.
Corkcrew Another name for Fanny.
corner reflector Metallic reflector specially constructed to give strong radar reflections nearly independent of azimuth. Used for calibration and for navigation.
Crown of Thorns Type of magnetron.
Curtain Type of vhf homing equipment.
Cynthia Code name for Signal Corps project for communication by reflecting radio signals from the moon.
Daisy Mae Australian height finder.
DCG Doppler-Controlled Gain.
dead time Period after reception of a signal during which a beacon cannot be triggered.
Decca British radio navigation system using continuous waves rather than pulses.
Decoder Device for deciphering coded signals.
Derex Earlier term used for radar.
df-Direction finding; determination of azimuth.
Diana Code name for Signal Corps project for securing radar echoes from the moon.
Dina Df-Noise Amplifier; a noise-modulated radar jammer.
Dinamate A monitor receiver for low-frequency doppler.
diplexer System to allow radar and a communication transmitter to use same antenna.
dish A shallow paraboloidal reflector for microwave use. Corresponding British term is mirror.
Djakus German radar navigation and bombing system.
DMH DeciMeter Height finder; ground radar similar to CMH, except for frequencies employed.
Dodor Determination Of Direction And Range by supersonic waves. (Similar to Sodor.)

Dog Ground beacon; looking for the dog means that the radar operator in an aircraft turns on his AI to home on a ground beacon.
Dolphin Torpedo fire control.
door knob R-f coupling device; also an early high-frequency tube.
Dora German rotating figure-eight radio beacon.
drift station Shoran parlane for Cat beacon.
drone Radio-controlled aircraft or waterborne craft.
Duckegg A transmitter for repeating the position of an aircraft, obtained by Gee, back to a slip, shore station, or another aircraft.
duct Troposphere waveguide-like formation accounting for abnormal uhf and shf transmission.
Dueppel-Streifen German term for window.
Dumbo SV radar.
duplexer Combination of TR switch and transmission line.
duplexing Use of single antenna for transmission and reception on a radio system, the requisite switching operation being performed automatically by other than mechanical means.
Eagle High-resolution 3-cm airborne radar bombights.
EAr Electronic Aural Responder.
EAS Electronic Automatic Switch.
EDI Echo Doppler Indicator.
echo box High-Q cavity for echoing a received pulse.
Edward British radio-controlled tank.
Egon Ruebezahl.
Electra German navigation system using radio beacons.
Elephant Shipborne jammer.
Elmer Communications net deceiver.
Elodie SIC; searchlight-control radar.
Emil-Emil German code name for AI.
Emma Airborne automatic mountain warning device. Gives notice of proximity to high terrain. Also called Mountain Goat.
Eniac Electronic Numerical Integrator And Computer.
Enzian German supersonic radio-controlled missile.
Erika Beacons similar to Knickebein.
ERSB Expensive Radio Sono Buoy.
ESMTW Engineering Science Management War Training program.
Ether Scanner A panoramic search receiver with c-r tube presentation.
Eureka Pulse-type ground responder homing beacon for aircraft equipped with Rebecca interrogator. Especially useful for landing troops in invasion areas.
EW Early Warning (radar).
Expendable Same as Lewisite.
Falco AN/APG-13 range-only fire-control radar.
Fanny Attachment for airborne search receivers to permit homing on jamming or radar signals.
Father Blind approach beacon.
WARTIME WORDS (Continued)

FAW Forward Area Warning.

Felix Guided missile, using standard 1,000 or 2,000 lb bomb covered by streamlined case containing heat-seeking equipment in the nose and rudders and elevators with control mechanism on the tail. Intended for use against targets giving off heat, such as coke ovens, steel mills, etc.

Fence Equipment developed for aircraft detection over mountainous terrain, using Doppler effect.

Firefly Moving vehicle indicator.

Fishing Fleet A fleet of boats carrying radar, operated off shore for early warning.

Fishline Tinsel rope.

Fishpond Use of H2S as a warning of the approach of enemy aircraft.

fix A determination of location.

Flasher Corner reflector.

flip-flop Slang for circuit similar to multivibrator.

Florence A device of window against German radar.

Flute Low-power tunable c-w magnetron.

Fox A 40-cm radar beacon system for following drones from shipboard or shore-based radar sites.

Freya German early-warning radar.

Flitz German version of Razon.

Fruit Equipment used for triggering responders, thus expanding the range of radar detection.

Fritz German early warning radar.

Fuge German intercept receiver.

GAA Ground Anti Aircraft control (also GL) gyratory British term for radar antenna array.

gap Space between radiation lobes of a radar antenna where the field strength is low, resulting in incomplete radar coverage.

gap filler An auxiliary radar antenna used to cover gaps in the main radar antenna pattern.

Gardening Laying mines from aircraft.

Garb Ground Approach Radio Fuze (same as BRTG).

Gargoyle A 1,000-lb armor-piercing glide bomb, controlled by radar from the launching place and containing a target-seeking device.

Gaston U. S. development of tinsel, a modulator for airborne communications jammers.

GB Glide Bomb.

GCA Ground Controlled Approach. Radar used to track friendly aircraft and direct them by voice radio into a position for making a safe landing. A talkdown system.

GCI Ground Controlled Interception. Radar system of means of which a controller at the radar may direct a fighter plane to make an interception of enemy aircraft.

GCL Ground Control Landing (for aircraft: GCA).

Gee British hyperbolic pulse navigation system, 40 to 90 mc, differing from loran only in frequency employed.

Gee H Combination of Gee and H navigation systems.

George An antijamming device for radar receivers, using low-level blanking.

Germonica German version of Monica, airborne tail warning radar.

GPCS GunFire Control System.

Girl Friend Searchlight control apparatus.

GL Gun Laying radar equipment used to direct gunfire; supplies range, bearing, and a抬升data.

Glom 4,000-lb. Navy Glide bomb with television control.

GMCM Guided Missile Counter-Measure.

Goldmark Recording search-receiver, 90 to 1,000 mc.

Goldammer Stenuel B.

Goron Navy air-to-air rocket controlled by radio and fitted with target-seeking device.

GPI Ground Position Indicator; ground position is determined by adding ground speed and drift readings to air position data.

GPL Gee Path Landing system.

GPR General Purpose Radar.

Grass Chatter.

Greenbottle Device for homing on U-boat radar.

Grocer Ground-based jammer for German AI radar on 480 mc.

GS General Search (radar) from the ground.

GSV Ground-to-Surface Vessel search (radar).

guillotine Attenuator.

Gulls Bar- supported radar reflectors to simulate targets similar to Angles and Kites.

Gutteral An airborne jammer hunter using a modified AI receiver.

Gymnast Project name for radar search and analysis expeditions.

H British pulse-type air navigation system using an airborne interrogator and two ground responder beacons, the range to each being measured accurately to about ¼ mile. Gyms is the principle as Rebecca-Eureka and shoran.

Halsted system Scheme for low-frequency secure radio communication between control tower and aircraft on the ground at an airport, using buried cables for radiating elements.

hash Grass; continuous electrical noise; usually refers to disturbance on a scope.

Haytinker Schnorkel detector.

Hayrack Jr. Radar beacon and homing device.

Headache British name for Knickebein, a German radio beam navigation system (see Antipin).

Hen Expendable broadcast transmitter.

Hepcat Unit permitting the display of jitterbug pulses on a servoscopic screen in such a manner that the maximum and minimum pulse intervals can be measured. hcf 3 to 100 meters.

HDFD High-Frequency Direction Finding; Huff-Duff.

Hicouche Circuit which elevates a time base to a desired time.

Hoardings Mammut.

Hodge-podge A jamming transmitter, 85-105 mc.

HPG High Power Ground (radar); 10-cm radar height finding.

HR Hand Radar; extremely portable radar set.

H2S Home Sweet Home; 10-cm airborne navigational and blind bombing radar set; British predecessor of American H2X.

H2X American version of H2S; similar except it operates in X-band.

Huff-Duff High-frequency direction finding.

HUSL Harvard Underwater Sound Laboratory.

Hyperbel German version of Gee.

hyperbolic Pulse-type navigation systems, in which two or more synchronized ground stations transmit pulses. An aircraft or ship receives the pulses and records the difference in time of arrival, which is a measure of the difference in distance from the two ground stations and determines its location on a particular hyperbolic curve. A similar reading is obtained from another pair of stations, or from the same master and a different slave station, will select a different hyperbolic curve, the intersection of which with the first curve will give the position or fix. Systems using this principle are the British Gee and the American loran.

ICH Intermediate Chain Home.

ICU Interception Control Unit (ground trainer).

iff Identification, Friend or Foe. System of pulse type interrogation and reply, generally used in connection with radar, for identifying aircraft.

IFL Induction Field Locator.

IJAJ Intentional Jitter, Antijamming. A random jittering of recurrence rate to prevent the enemy from locking jamming signals to our own radar.

IJU Intentional Jitter Jammer Unit. Jammer, designed to prevent the enemy from locking jamming signals to our own radar.

Inquisitor Airborne interrogator-responder for iff or beacon interrogation. Pulse-type transmitter used for triggering responders, thus causing them to transmit pulses in reply. The receiver for picking up the replies is called a responder or responder.

IR Interrogator-Responder (or responder), an interrogator and responder built in a single unit.

iris Any flat piece of metal applied across the plane section of a waveguide.

IRRAD Infra Red Range And Direction detection equipment.

IRT Interrogator-Responder-Transponder, a combined unit capable of acting as interrogator-responder and as transponder.

IU Interference Unit; a small synthetic noise generator to increase the noise of other transmitters.

Jackal Airborne barrage jammer against enemy radio communications. Jamming Transmission of interfering
radio or radar signals with the object of directing the use of enemy equipment impossible or greatly decreasing its effectiveness.

**Jhayut System** An air-to-ground navigation system.

**JBBL** Jamming Beacons and Blind Landing.

**Jellyfish** A seaborne responder beacon in the form of a buoy, to be laid from aircraft or boats. Used as a marker in antisubmarine patrol and for general navigation.

**Jiggs** Shore bombardment beacon.

**JK** Navy designation for crystal liser.

**KDP** Potassium Dihydrogen Phosphate.

**K-band**

**Jukebox** An airborne automatic selection system.

**Jitterbug**

**Lady Searchlight control apparatus.**

**Knickebein** German long-range Loron疫情防控.

**King Class** A remote radio control system.

**1-f Loron** Low-frequency loron.

**Little Abner Light-weight pack radar, lobe switching**

**Little Screw** Ground radio installation used to control fighter aircraft from a GCI.

**Little Joe** Proximity fuze bomb controlled by radio from launching position.

**Little Screw** Ground radio installation used to control fighter aircraft from a GCI.

**lobe switching** Process in which the direction of the beam of an antenna is shifted slightly to the left and to the right of the dead-ahead position, and the received signal strengths compared. The entire antenna can then be turned until equal signals are received from both lobes, thereby accurately measuring the azimuth of the target without an impractically narrow beam width. This process is used in many ground and shipboard navigational radars, and in the low-frequency airborne radars and beacons of IFF interrogators.

**Lobster** An airborne device for homing on enemy jamming or radar transmissions.

**Lobster Tail** Lobster.

**Loran** Long Range Navigation System, simply the principle to the British Gee, but operating on 1,950 kc.

**Lorelei** A decoy which simulates a shipboard radar in search.

**LRASV** Low Range ASV radar.

**LRN** Loron.

**Lucero** British interrogator-responder used for both IFF and Eureka-Beacon.

**LW** Light Warning, a small portable British early warning radar for use on beaches and at advance air bases.

**Leopard Type of Jammer**

**LWASV** Low Weight ASV radar.

**MABS** Magnetic Approach Bomb release.

**Maccaboy** A jammer hunter similar to Gull but designed for installation in Mosquito aircraft.

**MAD** Magnetic Airborne Detector; coils mounted in an aircraft for detecting changes in the earth's magnetic field caused by the presence of a submarine.

**Madame X** Proximity fuze radar.

**Magie** Adoption of SLC for fire control. Also slang for magnetron.

**Magic** Tee Directional waveguide coupler.

**Maip Bung** Large signal on a scope caused by the transmitted pulse.

**Mammot** German early warning radar.

**Mandrel** Airborne barrage jammer against enemy early warning radar; uses noise modulation.

**Margery** Mobile searchlight control set used to determine favorable locations.

**Maroo Jammer** For enemy naval radio communications.

**MARS** Military Airborne Radar Systems.

**Mary** An antijamming device for radar receivers, using high-level blanking.

**Mate** Receiver attachment for tuning Dina.

**Mattress** Vertical half-wave dipoles arranged in horizontal rows with the rows one above the other. A flat sheet-metal reflector behind the array prevents back radiation. Also known as Bedspring and Billboard.

**MDS** Minimum Detectable Signal.

**Meandering** Synchronized tracking transmitter and receiver.

**Measles**

**M.E.W** Microwave Early Warning. A high-power, long range, 10-cm early warning radar with a number of indicators, giving high resolution and large rail-handling capacity.

**M-ff** 0.3 mc to 3.0 mc; 1,000 to 100 meters.

**MPDF** Medium Frequency Direction Finder.

**M.H.F** Microwave Height Finder. Same as HPF.

**Mickey Another name for H2X.**

**Mickey Mouse** SCR-547, a 10-cm radar-on-the-radar, for antiaircraft gunnery. Distinguishing feature of set was two scanners extending horizontally from a main vertical.

**Micro-H** Precision radar beacon navigation and bomber system.

**Microflash** High intensity short-duration light source for photography.

**Milky** Sniperscope.

**Mimo** Miniature Image Orthicon.

**Mirror** British term for dish.

**Moff** Snooperoscope.

**Monica** Airborne tail warning radar to warn off approach of other aircraft, especially night fighters.

**Monoray locator** Determines range to enemy guns by recording time between flash and sound.

**Moth** A bomb which will home on and destroy enemy radar stations.

**Mother A-1 station, home device.**

**Mountain Goat** Same as Emma.

**Mouse** Ground O'joe station which gives the signal for bomb release.

**M WD** Mobile Radar Warning Device, a mobile version of the British CH radar.

**MTB** Maintenance of True Bearing in echo ranging.

**Musa** Multiple Unit Steerable Antenna.

**Muff** A guided missile.

**Mush** Noise level on time base of c-r tube.

**NAB** Navigational Aid to Bombing; another name for H2X.

**NALOC** Naval Aids to Landing Operations Committee.

**NDRC** National Defense Research Committee.

**NEL** Navy Electronics Laboratory.

**Nickelodeon** A panoramic set used to determine favorable locations.

**NOL** Naval Ordnance Laboratory.

**NRN** Naval Research Laboratory.

**Nachtfeher** German system for communicating with fighter aircraft over radar signals.

**Nancy** Infrared signalling device.

**Narav** Aircraft traffic control using radar.

**Neutrode** Type of magnetron.

**Oboe** British ground-controlled system for blind bombing, similar to Aspen. One ground station (the Cat) interrogates a high-power transponder (Peacock) in the aircraft and codes its transmissions so that the aircraft can steer a course at constant range from the Cat along a circle which will intersect the target. The other ground station (Mouse) takes continuous range measurements on the Peacock and gives the signal for release at the proper time. Accuracy is of the order of 100 yards at 200 miles.

**Octopus** 10-cm r-f assembly.

**Oscillatfe Traffic** German broadcast of aircraft warning radar plots.

**Opposition** An airborne jammer hunter, 100-124 mc.

**Orange Squeaker** Jamming operation carried out against a particular U.S. air defense system.

**Oscur** A small jammer, 60-240 mc, used for AJ training.

**OSRD** Office of Scientific Research and Development.
**WARTIME WORDS (Continued)**

Otto Airborne self-recording radar intercept receiver, 80-1,000 mc.

Pentico 93-98 cm, used against Japanese walkie-talkies.

Panasonic A television aDapter for search receivers.

Panoramic A type of search reception in which the received signals are displayed on a c-r tube at different positions, according to their frequencies. Thus a panorama of all signals within the frequency sweep of the receiver is obtained.

PDB Radio-controlled, Power-Driven Bomb.

PD Pilots' Direction Indicator.

PE Permanent Echo (from stationary object, such as mountain, building, etc.) on c-r tube.

Peacock High-power airborne transponder in Oboe.

Pelican Guided projectile.

Penwiper A 10-cm receiver used in the Peacock of Oboe.

Penliner An improved Penwiper.

Perfecto Airborne radar to trigger German IFF.

Peter Pan Radar jammer.

PF Proximity Fuze.

PFM Pulsed Frequency Modulation.

PGP Pulsed Glide-Path landing system.

PI Pilot Indicator (for AI).

pillbox Parallel-plate transmission line.

Pimpernel Jammer with monitoring receiver to enable continuous adjustment to enemy radar frequency for jamming.

ping Pulse signal from echo-ranging sonar apparatus.

Ping Pong British d-f set for locating enemy radars.

pip Radar echo on c-r tube (same as British Bilp).

Pip-squeak Clock-operated mechanism for airborne vhf transmitters. Clock turns the transmitter on for 15 seconds out of every minute, enabling the ground direction-finding stations to locate the position of friendly fighters once every minute and thus direct the aircraft.

PIU Pilot Indicator Unit.

plumbing R-f line.

poop Slant for pulse.

Polyrod Polystyrene antenna.

Pop Post Office Position Indicator; British radio navigation method depending on phase measurements.

Porcupine B-29 with jammer equipment.

Pork Chop Attenuator.

ppi Plan Position Indicator, a c-r tube presenting a complete 360-degree picture of the surrounding area, obtainable by continuously rotating the antenna.

PPPI or P1 Prevision Plan Position Indicator, an expanded segment of the PPPI display shown on B scope. Also projection ppi, similar to British Skiatron.

Prep U. S. Navy time-modulated pulse communication system.

presentation Form in which radar signals appear on c-r tube.

Pretty Method of interception.

PRF Pulse Recurrence Frequency.

proximity fuze Fuze set off by the capacitance effect between shell and plane.

Pterodactyl Automatic Vulture.

pulse Doppler A scheme for detecting moving objects by pulse methods in the presence of ground clutter.

pulse power Peak power output of a pulse transmitter in kw.

Pup A low-power barrage jammer against enemy radio communications.

PWM Pulse Width Modulation.

QB Echo-ranging sonar using Rochelle salt transducers.

QC Echo-ranging sonar using magnetostriiction transducer.

RAA Radar Aircraft Altitude calculator.

Rabbit A target.

racon Term including both RAdar beacons and responder beacons.

radio RAdio Direction And Ranging. Pulse type transceivers for detecting and tracking aircraft and ships and for air navigation.

radar beacon Transponder which receives pulses from airborne or shipborne radars and transmits suitably coded pulses in reply. Range and azimuth of the beacon are measured at the radar by the same way as normal echoes, except that the beacon usually replies on a different frequency, requiring the radar receiver to be detuned for beacon reception.

radome Official term for radar blaster or antenna housing.

Railing Pulse jamming at high recurrence rate that affects on a c-r tube resembles fence railings.

Raspberry A jammer modulator generating a 1,000-cycle tone, modulated at about 50 pulses per second.

Raven General term for airborne RCM.

rawin RAdio WInd flight; radiosonde.

rate station Shoran parlance for Mouse beacon.

Raydist—A lightweight c-w phase comparison system, similar to Decca, suitable for surveying and propagation studies.

Razon Radio-controlled missile similar to Azon, but controllable both in range and azimuth.

RCM Radio CounterMeasures; a term covering all actions against enemy radio and radar, and the equipment used for this purpose. This includes deliberate interference (jamming), the interception and analysis of enemy signals, and a wide variety of deceptive measures.

RCM Radio Controlled Mines.

RDF British equivalent of Radar. In America, while the letters signify Radio Direction Finder, the term has no connection with radar.

Rebecca The airborne interrogator-responder of Rebecca-Eureka, a responder which is shadowing enemy radar for the purpose of dropping paratroops or supplies. Range to the beacon can be measured directly, allowing the aircraft to arrive on an accurate time schedule and to drop supplies within 100 yards of the beacon.

Reichslicht German rocket with proximity fuze, autopilot, and radio control.

relay radar Transmission of radar display from air to ground via radar beacon.

responder beacon A receiver-transmitter used to receive pulses from a beacon interrogator and to transmit appropriately coded pulses in reply.

responder The receiver used with an interrogator to receive the replies from transponders.

Rex A pulse control system for guided missiles.

RGL Radar Gun-Laying.

RGP RAdar Glider Positioning system.

RHB Radar Homing Bomb, a missile designed to home on and destroy an enemy naval target which has been illuminated by ground radar.

RGP RAdar Glide-Positioning system.

RHI Range-Height Indicator.

Rhubarb The operation of jamming German coast-watching radar on 380 mc.

Rising Sun Type of magnetron.

RLBI Right-Left Bearing Indicator.

RLS Rotating Lighthouse System for radio navigation.

RPM Range Only radar.

Road Drill A form of rafter jamming signal, so-named because of the sound of the modulation.

Rock A Navy radio-guided, television-controlled missile. Also called Dragon.

roller fading Type of signal variability.

Rope 40-ft long metallic ribbon for jamming.

Rooster An airborne transponder used to enable an airborne strike force equipped with radar with special interrogators to home on a patrol aircraft which is shadowing enemy navy patrol forces.

Rosebud Airborne range coded beacon.

Rosie Slang for MEW station.

RRL Radio Research Laboratory.

RLQ Rocket, Radio, Longitudinal, Generator-powered; similar to BRLG, but for use with rocket projectiles.

RKP Radio Ripple Proximity; a fuse fired by radio reflections from the target.

Ruebezahl German bomber-control navigation system. Also called Egon.

Rufmann German radio blind bombing scheme using multiple beams. See Bromide.

Ruhfeld German 700-mph missile controlled by wire from mother airplane.

Rug An airborne barrage jammer for use against enemy radar in the 200-250-mc band.

Rug Practice Jammer Practice jammer for Navy low-frequency radar.
Running Rabbits: Unlocked cobs interfere on a c-r tube, caused by l-m jamming.

Sanborn: A bench for AI (SCR-520) radar.

sand: S-band Attenuator for coaxial line or waveguide. Uses sand.

Sanita: Search light system.

Sandy: An airborne receiver and selective jammer for use against enemy communications in 14-50 mc.

Saxophone: Vertex-fed linear array antenna.

SBA: Standard Beam Approach; a British radio blind approach system using Lorenz beams and marker beacons.

SBB: Shore Bombardment Beacon.

scanner: Spurious echoes due to reflections from ionized layers of the upper atmosphere.

Scent Spray: H2S for landing craft (clue: Scent spray)

Schmutterling: German rocket controlled by radio or radar.

Schwanboje: German floating target beacon.

Schwarzschild: High-speed scanning antenna used with MPG-1 radar.

Sod: Controlled Interception; similar to GCI but installed on aircraft carriers.

scope: An oscilloscope or cathode-ray tube.

sea return: Clutter on an airborne radar c-r tube due to sea reflection.

searchlighting: Directing a radar beam steadily on a target, either manually or automatically.

Sectakt: German ground radar coast-watcher.

selective: A type of jamming in which a single channel only is jammed. See barrage.

shf: 3000 to 30,000 mc; 0.1 to 0.01 meter.

shoran SHort Range Navigation aid; similar to loran. An H navigation system with sufficient accuracy (high frequency for operation) for blind bombing.

Serrate: Airborne homing equipment for use against enemy AI radar.

silver bullet: Silver-plated bunt.

Skatton: Dark trace projection ppi.

skip keying: Reduction of radar prf to a submultiple of that normally used, to reduce mutual interference between radars or to increase the length of the c-r tube time base.

slave: One of the ground stations of Gee or loran, which transmits only when triggered by a master.

SLC: Search Light Control; a type of ground radar for aiming searchlights.

slice: Triode amplifier.

Sniffer: Radar for automatic bomb release.

Sniper-scope: Infrared image translator.

Sniper: An i-f interrogator-responsor mounted in a vehicle, for use at an airport in checking the operation of i-f transponders in aircraft as they take off.

Snipperscope: Sniperscope.

Snow: Noise on a ppi or B scope.

Snowflake: A rocket used to project packets of Window up to several thousand.

SOD: Small Object Detector.

Sodar: Acoustic (Sound) radar (Bell Labs project).

SOSR: Sound Finding And Ranging (U.S. Navy).

Sonde: Sound Navigation And Ranging. General designation for under-water sound devices for listening, echo ranging, and locating obstacles.

Sonnie: German navigation system.

Space Hat: Lossy cavity used in testing.

Spaniel: A rocket projectile, radio-controlled, fired from a fighter aircraft.

spike: Leakage pulse from t-r tube.

spinner: A rotating antenna and reflector for microwave radars; includes missiles, motors, etc. Also called scanner.

split: British term for lobe switching.

split-can antenna: Antenna consisting of a cylinder split lengthwise along one side.

Squeeze: Slotted sections in wave guides arranged in such a way that width of the guide is compressed to vary velocity of wave and hence apparent length of section.

squeegee: Oscillator in which start and termination of oscillations are determined by the constants of the grid circuit. English term.

SRE: Send-Receiver-Bomb; a radar homing bomb which includes its own radar for illuminating the target.

SS: General Search from Ships.

SLoran: Sky-wave Synchronization loran.

SSV: Ship-to-Surface vessel.

stack: Sonar chassis assembly in sound room.

Stalo: STABLe Local Oscillator.

Stendal: B German anti-jammer.

Stinky: Another name for H2S. Clue: H-S is symbol for hydrogen sulfide.

SubSig: Submarine Signal Co.

SWR: Standing Wave Ratio.

SWVR: Standing-Wave Voltage Ratio.

Tail: Homing receiver attachment.

tall: Small pulse following main pulse and in opposite direction.

TBS: Talk-Between-Ship communication system.

TCG: Time Controlled. Gain.

TCL: Terrain Clearance Indicator; an absolute altimeter.

TDI: Target Doppler Indicator.

Tea: Shipborne jammer for use against radar sweeps.

Telen: TELEvision and RAdar Navigation system.

Terry: Automatic air-to-ground ranging radar system.

TGI: Tail Gunner Indication.

Tinsel: An airborne radio communications transmitter, used for jamming operations.

Tinsel rope: Tuned rope made for Tinsel.

Tramlines: A form of jamming; c-w modulated with a low-frequency waveform.

transponder: A receiver-transmitter which responds to received coded pulses by sending coded pulses in reply.

t-r box Transmit-Receive box; a device for utilizing the same antenna for radar transmitting and receiving.

TRE: Telecommunications Research Establishment (England).

trigatron: Enclosed triggered spark-gap radar pulse modulator tube.

trigger: To cause a transponder to transmit pulses.

trombone: Line stretcher.

TRU: Transportable RAdio Unit;

Truie: Similar to Hyperbel.

Tuba: High-powered American German ground radar transmitter, 30-kw, non-coherently modulated, named for its huge parabolic antenna.

Tuft: Target identification beacon.

Turkey: An i-f set.

Tinsile: Jammers made of three half-wave dipoles connected to each other at centers.

TVL: Time Variations of Loss.

TW: Tail Warning; a light-weight airborne radar for warning of the approach of enemy aircraft from the rear.

twog: Classified material.

uhf: 300-3000 mc; 1-0.1 meter.

Uncle Blind Approach beacon.

Unified Radar Bomb Sight.

VDI: Visual Doppler Indicator.

vhf: 30-300 mc; 10-1 meters.

VHFDF: Very High Frequency Direction Finding Device.

VIP: Very Important Person.

Visar: Nosmo-Mark II.

Vixen: S-band attenuator.

VHF: 0.1-0.03 mc; 30,000-10,000 meters.

vodg: Voice Operated Gain Adjustment Device.

VSOS: Voltage-Sensitive Oscillator.

VTDC: Vacuum Tube Development Committee of NDRC.

Vulture: Automatic range finder. Overland Falcon.

Walter: A light-weight pulse transmitter for use in aircraft dinghies for aiding in sea-rescue by aircraft equipped with ASV.

Wassfall: German guided rocket.

Watson effect: Short, bright horizontal line descending from top of a strong echo.

Weary Willie: War- weary plane used as guided missile.

Whirling Derivish: Mortar location radar.

Willie: Orphan: Drone beacon.

Window: British designation for metalized or tinfoil strips thrown from aircraft to give misleading or distracting radar echoes (see Chaff).

Wolf: Light-weight receiver detonator to be carried by a dog. A device constructed of dummy munitions.

Wont: Device to prevent improper response in a decoder.

Wuerzburg: German fire control radar.

Wurzlaus: German anti-jammer.

Yagi: Type of antenna used on long-wave radar sets. Named for its designer, Professor Hidetsugi Yagi, of the Tohoku Imperial University, Sendai, Japan.

X-band: 3,200-11.000 mc; 577-273 cm.

Yado: Modified Oboe system.

Yehudi: Trigger used in beacon transmitter to tune beacon to proper frequency.

Zero Catcher: A wide-band airborne radar warning receiver.

Zyklop (Cyclop): Similar to Knickbein.
Handling and Maintenance of INDUSTRIAL

**RECEIPT**

Examine shipping container for visible damage before opening

Unpack tube and examine for loose or broken parts

Test large types electrically in special equipment, or in apparatus in which they are to be used

Use crane or dolly when lifting or moving exceptionally heavy types

**STORAGE**

Use oldest tubes first

Operate or test large types every three to six months

Store in original cartons if possible

Keep mercury-vapor and large power types in upright position

Protect against chemicals and fumes, water, and extreme or rapid temperature change

**FOOTNOTES**

(1) If damage in shipment is evident, sign carrier's receipt "accepted subject to hidden damages"

(2) If tubes have been damaged in shipment file claim with the carrier within time limit specified (usually 15 days) and notify supplier

(3) Cathode-ray, receiving, and small power tubes need not be periodically tested if they are placed in service within one year but should be tested before the manufacturer's warranty expires. Seasoning of large mercury-vapor rectifiers and high-vacuum power tubes is normally accomplished by operating them in the equipment in which they are to be used, starting with reduced plate voltage and finally operating them for one hour or more at full plate voltage and rated load.
CATHODE-RAY
Visual Indication, Measurement
Laboratory and production testing, indication and measurement of all kinds of transients...

PHOTO
Control, Measurement
Lighting controls, talking motion pictures, door openers, light and color measurements and comparisons, production inspections, counting and sorting...

GAS
Rectification, Control
Timers, motor speed control, welding control, battery charging, machine cycling...

ELECTRON TUBES

OPERATION
Read operating instructions
Start new tubes, or tubes which have been idle for several months, at reduced power
Measure power-line variations and adjust filament transformer tap so that rated filament voltage range is never exceeded
Be sure maximum ratings are not exceeded under load
Keep air-cooled tubes and radiator fins free of dust
Check water flow, temperature, and purity when water-cooled types are employed
Protect mercury-vapor types against extreme temperature variation
Apply filament voltage to new mercury-vapor tubes for at least 30 minutes before initial operation

RECORDS
Record power output of equipment at regular weekly or monthly intervals
Note gradual reduction of power output, indicating approach of end of tube life when other circuit conditions are normal
Note that decreased sensitivity of phototube or cathode-ray tube equipment may denote approach of end of tube life
Check for end of tube life by substituting tubes known to be good and comparing power output or sensitivity of equipment

CLAIMS
The supplier should be notified if tubes are initially defective for reasons other than damage in transit or fail within the warranty period in order that credit may be claimed within the warranty period
Service report forms should be carefully filled out since most manufacturers require this information
A return authorization should always be obtained before returning tubes
Returned tubes should be packed in the original or equivalent shipping containers.
MUCH NEW INFORMATION on plastics useful as h-f insulating materials has become available since the outbreak of the war. Some of the materials were unknown here before the war; new tests on others have disclosed hitherto unavailable data. Properties of those plastics which have power factors less than 0.001 at 1 mc are tabulated here and are briefly described.

Table I gives comparable data on physical, mechanical, thermal, electrical and chemical resistance properties at room temperatures or, in some cases, ranges of values are given.

Table II gives other pertinent data more concerned with economic factors, methods of working, and basic forms.

Except for engineers who are well versed in the plastics field, the final selection of a material should not be entirely based on the tables of data such as here presented for three reasons: (1) The A.S.T.M. tests presently used on plastics are often comparative and not absolute. (2) Test values will vary from laboratory to laboratory due to differences in testing equipment and personnel. (3) Variations are possible in the basic resin molecule size and structure. Such tables as these should be regarded as starting points for further investigation—and not used alone to make final choices.

**POLYSTYRENE** — Commercially available in the United States since 1937, it is only in the last several years that polystyrene has become widely popular. Its early difficulties of machining and surface cracking (“crazing”) resulting during and after working and in aging, caused either by residual volatiles or from physical strain effects have been largely overcome by improved methods of manufacturing both the extrusion and molding powders, and by the development of annealing methods. It is the “workhorse” of the nonrubbery h-f insulators.

Polystyrene’s electrical properties remain nearly constant over a wide range of frequencies, temperatures and humidities. Chemical resistance, low water absorption, optical clarity and dimensional stability are other outstanding properties. At the present time, it is the most available and lowest priced of the materials discussed in this article. Polystyrene molecules can be oriented. When the sheeting has been two-directionally oriented by stretching, a flexible, tough sheet is obtained with a tensile strength about twice that of unoriented sheeting. This material can be obtained in thicknesses from 0.001 to 0.020 inch and it is laminated under heat and pressure to give thicknesses from 0.020 to 0.094 inch. It is low in price and can be punched or sheared in the thinner gauges without difficulty. The oriented material retains the excellent electrical properties of the unoriented material.

**MODIFIED POLYSTYRENE** — The maximum use-temperature of polystyrene is usually considered to be about 175° F. Much work has been done to produce other materials which have equivalent or nearly equivalent electrical properties, but which can be used at higher temperatures. Addition of chlorinated diphenyl materials to polystyrene results in such a material, sold under the name of Styramic. This material can be used at temperatures...
Electrical, mechanical, and chemical properties of commercially available low-loss plastic insulation materials suitable for use in high-frequency circuits are tabulated for quick reference. Text explains significance of properties tabulated about 10 F higher than polystyrene. Along with its improved heat resistance, it is nonflammable and has excellent machining qualities.

**Modified Styrene Resin**—Marbon S-1 is a modified styrene resin used principally with synthetic rubbers to improve processing and certain mechanical properties such as hardness, stiffness, tear and abrasion resistance. It is used as insulation for telephone wires, submarine cables, ignition cables and underground cables. Its mechanical, electrical and chemical resistance properties should suggest other applications in the extrusion and molding fields. Marbon S-1 is light amber in color, is available in commercial quantities at low prices.

**Polydichlorostyrene**—Another modification of polystyrene developed during the war, is polydichlorostyrene. In this case, the heat distortion point was increased to above 230 F, without raising the h-f electrical power losses above those of regular polystyrene. It is transparent, with a slightly yellow color. The water absorption of polydichlorostyrene is lower than polystyrene. High cost restricts its uses at the present time. It is available in semicommercial quantities.

**Cross-Linked Styrene Copolymers**—These materials are of a thermosetting nature and, although they have distortion temperatures ranging from 217 to 235 F, they will withstand temperatures considerably above 300 F for short periods of time under light loads without ill effects. The available forms are restricted to cast rods and sheets, from which parts may be machined to close tolerances. These materials are priced somewhat higher than regular polystyrene, but considerably lower than the polydichlorostyrenes.

**Styrene Elastomer**—A group of flexible, rubberlike styrene elastomer resins (trade name Styraloy), met a wartime need for a cable sheathing with low power h-f losses yet possessing good durability and flexibility under wide temperature ranges. These resins are flexible in thin sections and yet are fairly rigid in thick sections. The power losses of the Styraloy resins are higher than the other styrene materials here discussed, and yet are low enough to be classified with them. They possess excellent abrasion resistance, and remain strong and flexible during long exposures to temperatures from minus 90 F to 212 F. Other properties are excellent resistance to corona attack at the reduced pressures of high altitudes, stableness to oxygen and ozone, and ease of fabrication.

The styrene elastomers are usually dark blue-gray colored and are available in production quantities in the low cost range.

**Polyethylene**—Polyethylene was first developed in England and was first used both in England and the United States as a dielectric material for flexible coaxial cables. Polyethylene theoretically closely approaches the ideal high-frequency insulation material in structure; and actually, its electrical properties are excellent. Its power factor and dielectric constant remain nearly constant over almost the complete electrical spectrum. Its volume and surface resistivity, arc resistance, and dielectric strength properties are excellent. In appearance, polyethylene is milky white, translucent, and wax-like. It has good flexibility in thin sheets, while in thick sections it is quite stiff and rigid.

Its distortion temperature under 66 psi load is 122 F, its softening range between 220 and 240 F, and it has been successfully used under low loads at temperatures considerably above 122 F.

The resistance of polyethylene to water and chemicals is outstanding. The standard water absorption figures usually given are between zero and 0.01 percent for 24-hour immersion. This material resists the action of all acids, alkalis, inorganic chemicals and has no known solvents at room temperature. Three months immersion will only produce slight swelling by such active solvents as ethyl acetate, methyl isobutylketone, carbon tetrachloride, and trichlorobenzene. At temperatures above 60 to 70 C, it will dissolve in a number of common sol-
<table>
<thead>
<tr>
<th>Property</th>
<th>Physical</th>
<th>Mechanical</th>
<th>Thermal</th>
<th>Electrical</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific Gravity</strong></td>
<td>0.97</td>
<td>1.2-2.3</td>
<td>1.5-3.5</td>
<td>0.75-1.5</td>
</tr>
<tr>
<td><strong>Specific Volume cu in/lbm</strong></td>
<td>0.99-0.92</td>
<td>2.1-2.33</td>
<td>1.5-3.5</td>
<td>10^12</td>
</tr>
<tr>
<td><strong>Water Absorption</strong></td>
<td>0.04-0.06</td>
<td>0.00-0.005</td>
<td>0.00-0.005</td>
<td>0.19-0.20</td>
</tr>
<tr>
<td><strong>Machinability</strong></td>
<td>Poor</td>
<td>Fair</td>
<td>Very Slow</td>
<td>No</td>
</tr>
<tr>
<td><strong>Impact Strength</strong></td>
<td>&lt;0.1</td>
<td>0.13-0.15</td>
<td>Slight</td>
<td>&gt;10 x 10^6</td>
</tr>
<tr>
<td><strong>Modulus of Elasticity in Tension psi x 10^6</strong></td>
<td>1.38-1.40</td>
<td>7,000-8,500</td>
<td>168-176</td>
<td>5.9-9</td>
</tr>
<tr>
<td><strong>Flexural Strength psi</strong></td>
<td>1.17-1.47</td>
<td>3,800-4,800</td>
<td>117-126</td>
<td>22-30</td>
</tr>
<tr>
<td><strong>Compressive Strength psi</strong></td>
<td>1.07-1.05</td>
<td>4,500-5,500</td>
<td>1,700-1,900</td>
<td>212-230</td>
</tr>
<tr>
<td><strong>Brittleness Temperature: F</strong></td>
<td>158-194</td>
<td>140-149</td>
<td>122 (66psi)</td>
<td>217-235</td>
</tr>
<tr>
<td><strong>Continuous: F</strong></td>
<td>0.32</td>
<td>0.40-0.56</td>
<td>0.5-0.68</td>
<td>2.5-4</td>
</tr>
<tr>
<td><strong>Surface Resistivity ohm cm</strong></td>
<td>2 x 10^11</td>
<td>2 x 10^10</td>
<td>4.0-4.8</td>
<td>&gt;10 x 10^10</td>
</tr>
<tr>
<td><strong>Volume Resistivity ohm cm</strong></td>
<td>2 x 10^12</td>
<td>2 x 10^14</td>
<td>2.4-2.9</td>
<td>&gt;10 x 10^10</td>
</tr>
<tr>
<td><strong>Elongation, percent</strong></td>
<td>&gt;10 x 10^6</td>
<td>2 x 10^13</td>
<td>2 x 10^14</td>
<td>&gt;10 x 10^6</td>
</tr>
<tr>
<td><strong>Shore Hardness D Scale</strong></td>
<td>60-60</td>
<td>50-60</td>
<td>60-60</td>
<td>60-60</td>
</tr>
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</tr>
<tr>
<td><strong>Shore Hardness D Scale</strong></td>
<td>60-60</td>
<td>50-60</td>
<td>60-60</td>
<td>60-60</td>
</tr>
</tbody>
</table>

Note: The above properties are approximate and may vary depending on the specific material and conditions.
### TABLE I — Continued — H-F PLASTIC INSULATION MATERIALS. ELECTRICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>POLYSTYRENE</th>
<th>MODIFIED POLYSTYRENE</th>
<th>MODIFIED STYRENE RESIN</th>
<th>POLY-DICHLORETHYLENE COPOLYMER</th>
<th>CROSS LINKED STYRENE COPOLYMER</th>
<th>STYRENE ELASTOMER</th>
<th>POLYETHYLENE</th>
<th>POLYETRAFLUOROETHYLENE</th>
<th>POLYVINYL CARBAZOLE</th>
<th>POLYISOBUTYLENE (APPROX 100,000 MOL WT)</th>
<th>CYCLOrubber</th>
<th>PROPERTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>120-135</td>
<td>500-800</td>
<td>370</td>
<td>450-500</td>
<td>300</td>
<td>1500</td>
<td>3000</td>
<td>1000-1100</td>
<td>1500</td>
<td>400-600</td>
<td>No</td>
<td>Carbonization</td>
</tr>
<tr>
<td>3,500</td>
<td>1,050-1,000</td>
<td>(0.040-0.045 in. thick)</td>
<td>&gt;1,720 (0.032 in. thick)</td>
<td>3,000 (0.005 in. thick)</td>
<td>1,000 (0.005 in. thick)</td>
<td>3,000 (0.001 in. thick)</td>
<td>2.6-2.7</td>
<td>620</td>
<td>Dielectric Constant 60 cps</td>
<td>1000 cps</td>
<td>1 mc</td>
</tr>
<tr>
<td>2.5-2.6</td>
<td>2.55</td>
<td>2.64-2.66</td>
<td>2.4-2.5</td>
<td>3.0</td>
<td>2.25-2.3</td>
<td>2.0</td>
<td>2.9-3.0</td>
<td>2.2-2.4</td>
<td>0.0008-0.00018</td>
<td>Power Factor 60 cps</td>
<td>100 mc</td>
</tr>
<tr>
<td>2.5-2.6</td>
<td>2.55 (300 kc)</td>
<td>2.7-2.9</td>
<td>2.4-2.5</td>
<td>2.0</td>
<td>2.25-2.3</td>
<td>2.0</td>
<td>2.9-3.0</td>
<td>2.2-2.4</td>
<td>0.0008-0.00018</td>
<td>...</td>
<td>Thin sheets</td>
</tr>
<tr>
<td>2.5-2.6</td>
<td>2.6</td>
<td>2.62</td>
<td>2.4-2.5</td>
<td>2.0</td>
<td>2.25-2.3</td>
<td>2.0</td>
<td>2.9-3.0</td>
<td>2.2-2.4</td>
<td>0.0008-0.00018</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>2.5-2.6</td>
<td>2.5</td>
<td>2.62</td>
<td>2.4-2.5 (ushl)</td>
<td>2.0</td>
<td>2.25-2.3</td>
<td>2.0</td>
<td>2.9-3.0</td>
<td>2.2-2.4</td>
<td>0.0008-0.00018</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>2.5-2.6</td>
<td>2.5</td>
<td>2.6</td>
<td>2.4-2.5</td>
<td>2.0</td>
<td>2.25-2.3</td>
<td>2.0</td>
<td>2.9-3.0</td>
<td>2.2-2.4</td>
<td>0.0008-0.00018</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>2.5-2.6</td>
<td>2.5</td>
<td>2.6</td>
<td>2.4-2.5</td>
<td>2.0</td>
<td>2.25-2.3</td>
<td>2.0</td>
<td>2.9-3.0</td>
<td>2.2-2.4</td>
<td>0.0008-0.00018</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>2.5-2.6</td>
<td>2.5</td>
<td>2.6</td>
<td>2.4-2.5</td>
<td>2.0</td>
<td>2.25-2.3</td>
<td>2.0</td>
<td>2.9-3.0</td>
<td>2.2-2.4</td>
<td>0.0008-0.00018</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>2.5-2.6</td>
<td>2.5</td>
<td>2.6</td>
<td>2.4-2.5</td>
<td>2.0</td>
<td>2.25-2.3</td>
<td>2.0</td>
<td>2.9-3.0</td>
<td>2.2-2.4</td>
<td>0.0008-0.00018</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>2.5-2.6</td>
<td>2.5</td>
<td>2.6</td>
<td>2.4-2.5</td>
<td>2.0</td>
<td>2.25-2.3</td>
<td>2.0</td>
<td>2.9-3.0</td>
<td>2.2-2.4</td>
<td>0.0008-0.00018</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>2.5-2.6</td>
<td>2.5</td>
<td>2.6</td>
<td>2.4-2.5</td>
<td>2.0</td>
<td>2.25-2.3</td>
<td>2.0</td>
<td>2.9-3.0</td>
<td>2.2-2.4</td>
<td>0.0008-0.00018</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>2.5-2.6</td>
<td>2.5</td>
<td>2.6</td>
<td>2.4-2.5</td>
<td>2.0</td>
<td>2.25-2.3</td>
<td>2.0</td>
<td>2.9-3.0</td>
<td>2.2-2.4</td>
<td>0.0008-0.00018</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

#### ELECTRICAL—Continued

- **Electrical Resistance**: 420 volts per 1000 ft (500 ft in thickness volts/mil)
- **Dielectric Strength**: 2.6-2.7 volts/mil (for plastics, 2 volts/mil is minimum acceptable value)
- **Power Factor**: 0.60 (at 60 Hz)

#### CHEMICAL EFFECT OF

- **Weak Acids**: Practically unaffected
- **Strong Acids**: Practically unaffected
- **Weak Alkalis**: Practically unaffected
- **Strong Alkalis**: Practically unaffected
- **Aromatic Hydrocarbons**: Practically unaffected
- **Aliphatic Hydrocarbons**: Practically unaffected
- **Mineral Oils**: Practically unaffected
- **Alcohols**: Practically unaffected
- **Esters**: Practically unaffected
<table>
<thead>
<tr>
<th>MANUFACTURERS</th>
<th>TRADE OR GENERIC NAMES</th>
<th>COSTS</th>
<th>ELECTRICAL USES</th>
<th>OUTSTANDING PROPERTIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bakelite Corp.</td>
<td>Bakelite</td>
<td>Low</td>
<td>Bakelite, condenser dielectrics, insulation, coil forms, connector bushings, cable spacers, sockets, *</td>
<td>Dimensional stability, non-inflammability, resistance to corroboration of chemicals, volume resistance.</td>
</tr>
<tr>
<td>Monsanto Chemical Co.</td>
<td>Monsanto</td>
<td>Medium</td>
<td>Extrusion, injection, compression molding, calendering, machining, wire coating.</td>
<td>High-temperature resistance, low water absorption, low temperature flexibility.</td>
</tr>
<tr>
<td>Loalin</td>
<td>Lustron</td>
<td>High</td>
<td>Extrusion, injection molding, extrusion, compression molding, machining.</td>
<td>Shock and abrasion resistance, compatibility with other materials.</td>
</tr>
<tr>
<td>Styron Dow Chemical Co.</td>
<td>Styron</td>
<td>Low</td>
<td>Extrusion, injection, compression molding, machining, calendering, wire coating.</td>
<td>High-temperature resistance, low water absorption, low temperature flexibility.</td>
</tr>
<tr>
<td>Bickell</td>
<td>Bickell</td>
<td>Low</td>
<td>Extrusion, injection molding, extrusion, compression molding, machining.</td>
<td>High-temperature resistance, low water absorption, low temperature flexibility.</td>
</tr>
</tbody>
</table>

* Available in these forms only from intermediate manufacturers, such as extruders, etc.
vents. Polyethylene is commercially available in a wide variety of forms and is low priced.

POLYTETRAFLUROETHYLENE — This material, known as Teflon, is a remarkable resin that possesses mechanical toughness over a wide range of temperatures and excellent electrical properties over a wide band of frequencies. Teflon is extremely chemically inert and has high heat resistance. Teflon has no true melting point, but undergoes a solid-phase transition at 620°F. At about 420°F small amounts of fluorine containing gases are given off, and at 750°F it decomposes slowly. While its heat distortion temperature is 266°F, it can be used over the temperature range of -100°F to 480°F.

The losses of Teflon are substantially constant from 60 cps to 3,000 mc and are as low or lower than either polystyrene or polyethylene. Its resistance to surface arc-over is extremely high and on failing it melts and vaporizes and does not leave a carbonized conducting path.

Except for molten alkalil metals, Teflon is resistant to all materials. Boiled in aqua regia, hydrofluoric acid, or fuming nitric acid, it has no change in weight or properties. The effect of strong alkalies and absorption of organic materials is almost zero, and outdoor weathering gives no detectable change in a one-year test.

It can be extruded in the form of rods and tubes or as a wire coating, though with present methods, the speeds are very slow compared to conventional extrusion speeds. Compression molding of simple articles can be done, but at present it is usually necessary to form more complicated shapes by machining standard shapes. Teflon can be machined easily with regular wood or metal working tools if they are kept sharp. Sheet stock can be punch pressed. So far, no usable cements have been found.

Teflon's properties suggest uses for all types of insulation, and as a dielectric in coaxial cable for radar and television equipment. Applications in electronic tire patching heaters, and for holding preforms in electronic heaters also seem likely.

Although Teflon is still in the pilot plant stage of development, limited quantities are available. Difficulty in fabrication, and high cost coupled with a specific gravity of 2.1—2.3 are limiting factors at this time. However, it is likely that the cost will be reduced with quantity production, and modifications of the material are being developed, to provide materials which can be fabricated with less difficulty.

POLYVINYL CARBAZOLE — Polyvinyl carbazole was first developed in Germany prior to the War as a mica and asbestos substitute. It is produced in this country under the name of Polecron. The outstanding property of Polecron is its high heat distortion temperature of 284°F to 320°F. Its limitations are low mechanical strength properties and it is therefore used where mechanical properties are secondary to electrical and thermal properties. To obtain tougher molded parts, it can be first oriented by extrusion under strong pressure, then broken into coarse fiberlike pieces; these can in turn be compression molded into parts which will still retain some of the orientation and will, therefore, be comparatively strong. It can also be injection molded, and can be cast from a solution of tetrahydrofuran into thin films for use as condenser dielectrics.

POLYISOBUTYLENE — Polyisobutylene was first made in Germany under the name of Oppanol, and later introduced here under the trade name of Vistanex. It is made in a wide range of molecular weights and varies from low molecular weight fluids, which are used as lubricants, to tough rubberlike polymers of high molecular weights. Vistanex is not used alone as an electrical insulation material because it undergoes considerable cold flow and has little structural strength. However, it is compatible with a wide variety of other materials and is used to change and improve their properties. Also, its structural difficulties can be materially improved by compounding with a variety of fillers.

Polyisobutylene differs from natural rubbers in that it cannot be vulcanized. It is essentially completely saturated and, therefore, has good resistance to strong chemicals and ozone. It is used in cable insulation and sheathing and is available in commercial quantities at low prices.

CYCLORUBBER — The cyclorubbers vary from tough flexible materials to brittle resins with lower power factors than the original rubbers from which the insulation is made. Cyclorubbers are compatible with natural and synthetic rubbers and many resins. They are also soluble in a wide variety of hydrocarbon solvents, including aliphatic and aromatic hydrocarbons, chlorinated hydrocarbons and some of the higher ethers. Typical uses are wire and cable insulation. Like Vistanex, cyclorubbers are commercially available in the low price brackets.

RECENT DEVELOPMENTS — The Monsanto Chemical Company has recently introduced an improved type of polystyrene called Lustron B. It has excellent moldability in standard injection and extrusion machines. Its heat distortion temperature is about 15°F higher than regular polystyrene. It has higher strength and quicker setting characteristics than conventional polystyrene. It is available now only in experimental quantities, but is expected to be commercially available later this year.

Enjay Company, an affiliate of Standard Oil Company of N. J., is producing two styrene type copolymers called S-50 and S-60. They are elastic and resinous, are excellent electrically, are very processable, and have good moisture-vapor resistance. These materials are now available in semi-commercial quantities in the medium price brackets, although the price should be lowered with possible future quantity production.

Another copolymer of polystyrene is being produced by Goodyear Tire and Rubber Company under the name of Pliolite S-3. This copolymer is a thermoplastic resin with excellent oxygen and chemical resistance and is composed of approximately 15 parts of butadiene and 85 parts of styrene. It is compatible with natural and most synthetic resins and is now used as a fortifying material by rubber manufacturers, as the copolymer improves the physical and electrical qualities, and gives better processing characteristics.

ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH
Graphical Symbols

### PHONE
- Single, or hearing aid receiver
- Double

### PICKUP or CUTTING HEAD
- General
- Electromagnetic
- Crystal

### ALARM
- Buzzer
- Bell

### CRYSTALS
- Detector
- Piezoelectric

### SHIELDING
- General
- Individually shielded wires
- Shielded pair

### JACK

### PLUG

### RECTIFIER (Dry disk)
- Half-wave
- Arrow points in direction of low resistance

### THERMO-COUPLE
- Indirectly heated
- Directly heated

### THERMOELEMENT

### VIBRATOR
- Synchronous
- Nonsynchronous

### RELAY (Deenergized)
- Make
- Break
- Mechanical coupling, insulated

### CONTACTORS
- Normally open
- Normally closed

### SOLENOID
- Plunger-type

### TUBES
- Filament
- Indirectly heated cathode
- Cold cathode
- Photo-electric cathode
- Loop coupling
- Gas filled
- Pool cathode
- Grid
- Deflecting electrode

- Anode
- X-ray target
- Dynode
- Ignitor
- Excitor
- Internal shield
- Single-cavity envelope
- Double-cavity envelope
- Triode
- Pentode
- Cathode-ray indicator tube
- Cold-cathode gas diode
- Phototube
- Cathode-ray tube
- Magnetron
- Split magnetron
- Single-cavity velocity-modulated tube
- Double-cavity velocity-modulated tube
- Multiplier phototube
- Ignitron with grid
- Excitron with grid and holding anode

Abstracted from American Standards Association publications Z32.10-1944 and Z32.5-1944. Note that all lines are the same thickness. Leads can come out of symbols any convenient way.
for Electronic Diagrams

<table>
<thead>
<tr>
<th>RESISTOR</th>
<th>COIL</th>
</tr>
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<tbody>
<tr>
<td>Fixed</td>
<td>Air-core</td>
</tr>
<tr>
<td>With terminals</td>
<td>Tapped</td>
</tr>
<tr>
<td>Tapped</td>
<td>Variable coupling</td>
</tr>
<tr>
<td></td>
<td>One winding</td>
</tr>
<tr>
<td></td>
<td>Auto-transformer</td>
</tr>
<tr>
<td></td>
<td>Variable transformer</td>
</tr>
<tr>
<td></td>
<td>One movable</td>
</tr>
<tr>
<td></td>
<td>Variable core</td>
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<table>
<thead>
<tr>
<th>CAPACITOR</th>
<th>LOUDSPEAKER</th>
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<tr>
<td>Curved plate</td>
<td>General</td>
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<td></td>
<td>Magnetic</td>
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<tr>
<td></td>
<td>P-M dynamic</td>
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<tr>
<td></td>
<td>Electrodynamic</td>
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<table>
<thead>
<tr>
<th>MICROPHONE</th>
<th>WIRING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed</td>
<td>Terminal, contact, or pivot point</td>
</tr>
<tr>
<td>Variable</td>
<td>No connection</td>
</tr>
<tr>
<td></td>
<td>Connections</td>
</tr>
<tr>
<td>Variable differential</td>
<td></td>
</tr>
<tr>
<td>Mechanical linkage</td>
<td></td>
</tr>
<tr>
<td>Trimmer</td>
<td>On-off</td>
</tr>
<tr>
<td>Split stator</td>
<td>Multiposition Key</td>
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</table>

<table>
<thead>
<tr>
<th>ANTENNA SYSTEM</th>
<th>FUSE</th>
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<tbody>
<tr>
<td>Antenna</td>
<td>HEATER ELEMENT</td>
</tr>
<tr>
<td>Counterpoise</td>
<td>GENERAL</td>
</tr>
<tr>
<td></td>
<td>Place legend in or near box</td>
</tr>
<tr>
<td>Loop</td>
<td></td>
</tr>
<tr>
<td>Ground</td>
<td></td>
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<table>
<thead>
<tr>
<th>BATTERY</th>
<th>A-C VOLTAGE SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long line is</td>
<td>MOTOR OR GENERATOR</td>
</tr>
<tr>
<td>always positive</td>
<td></td>
</tr>
<tr>
<td>One cell</td>
<td></td>
</tr>
<tr>
<td>Multicell</td>
<td></td>
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<table>
<thead>
<tr>
<th>NEW SYMBOLS PROPOSED BY IRE</th>
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<tbody>
<tr>
<td>Powdered iron core</td>
<td>Waveguide</td>
</tr>
<tr>
<td>Nonferrous metal core</td>
<td>Waveguide output</td>
</tr>
<tr>
<td>Variable cores (Circle on arrow indicates variability of core)</td>
<td>Coaxial output</td>
</tr>
<tr>
<td></td>
<td>Tunable multiple-cavity anode</td>
</tr>
<tr>
<td></td>
<td>Disk or surface seals for uhf</td>
</tr>
<tr>
<td></td>
<td>Split anode</td>
</tr>
</tbody>
</table>

ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH
MODULATION Types and

MODULATION is the process of modifying a wave (called carrier), some characteristic of which is made to vary as a function of the instantaneous value of another wave (called modulating wave or signal). Carrier can be a direct current, an alternating current (provided its frequency is above the highest frequency component in the modulating wave), or a series of regularly repeating, uniform pulses (provided the repetition rate is at least twice that of the highest frequency to be transmitted) called a pulse chain.

Minimum bandwidth that must be transmitted by carrier circuits, and signal-noise ratio that can be expected from unavoidable fluctuation (thermal) noises, are given in the chart. Fluctuation noise level depends on effective temperature of the transmission path. Significance of symbols used in the chart is indicated in the accompanying table of nomenclature.

A recently applied modulation method uses pulses. The fundamental difference between pulse modulation and other forms of modulation is that the signal is instantaneously sampled periodically and the sample so obtained used in the modulation. Thus in pulse modulation the carrier is varied in accordance with the instantaneous value of the modulating wave at the moment of sampling. Furthermore, as usually employed, the carrier is a chain of uniform, regularly repeated pulses instead of a continuous sine wave. This pulse chain constitutes a subcarrier that modulates the transmitted (sinusoidal) carrier for use in radio and wire transmission.

The pulse chain (subcarrier) has parameters of height, width, repetition rate, and displacement from normal occurrence of individual pulses. Each of these parameters can be modulated. In addition, such secondary parameters as displacement between pairs of pulses or number or density of pulses can be modulated. Width modulation can be such as to symmetrically vary pulse width or to modulate only its leading or trailing edge. Thus there are a great variety of pulse modulations. Simpler ones are shown in the illustration and included in the chart. Regardless of how pulses of

<table>
<thead>
<tr>
<th>MODULATION METHOD</th>
<th>TRANSMISSION BANDWIDTH</th>
<th>SIGNAL/NOISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMPLITUDE (a-m)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>double sideband and carrier</td>
<td>$f_m$</td>
<td>$(S/N)f_m = (G/N)f_t$</td>
</tr>
<tr>
<td>single sideband and carrier</td>
<td>$f_m$</td>
<td></td>
</tr>
<tr>
<td>FREQUENCY (f-m)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>wideband</td>
<td>$(f_m &lt; f_d)$</td>
<td>$(S/N)f_m = \sqrt{G/N}f_t (f_d/f_m)$</td>
</tr>
<tr>
<td>narrowband</td>
<td>$(f_m &gt; f_d)$</td>
<td></td>
</tr>
<tr>
<td>frequency shift—</td>
<td>Usually at least the third harmonic of the keying frequency $f_k$ must be transmitted, thus $f_m + 3f_k$, using this value of $f_m$ see above</td>
<td></td>
</tr>
<tr>
<td>PHASE (p-m)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>double sideband and carrier</td>
<td>$f_m$</td>
<td>$(S/N)f_m = \phi (G/N)f_t$</td>
</tr>
<tr>
<td>single sideband and carrier</td>
<td>$f_m$</td>
<td>$(S/N)f_m = \phi (G/N)f_t$</td>
</tr>
<tr>
<td>PULSE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>height — — (pm)</td>
<td>Depends on repetition rate, waveshape, and duration of pulse; for approximations use $2/t_p$ where $t_p$ is duration of pulse in microseconds, transmitted bandwidth is in megacycles per second</td>
<td></td>
</tr>
<tr>
<td>width — — (pm)</td>
<td>$(S/N)f_m = m_w t_p (G/N)f_t$</td>
<td></td>
</tr>
<tr>
<td>rate — — (pm)</td>
<td>$(S/N)f_m = m_d t_p (G/N)f_t$</td>
<td></td>
</tr>
<tr>
<td>number — — (pm)</td>
<td>$(S/N)f_m = m_n t_p (G/N)f_t$</td>
<td></td>
</tr>
<tr>
<td>displacement (pm)</td>
<td>$(S/N)f_m = m_d t_p (G/N)f_t$</td>
<td></td>
</tr>
<tr>
<td>(pulse displaced either in position or time)</td>
<td>$(S/N)f_m = m_d t_p (G/N)f_t$</td>
<td></td>
</tr>
<tr>
<td>PULSED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>amplitude (pm)</td>
<td>$8f_m$</td>
<td>Inferior to unmodulated modulations of like type unless pulse rate is very high and transmitted bandwidth is very wide</td>
</tr>
<tr>
<td>frequency (pm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>phase (ppm)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
By FRANK ROCKETT

Characteristics

the chain are modulated, the signal sampling itself remains unaltered in both rate and timing in pure pulse modulation.

Signal-noise ratio obtainable with pulse modulation can be greatly improved by clipping and limiting circuits, and depends in a complex manner on transmission bandwidth. The transmission bandwidth in turn depends on pulse shape as well as pulse rate and method and degree of modulation. Relations given indicate orders of magnitudes. More detailed equations are beyond the scope of this presentation.

The pulse chain is not used directly as carrier; it modulates the r-f carrier, usually in amplitude. At the bottom of the illustration are shown the three ways in which the pulse can modulate the r-f carrier. To illustrate the modulation, height-modulated pulses are assumed. These patterns illustrate the sampling nature of pulse modulation; modulation is constant during the pulse at the value determined by the modulating wave at the time of sampling.

The advantage of pulse modulation is that energy is transmitted only for short intervals. This advantage is usually retained in pulsed carrier modulation, although that is not necessary; the carrier could equally well return to its unmodulated state between pulses rather than be interrupted.

Uses of a-m; f-m, and p-m are familiar. Pulse height modulation is not greatly used, although it is readily produced, because the pulsed equipment must be linear and operate at an average of only 50 percent of its maximum capabilities. Pulse width modulation is commonly used in modulating and demodulating other pulse modulations. If it is differentiated or gated, pulse displacement modulation is obtained. If a pwm chain is passed through a low-pass filter, the signal will be removed directly. Thus pwm is a convenient intermediary. However, pwm involves a variation of duty cycle that lowers operating efficiency of the equipment. A combination of pulse width and rate modulation has been suggested as a means of holding the duty cycle constant to avoid this drawback. Pulse rate modulation also suffers from change of duty cycle during the modulating cycle and so is not commonly used. Pulse displacement modulation, called interchangably pulse time or pulse position modulation, is widely used in microwave time division multiplex because it permits interlacing several pulse chains without confusion. Other pulse modulations present like possibilities if depth of modulation is limited.

Usually 100 percent pulsed-amplitude carrier modulation is used because it is the simplest method for modulating magnetrons and klystrons. Furthermore, because of wide bandwidths (despite high selectivity, absolute bandwidth is large at uhf, and frequency drifts of equipment prohibit very high selectivity) of uhf communication systems, pulsed modulation may as well be employed to utilize the available bandwidth. Pulsed frequency modulation, in the form of carrier shift, is used, and has been suggested for introducing the audio channel into the video carrier between television lines. Pulsed-amplitude carrier modulation with width-modulated pulse chain has also been used for this application.
## Standard Receiving Tubes

<table>
<thead>
<tr>
<th>INDEX NO.</th>
<th>OLD STYLE</th>
<th>OCTAL BASE</th>
<th>LOCTAL BASE</th>
<th>MINIATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>2.5 V</td>
<td>0.3 A</td>
<td>0.15 A</td>
</tr>
<tr>
<td>1</td>
<td>Twin Diode</td>
<td>6H6</td>
<td>12H6</td>
<td>7A6</td>
</tr>
<tr>
<td>2</td>
<td>One Diode</td>
<td>7CA</td>
<td>12Q3</td>
<td>9006</td>
</tr>
<tr>
<td>10</td>
<td>Diode and Amplifier</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Twin Diode and Triode</td>
<td>μ=8</td>
<td>55</td>
<td>6V7</td>
</tr>
<tr>
<td>12</td>
<td>Twin Diode and Triode</td>
<td>μ=16</td>
<td>85</td>
<td>6V7</td>
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<tr>
<td>13</td>
<td>Twin Diode and Triode</td>
<td>μ=70</td>
<td>6Q7</td>
<td>6SR7</td>
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<tr>
<td>14</td>
<td>Twin Diode and Triode</td>
<td>μ=100</td>
<td>2A6</td>
<td>75</td>
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<td>15</td>
<td>Twin Diode and Pentode</td>
<td></td>
<td>2B7</td>
<td>687</td>
</tr>
<tr>
<td>16</td>
<td>One Diode and Pentode</td>
<td></td>
<td>6SF7</td>
<td>12SF7</td>
</tr>
<tr>
<td>20</td>
<td>Converters and Mixers</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>3 Grid Leads; (For Mixer Only)</td>
<td></td>
<td>6L7</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>4 Grid Leads; (2 Between K and SG)</td>
<td>2A7</td>
<td>6A7</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>4 Grid Leads; (1 Between K and SG)</td>
<td>2A7</td>
<td>6A7</td>
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<tr>
<td>24</td>
<td>Triode-Hexode</td>
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<td>6K8</td>
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<tr>
<td>25</td>
<td>Triode-Heptode</td>
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<td>6J8</td>
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<tr>
<td>30-40</td>
<td>Voltage Amplifiers</td>
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<tr>
<td>31</td>
<td>Triode</td>
<td>μ=14</td>
<td>56</td>
<td>76</td>
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<tr>
<td>32</td>
<td>Triode</td>
<td>μ=20</td>
<td>6C5</td>
<td>6L5</td>
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<tr>
<td>33</td>
<td>Triode</td>
<td>μ=70</td>
<td>6K5</td>
<td></td>
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<td>34</td>
<td>Triode</td>
<td>μ=100</td>
<td>6F5</td>
<td>6F5</td>
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<tr>
<td>35</td>
<td>Twin Triode</td>
<td>μ=20</td>
<td>6F8</td>
<td>12F5</td>
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<tr>
<td>36</td>
<td>Twin Triode</td>
<td>μ=35-38</td>
<td>6C8</td>
<td>6F7</td>
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<tr>
<td>37</td>
<td>Twin Triode</td>
<td>μ=70</td>
<td>6F7</td>
<td>12F7</td>
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<tr>
<td>40</td>
<td>Triple-grid Det-Amp (Sharp Cutoff)</td>
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<tr>
<td>41</td>
<td>Gm=1250, I1=2ma, R2=1meg</td>
<td>57</td>
<td>77</td>
<td>6C6</td>
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<tr>
<td>42</td>
<td>Gm=2400, I1=9ma, R2=8000</td>
<td>6J7</td>
<td>12J7</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Gm=3100 to 6000</td>
<td>6SH7</td>
<td>12SH7</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Gm=9000 to 12000</td>
<td>16AC7</td>
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<td></td>
</tr>
<tr>
<td>45</td>
<td>Triple Grid Super Control (Remote Cutoff)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Gm=1500, I1=8ma, E1=−3V</td>
<td>58</td>
<td>39/44</td>
<td>77</td>
</tr>
<tr>
<td>46</td>
<td>Gm=4000, I1=10ma, E1=−1½V</td>
<td>6SK7</td>
<td>12SK7</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Gm=5000, I1=13ma, E1=−3V</td>
<td>16AB7</td>
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<td></td>
</tr>
</tbody>
</table>

Δ 0.6 A Filament.  ○ 0.8 A Filament.  † 0.45 A Filament.  * 0.075 A Filament.
RECEIVING TUBES

A handy classification of tubes arranged according to their functions so that pertinent characteristics appear at a glance for comparison with other types.

### Power Amplifiers, Rectifiers, Tuning Indicators

#### Triodes

<table>
<thead>
<tr>
<th>#</th>
<th>Filament Type</th>
<th>OLD STYLE BASE</th>
<th>OCTAL BASE</th>
<th>LOCTAL BASE</th>
<th>MINIATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>51</td>
<td>Triode and Power Pentode</td>
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#### Pentodes

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<td>6Y6, 7C5</td>
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#### Beam Power Types

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#### Power Rectifiers

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#### Heater Types

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### Tuning Indicators

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<td>22 V</td>
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101 With Internal Amplifier

102 Without Amp (Dual Type)

### Low Drain, Battery Types

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<td>0.10 A</td>
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#### Diode and Amplifier

110 Twin Diode and Triode

112 Twin Diode and Triode $\mu = 20$

113 One Diode and Triode $\mu = 65$

115 Twin Diode and R-F Pentode

116 One Diode and R-F Pentode

117 One Diode and Power Pentode

118 Diode-Triode—R-F Pentode

119 Diode-Triode, Power Pentode

120 Pentagrid Converters

122 2 Grids Between SG and Fil.

123 1 Grid Between SG and Fil.

130-140 Voltage Amplifiers

130 Triodes

131 Triode $\mu = 8.8$

132 Triode $\mu = 14$

140 Pentodes

141 Sharp Cut-Off $(-4 V)$

142 Medium Cut-Off $(-8 V)$

143 Remote Cut-Off $(-12 V)$

145 Super Control $(-15 V)$

149 Same, No Suppressor

160-170 Power Amplifiers

162 Twin Triode (Class B)

163 Single Pentode

169 Twin Pentode

171 Beam-Power Amplifier

$^*$ 0.24 A Filament.

$\%$ 0.12 A Filament.
### INDEX BY TUBE TYPES

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Although these are some of the grand-daddies of those listed and although they are still functioning to a highly satisfactory degree in many older equipments, their characteristics are not sufficiently similar to their modern progeny and their use too limited to warrant special treatment.

---

**HONORABLE MENTION**

EIGHT historic tube types that are not listed are the 24A, 26, 27, 35/51, 37, 38, 45 and 71A. Although these are some of the grand-daddies of those listed and although they are still functioning to a highly satisfactory degree in many older equipments, their characteristics are not sufficiently similar to their modern progeny and their use too limited to warrant special treatment.

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**NUCLEONICS**

**1896**  
Radioactivity discovered by Becquerel

**1897**  
Electrons discovered by J. J. Thomson

---

**1904**  
Alpha particles discovered by Rutherford

**1912**  
Proton first accurately described by Rutherford and Bohr

**1932**  
Neutron discovered by Chadwick

**1934**  
Positron discovered by Anderson

**1935**  
Neutrino existence assumed by Pauli and Fermi

**1936**  
Meson or mesotron postulated on basis of theory by Yukawa in 1935

**1938**  
Van de Graaff electrostatic particle accelerator

**1932**  
The cyclotron first described by Lawrence

**1938**  
Uranium fission discovered by Hahn and Strassmann

**1941**  
Betatron developed by Kerst

**1942**  
Fermi uranium pile operated successfully

**1944**  
Synchrotron developed by Veksler

---

**Other Historic Developments**

**1912**  
Wilson develops cloud chamber

**1912**  
Radioactive tracers first used by von Hevesy and Paneth

**1913**  
Rutherford and Bohr describe atom with all positive charge and mass in nucleus

**1919**  
Rutherford transmutes nitrogen to oxygen

**1919**  
Aston develops mass spectrograph

**1928**  
Geiger and Muller develop their counter

**1932**  
Van de Graaff electrostatic particle accelerator

**1938**  
Uranium fission discovered by Hahn and Strassmann

**1941**  
Betatron developed by Kerst

**1942**  
Fermi uranium pile operated successfully

**1944**  
Synchrotron developed by Veksler

**1945**  
Atomic bomb dropped on Japan
<table>
<thead>
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<th><strong>THE NUCLEONIC &quot;PARTICLES&quot;</strong></th>
<th><strong>MASS</strong></th>
<th><strong>CHARGE</strong></th>
<th><strong>HOW PRODUCED</strong></th>
<th><strong>TYPICAL NUCLEAR REACTIONS</strong></th>
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<tbody>
<tr>
<td><strong>BETA RAYS</strong>&lt;br&gt;( {\beta}^+ ) and ( {\beta}^- )&lt;br&gt;High speed + and - electrons created by conversion of protons into neutrons and vice-versa</td>
<td>( 5.45 \times 10^{-4} ) relative to oxygen = 16</td>
<td>( -(4.8029 \pm 0.0005) \times 10^{-10} \text{ esu} )</td>
<td>Emitted by natural and artificial radioactive atoms; also produced by bombardment of nuclei by protons, neutrons, alpha particles, gamma rays</td>
<td>( 7\text{Ni}^{13} + \text{C}^{14} + \beta^+ + \beta^- \rightarrow \gamma ) ( 1\text{Na}^{24} \rightarrow \text{Mg}^{24} + \beta^- )</td>
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<tr>
<td><strong>PROTON</strong>&lt;br&gt;Hydrogen nucleus ( \text{H}^+ )</td>
<td>1.0089</td>
<td>( + (4.8029 \pm 0.0005) \times 10^{-10} \text{ esu} )</td>
<td>Produced by bombardment of nuclei by alpha particles, deuterons, neutrons, etc.; also believed to be main component of primary cosmic rays</td>
<td>( 3\text{Li}^6 + \text{H}^+ \rightarrow \text{He}^4 + \text{He}^3 ) ( 20\text{Ca}^{24} + \text{H}^2 \rightarrow \text{Sc}^{44} + \text{O}^{11} )</td>
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<tr>
<td><strong>NEUTRON</strong>&lt;br&gt;Uncharged particle ( \text{n}^0 )</td>
<td>1.0089</td>
<td>0</td>
<td>Produced by bombardment of nuclei by protons, neutrons, alpha particles</td>
<td>( 13\text{Al}^{27} + \text{H}^0 \rightarrow \text{Al}^{28} + \gamma ) ( \gamma \text{ photon} \rightarrow \beta^- + \beta^+ )</td>
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<tr>
<td><strong>DEUTERON</strong> ( \text{H}^1 )&lt;br&gt;Proton and Neutron strongly bound together</td>
<td>2.0147</td>
<td>( + (4.8029 \pm 0.0005) \times 10^{-10} \text{ esu} )</td>
<td>Produced by bombardment of nuclei by protons, neutrons, alpha particles</td>
<td>( 1\text{Na}^{23} + \text{H}^2 \rightarrow \text{Na}^{24} + \text{H}^1 ) ( 6\text{Cl}^{12} + \text{H}^2 \rightarrow 7\text{N}^{13} + \text{O}^0 )</td>
</tr>
<tr>
<td><strong>POSITRON</strong> ( \beta^+ )&lt;br&gt;Positive electron</td>
<td>( 5.5 \times 10^{-4} )</td>
<td>( + (4.8029 \pm 0.0005) \times 10^{-10} \text{ esu} )</td>
<td>Ejected from nuclei by cosmic rays; nuclear bombardment by gamma rays, alpha particles, etc.</td>
<td>( 29\text{Cu}^{62} \rightarrow 28\text{Ni}^{62} + \beta^+ + \gamma ) ( \gamma \text{ photon} \rightarrow \beta^- + \beta^+ )</td>
</tr>
<tr>
<td><strong>ALPHA PARTICLE</strong> ( \text{He}^+ )&lt;br&gt;Helium nucleus</td>
<td>4.004</td>
<td>( + (4.809 \pm 0.0005) \times 10^{-10} \text{ esu} )</td>
<td>Emitted by natural and artificial radioactive atoms; nuclear bombardment by protons, deuterons, etc.</td>
<td>( 13\text{Al}^{27} + 2\text{He}^4 \rightarrow 14\text{Si}^{30} + \text{O}^{11} + \beta^+ ) ( 13\text{Al}^{27} + 2\text{He}^4 \rightarrow 15\text{P}^{31} + \text{O}^{11} + \beta^- )</td>
</tr>
<tr>
<td><strong>NEUTRINO</strong>&lt;br&gt;Too small to detect directly, but strong indirect evidence, experimental and theoretical, for its existence</td>
<td></td>
<td>0</td>
<td>Assumed to accompany beta ray disintegration of nuclei to explain energy distribution of beta rays</td>
<td>( 9\text{F}^{17} \rightarrow \text{O}^{17} + \beta^- + \text{neutrino} ) ( 4\text{Ag}^{110} \rightarrow 4\text{Cd}^{110} + \beta^- + \text{neutrino} )</td>
</tr>
<tr>
<td><strong>GAMMA RAYS</strong>&lt;br&gt;( \gamma )&lt;br&gt;Photons of energy ( h \nu = \gamma )&lt;br&gt;( \nu = ) frequency&lt;br&gt;( h = ) Planck's constant ( 6.56 \times 10^{-27} )</td>
<td></td>
<td>No charge</td>
<td>Emitted by natural and artificial radioactive atoms; also produced by nuclear bombardment</td>
<td>( 4\text{He}^8 + \gamma \rightarrow 4\text{He}^8 + \text{O}^{10} )</td>
</tr>
<tr>
<td><strong>MESON or MESOTRON</strong>&lt;br&gt;When ejected from nucleus is radioactive with mean life of 2 microseconds</td>
<td>202 electron masses&lt;br&gt;Lighter mesons are also believed to exist but have not been measured because of shorter lives</td>
<td>( -(4.8029 \pm 0.0005) \times 10^{-10} \text{ esu} ) and ( + (4.8029 \pm 0.0005) \times 10^{-10} \text{ esu} ) and 0</td>
<td>Produced by action of primary cosmic rays on atmosphere</td>
<td>Primary cosmic ray particle + atom in atmosphere \rightarrow meson + other disintegration products</td>
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</table>
CONSULTING ENGINEERS

Electronics presents, in this directory of consulting engineers active in its field, the results of a survey. The first column lists names and addresses. An asterisk after a name indicates that patent matters are handled, in addition to the work noted in subsequent columns. The second and third columns indicate the type of consulting work done. Numbers in these columns provide a further breakdown, and are explained at the bottom of this page. Some types of work have been consolidated. For example: test equipment consultants are listed under instrumentation (5), and radiation consultants are listed under wave propagation (11).

<table>
<thead>
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<th>Name</th>
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<td>BLEEMNSMA, F. J.*</td>
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*Handle Patents

Some types of work have been consolidated. For example: test equipment consultants are listed under instrumentation (5), and radiation consultants are listed under wave propagation (11).
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<tr>
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<td>BOSSARD, G.*</td>
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<td>BOYCE, H. JAY*</td>
<td>61 Fairfield Ave., Cranberry, Conn.</td>
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<td>BROWN, C.</td>
<td>66 Westgate, Cambridge, Mass.</td>
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<td>BROWNELL, H.</td>
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<tr>
<td>CRAWFORD, THOMAS J.</td>
<td>3726 Kipling Ave., Berkeley, Mich.</td>
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<td>CHILDS, EARL</td>
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<td>CONSOLIDATED MANAGEMENT CONSULTANTS</td>
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<td>CORBELL, HOWLAND, HAYES &amp; MERRYFIELD</td>
<td>212 Rennie Bldg., Corvallis, Ore.</td>
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### Consulting Engineers

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<td>2 East End Ave., New York, N. Y.</td>
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* [Name of company] is a consulting engineering firm.

**Note:** The table lists engineering companies and their locations across the United States and internationally. The columns indicate the company's name, the address, number of employees, and whether they are located in the United States or internationally. The terms "national" or "state" refer to the geographic scope of their operations. The "area" column specifies the specific city or area where the company is located. The "communications" column notes the type of services offered, such as design, models, or communications. The "design models" column specifies the type of models or services they provide. The "area" column indicates the geographic area they serve, which can be national, state, or local. This information is essential for understanding the scope and reach of these engineering firms.
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<td>R. L. Clark (inactive)</td>
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<td>R. M. S. ASSOCIATES, INC.</td>
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<td>R. L. Družba, Belgrade, Y. 1-4</td>
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<td>Rose Hill Ave., St. Bernard, Cincinnati, Ohio</td>
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<td>Quadrat Crystal traveler</td>
<td>quartz crystals</td>
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<td>Name</td>
<td>Commu-</td>
<td>Indus-</td>
<td>Design Models</td>
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<td>STEVENS, ROBERT*</td>
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<td>STEVENS-ARNOLD CO., INC.*</td>
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<td>STINER, H. WRAY</td>
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<tr>
<td>STROBO RESEARCH</td>
<td>22</td>
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<td>SYSTEMS RES. FIELD LAB.</td>
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<tr>
<td>TECHNOLOGY, INC.</td>
<td>1</td>
<td>1000</td>
<td>miles</td>
</tr>
<tr>
<td>THERMIONIC ENGR. CORP.*</td>
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Applications of SONIC and ULTRASONIC VIBRATIONS

Subaudible, audible, and superaudible mechanical vibrations are now finding widespread utilization in industrial testing and processing, communication, and navigation. Among the new uses for vibrations, particularly in the superaudible or ultrasonic range, are destructionless testing, killing germ life, emulsifying immiscible liquids, and measuring vibrational strains in structural members.

By A. A. McKenzie and Frank Rockett

APPLICATIONS OF SONICS AND ULTRASONICS

- Measuring elastic and dissipative properties of solids
- Engine (gas and steam) pressure indication and detonation
- Detecting noise and vibration in engines and machinery
- Measuring vibrational strains in structural members
- Determination of pressure zones in pillars
- Measuring elasticity of yarns
- Detection of schools of fish
- Geophysical prospecting
- Measurement of fluid depth in wells
- Hydrographic surveying
- Sonar—sound navigation and ranging
- Induction of molecular rearrangement
- Determination of physical properties of liquids and gases
- Detecting air bubbles in aircraft bearings
- Killing staphylococci bacteria and bacteriophage
- Breaking sulfathiazole crystals for faster reaction
- Development of antibodies by jarring antigens loose from shattered germs
- Mixing powdered metals in manufacture of cemented carbide tools
- Detecting separations in bonded metal strips
- Mercury delay line
- Detecting icebergs
- Homogenization of milk
- Emulsification for giving smoother ice cream, mayonnaise, and other food products
- Acceleration in ageing wines and spirits
- Acceleration of chemical reactions
- Transformation of chemical compounds
- Stimulation or destruction of bacteria in food products
- Underwater signaling
- Echo depth sounding
- Treating seeds to stimulate plant growth
- Increasing plant yield
- Flocculation of suspended particles or gas bubbles in liquids
- Transformation of crystal structures
- Killing of small fish and frogs
- Heating of media that absorb sonic waves
- Movements of particles into nodes of standing wave systems
- Mixing of metals to produce alloys
- Detection of imperfections in castings
- Emulsification of oil and water
- Emulsification of mercury and water mixtures
- Drilling glass with another piece of glass
- Dispersion of metal from a cathode during electrolysis (manufacture of catalytic agents)
- Increasing oxidation reactions
- Changing starch into dextrine
- Decomposing gums and gelatin
- Speeding solidification of molten tin and aluminum
- Producing finer-grain metals
- Speeding uniform cooling and hardening of steel
- Degassing of liquids
- Freezing fused metals from gas inclusion
- Coagulating aerosols
- Precipitation of industrial smokes
- Testing metals for hardness
- Testing metals for defects
- Increasing virulence of bacteria
- Decreasing virulence of bacteria
- Disintegration of cells to release endotoxins, enzymes, polysaccharides, and hemoglobin under aseptic conditions
- Treatment of plastics for clothing
- Treating paint for smoother, more durable finish and decreased drying time
- Distribution of photographic emulsions for fine-grain film
- Liquefaction of iron hydroxides
- Measurement of metal thickness
- Tinning aluminum sheet
- Production inspection of metal sheet
- Opening garage doors
- Production of cavitation
- Vibration testing of airplanes
- Dispersion of fog
- Determination of saline and silt levels in hydrography
- Absolute altimeter
- Bias for magnetic recording
- Television light valve
- Inaudible superimposed radio signaling
- Compression and expansion of media through which the ultrasonic waves pass
- Subsea geophysical prospecting
- Radar and loran trainers
- Examination of automobile tires for flaws

DEFINITIONS

Subaudible: below the limit of hearing
Superaudible: above the limit of hearing
Sonic: utilizing sound waves
Ultrasonic: utilizing sound waves for purposes other than hearing

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
## SONIC AND ULTRASONIC FREQUENCY PHENOMENA

<table>
<thead>
<tr>
<th>MEGACYCLES</th>
<th>1,000 KILOCYCLES</th>
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<tr>
<td>1,000 KILOCYCLES</td>
<td>100 — Killing Germ Life in Canned Foods</td>
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<tr>
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<td>20 — Upper Range General Motors Sonigage</td>
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<td></td>
<td>15 — Radar Trainer — MIT Velocity and Absorption Studies in Liquids</td>
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<td>14 — Interferometer Studies with Televise Ultrason</td>
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<td>12 — Upper Range Sperry Reflectoscope</td>
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<td>10 — German Aircraft Bearing Testing</td>
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<td>7.5 — Practical Upper Limit Televise Ultrason</td>
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<td>5 — Upper Range Brush Thrusay</td>
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<td></td>
<td>2.8 — Upper Range Branson Audigage</td>
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<td>2.25 — Middle Frequency Sperry Thrusay</td>
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<td>2 — Vacuum Tube Arc in Air By Palaeontogans</td>
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<td>1.6 — Upper Radio-Frequency Limit of Standard Broadcast Band</td>
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<td>1.5 — Upper Range Crystalab Ultra-Sonarator</td>
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<td>1.4 — Lower Range Branson Audigage</td>
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<td>1 — G.E. Materials Tester — Lower Range Sperry Thrusay — Upper Range Brush</td>
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<td>Hypersonic Analyzer — Penicillin Production</td>
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<td>15 — Early Underwater Signal Experiments by Langevin — Black Pole Warbler — Newly Hatched Robins</td>
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<td>14.2 — Common Meadow Grasshopper</td>
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<td>12 — Aluminum Sheets Tinned In Zinc Bath</td>
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<tr>
<td>10 — Lower Range Tests of Flocculating Aerosols — Upper Range Ship's Propeller at 1,000 Yards — Lower Limit Sonar QIA</td>
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<td>9.3 — Staphlococci Bacteria Killed</td>
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<td>9 — Submarine Signal Co. Laboratory Oscillator</td>
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<tr>
<td>8.3 — Brown Cricket</td>
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<td>8 — Lower Limit Sonar QJ</td>
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<td>7.1 — Common Meadow Grasshopper</td>
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<td>7 — Tone of Bats (1/4-Second Pulses)</td>
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<td>5 — Ammonium Chloride Smoke Flocculation Experiments</td>
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<td>4.186 — Upper Limit Standard Piano</td>
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<td>4 — Tone Broadcast by Radio Station WWV</td>
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<td>3.5 — Nondillon Sonic-Altimeter, 1928</td>
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<td>2.5 — Upper Range Chesapeake Bay Cracker</td>
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<td>2 — Lower Range Snapping Shrimp In Coral Waters — Upper Range Sea Robins — Delsasso Sonic Altimeter</td>
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<td>1.1747 — Upper Range Soprano, D Two Octaves Above Middle C</td>
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<td>1 — Dubois-Laboreau Sonic Altimeter, 1932</td>
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### 1,000 CYCLES

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<td>25 — Low Range Brush Hypersonic Analyzer</td>
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<td>25 — Upper Range Components of Grasshopper Noise</td>
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<td>25 — Friction-Excited Vibrating Tubes by Holtmann</td>
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<tr>
<td>25 — Upper Limit Sonar QCS/T and QJA — Common Midrange of Bias for Magnetic Recording</td>
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<td>25 — Brown Cricket</td>
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<tr>
<td>25 — Small Meadow Grasshopper — Ultrasonic Garage-Door Opener</td>
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<tr>
<td>25 — Submarine Signal Co. Type 788A Magnetostriction Depth Sounder</td>
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<tr>
<td>25 — Early Magnetostriction Projector for Submarine Signals</td>
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<td>25 — Upper Range Flocculating Aerosols — Common Meadow Grasshopper</td>
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<td>25 — Brown Cricket</td>
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<td>25 — Lower Limit Echo Ranging Sonar QCS/T</td>
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### 1 CYCLE

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### LOWER LIMIT NORMAL HUMAN HEARING

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### SUBAUDIBLE

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**ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH**
Approximately 125 books relating to electronics and electronic applications that have been issued during the past year are grouped under the broad topical headings. Short annotations are given for each book.
Basic Mathematics for Radio Students—By F. M. Coburn, Duffs & Sons, London, England, 1946, 270 pages, $0.90. Fundamental ideas found most useful in radio calculations are clearly presented.

Calculus—By Frederick H. Miller, John Wiley & Sons, New York, 1946, 2nd ed., 416 pages, $3.50. This general college introduction to calculus methods has been revised slightly to conform with notation used in current college texts.


Pulsed Linear Networks—By Ernest Frank, McGraw-Hill Book Co., New York, 1945, 267 pages, $3.00. Numerous usually encountered linear circuits are analyzed by methods of classical calculus as a means of familiarizing engineers with this technique of dealing with circuit response to rectangular pulses.


Trigonometry—By H. K. Hughes and G. T. Miller, John Wiley & Sons, New York, 1946, 2nd ed., 125 pages, $2.50. This text is directed toward college freshmen.


ELECTRICAL ENGINEERING


Circuit Analysis by Laboratory Methods—By Carl E. Sneider and M. Stanley Holm, Prentice-Hall, New York, 1946, 288 pages, $3.35. This laboratory instruction manual is suitable for trade school and college freshman laboratory courses in d-c and a-c circuits.

Electrical Transmission in Steady State—By Paul J. Selig, McGraw-Hill Book Co., New York, 1946, 427 pages, $5.00. Fundamental concepts of power flow through linear networks on which basic circuits are analyzed, are examined. Examinations forTOP are included and deeper his grasp of his analytical tools.


ELECTRONICS


Electronics for Electricians and Radio Men—By The Technical Staff of Coyne Electrical School, Coyne Electrical School, Chicago, Ill., 1945, 426 pages. Material in this work is presented to give the technician a practical start into the industrial applications of electronics.

Electronics for Engineers—By John Markus and Vincent Zeff, McGraw-Hill Book Co., New York, 1945, 300 pages, $6.00. The 142 articles from ELECTRONICS that have been in greatest demand for their technical and practical aspects of electron optics and electron microscopy and Part II presents theoretical aspects of electron optics as encountered in the electron microscope. is presented for the technician a practical start into the industrial applications of electronics.

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Fundamentals of electronics are presented for the beginning technician.

Introduction to Electronics—By R. G. Hudson, Macmillan Co., New York, 1945, 537 pages, $3.00. Non-technical explanation of currently used equipment and systems is presented for operators.

Principles for Radio Operators—By Ralph Atherton, Macmillan Co., New York, 1945, 346 pages, $3.75. A grounding in practical fundamentals of components and circuits is provided by this well illustrated beginner's textbook.


Radio Sound Effects—By Joseph Kramer and William D. Hoffman, Ziff-Davis Publ. Co., New York-Chicago, 1945, 71 pages, $1.50. This syllabus introduces the reader to the practices and psychology of the subjects.


TELEVISION

American Television Directory, The 1946—Published by American Television Society, New York, First Annual Ed., 144 pages, $1.00. Advertising and programming aspects of television are summarized by some 50 authors active in the field.

Scribbling of Television Receivers, The—Published by Telefunke Corp., Philadelphia, Pa., 1946, 140 pages, $2.25. Stated after the well illustrated war-time instruction manuals, this maintenance book is directed toward receptionists and owners.


College Courses in ELECTRONICS

The colleges and universities listed below answered affirmatively when asked "do you offer courses in 'electronics' as distinct from courses in electrical engineering?"

ALABAMA
Alabama Polytechnic Institute, Auburn
University of Alabama, University

ARIZONA
Arizona State College, Tempe
University of Arizona, Tucson

ARKANSAS
University of Arkansas, Fayetteville

CALIFORNIA
California Institute of Technology, Pasadena
Stanford University, Stanford
University of California, Berkeley
University of Santa Clara, Santa Clara
University of Southern California, Los Angeles

COLORADO
University of Colorado, Boulder
University of Denver, Denver

CONNECTICUT
University of Connecticut, Storrs
Yale University, New Haven

DELAWARE
University of Delaware, Newark

DISTRICT OF COLUMBIA
Catholic University of America, Washington
George Washington University, Washington
Howard University, Washington

FLORIDA
University of Florida, Gainesville

GEORGIA
Georgia School of Technology, Atlanta

IDAHO
University of Idaho, Moscow

ILLINOIS
University of Illinois, Urbana
Northwestern University, Evanston

INDIANA
Indiana Technical College, Fort Wayne
Purdue University, Lafayette
University of Notre Dame, Notre Dame

IOWA
Iowa State College, Ames
State University of Iowa, Iowa City

KANSAS
Kansas State College, Manhattan

KENTUCKY
University of Kentucky, Lexington

LOUISIANA
Louisiana State University, Baton Rouge
Southwestern Louisiana Institute, Lafayette
Tulane University, New Orleans

MAINE
University of Maine, Orono

MARYLAND
Johns Hopkins University, Baltimore
University of Maryland, College Park

MASSACHUSETTS
Harvard University, Cambridge
Massachusetts Institute of Technology, Cambridge
Northeastern University, Boston

MICHIGAN
Michigan State College, East Lansing
University of Michigan, Ann Arbor

MINNESOTA
University of Minnesota, Minneapolis

MISSISSIPPI
Mississippi State College, State College

MONTANA
Montana State College, Bozeman

NEW HAMPSHIRE
Dartmouth College, Hanover

NEW JERSEY
Stevens Institute of Technology, Hoboken

NEW MEXICO
University of New Mexico, Albuquerque

NEW YORK
Clarkson College of Technology, Potsdam
Columbia University, New York City
Cornell University, Ithaca
New York University, New York City
Polytechnic Institute of Brooklyn, Brooklyn
Pratt Institute, Brooklyn
Rensselaer Polytechnic Institute, Troy

NORTH CAROLINA
Duke University, Durham
University of North Carolina, Raleigh

OHIO
Case School of Applied Science, Cleveland
Ohio Northern University, Ada
Ohio State University, Columbus
Ohio University, Athens

OKLAHOMA
Oklahoma A & M College, Stillwater

OREGON
Oregon State College, Corvallis

PENNSYLVANIA
Carnegie Institute of Technology, Pittsburgh
Drexel Institute, Philadelphia
Lehigh University, Bethlehem
Penn State College, State College
University of Pennsylvania, Philadelphia
Bucknell University, Lewisburg

RHODE ISLAND
Rhode Island State College, Kingston

SOUTH CAROLINA
University of South Carolina, Columbia

SOUTH DAKOTA
South Dakota School of Mines, Rapid City
South Dakota State College, Brookings

TENNESSEE
University of Tennessee, Knoxville
Vanderbilt University, Nashville

UTAH
University of Utah, Salt Lake City

VERMONT
University of Vermont, Burlington

VIRGINIA
University of Virginia, Charlottesville
Virginia Polytechnic Institute, Blacksburg

WASHINGTON
State College of Washington, Pullman
University of Washington, Seattle

WISCONSIN
University of Wisconsin, Madison

WYOMING
University of Wyoming, Laramie
A modern crystal rectifier consists of a small-area contact between a tungsten whisker and a suitable semiconductor. It should not be confused with copper-oxide or selenium rectifiers.

Developed as imperative components for microwave radar systems, the electrical characteristics and mechanical stability of the new crystal rectifiers make them attractive to designers of modern electronic equipment. Point-contact rectifiers offer many possibilities in addition to the present uses as microwave converters, second-detectors, beacon detectors and low-frequency diodes. They can replace many diodes with a saving in volume, weight, and filament power consumption. The low capacitance of the contact makes their use in uhf and shf applications desirable. Special kinds, such as welded-point crystals and silicon high-back voltage crystals, are capable of still further development and use.

The table at the top shows uses and major characteristics of most currently available crystals. Those registered with the RMA Data Bureau are designated by an asterisk. The radar band in which each was used has been indicated in column "x". After selecting a crystal type according to gross characteristics, the design engineer can find its exact characteristics in one of the two larger tables.

An analysis of physical composition; theory, and test procedures is given in an article, Crystal Rectifiers, by W. E. Stephens, ELECTRONICS, p 112, July 1946.

### Silicon and Germanium Rectifiers

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<th>1N21A</th>
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<td>Center freq. (mc)</td>
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<td>3,060</td>
<td>3,060±5</td>
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<td>Max. i-f impedance (ohms)</td>
<td>800</td>
<td>200</td>
<td>6.5</td>
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<tr>
<td>Min. i-f impedance (ohms)</td>
<td>6.5</td>
<td>1.5</td>
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<tr>
<td>Max. conversion loss (db)</td>
<td>0.5</td>
<td>0.5</td>
<td>400</td>
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<tr>
<td>R-f signal input (milliamp)</td>
<td>100±10</td>
<td>100±10</td>
<td>100±10</td>
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<tr>
<td>Mod. freq. load imp. (ohms)</td>
<td>400</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>D-c load resistance (ohms)</td>
<td>100±10</td>
<td>100±10</td>
<td>100±10</td>
</tr>
<tr>
<td>Max. output noise ratio</td>
<td>4.0</td>
<td>3.0</td>
<td>2.0</td>
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<tr>
<td>R-f signal input (milliamps)</td>
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<td>0.5</td>
<td>400</td>
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<tr>
<td>Reference resistance (ohms)</td>
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<td>D-c load resistance (ohms)</td>
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<td>100±10</td>
<td>100±10</td>
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<tr>
<td>Approx. rect. crystal current (ma)</td>
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### Video Rectifiers

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<th>1N29*</th>
<th>1N30*</th>
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<tr>
<td>Center freq. (mc)</td>
<td>3,295±40</td>
<td>3,060±5</td>
<td>9,375±30</td>
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<tr>
<td>Max. video freq. (mc)</td>
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<td>5.0</td>
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<tr>
<td>Min. video freq. (mc)</td>
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<td>500</td>
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<tr>
<td>Max. video impedance (ohms)</td>
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<td>21,000</td>
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<td>Max. forward voltage (millivolts)</td>
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<td>6,500</td>
<td>7,000</td>
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<td>Min. video impedance (ohms)</td>
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<tr>
<td>Max. forward voltage (millivolts)</td>
<td>50</td>
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<tr>
<td>Min. figure of merit</td>
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<tr>
<td>Max. r-f power input (microwatts)</td>
<td>5</td>
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<tr>
<td>Crystal circuit constant (ohms)</td>
<td>1,200</td>
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<td>Max. conversion loss (db)</td>
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<td>R-f signal input power (milliamps)</td>
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<td>Reference resistance (ohms)</td>
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<tr>
<td>D-c load resistance (ohms)</td>
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<td>Rectified crystal current (ma)</td>
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### USES AND MAJOR CHARACTERISTICS

#### FUNCTIONS AND CHARACTERISTICS

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<tr>
<th>TYPE NUMBERS</th>
<th>Converter</th>
<th>Video</th>
<th>Diode</th>
<th>Instrument Rectifier</th>
<th>2nd Detector</th>
<th>Least Sensitive</th>
<th>Moderate Sensitivity</th>
<th>High Sensitivity</th>
<th>Most Sensitive</th>
<th>High Burnout</th>
<th>Medium High Burnout</th>
<th>High Back Voltage</th>
<th>D-C Resistor</th>
<th>% (cm)</th>
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### CONVERTER RECTIFIERS

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<th></th>
<th>1N21 C</th>
<th>1N23</th>
<th>1N23 A</th>
<th>1N23 B*</th>
<th>1N24 (obs)</th>
<th>1N25*</th>
<th>1N26*</th>
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<td>9,375</td>
<td>9,375 ±30</td>
<td>24,000</td>
<td>1,000 ±10</td>
<td>24,000 ±60</td>
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<tr>
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<td>200</td>
<td>100 ±10</td>
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### DIODE RECTIFIERS

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</table>

Note: The 1N35 consists of two 1N34's mounted together.
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and their officers

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# KENYON "T" LINE TRANSFORMERS

## LOW IMPEDANCE SOURCE TO GRID TRANSFORMERS

<table>
<thead>
<tr>
<th>Type No.</th>
<th>From</th>
<th>Primary Ohms</th>
<th>Secondary Ohms</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-25 (Hum bucking type)</td>
<td>S.B. or D.B. Misc.</td>
<td>500-200-50</td>
<td>80,000 Single Grid</td>
<td>1A</td>
<td>1 lb. 4 oz.</td>
<td>$7.30</td>
</tr>
<tr>
<td>T-26 (Hum bucking type)</td>
<td>Any line</td>
<td>500-333-250-200-125-50</td>
<td>80,000 Single Grid</td>
<td>1A</td>
<td>1 lb. 4 oz.</td>
<td>$7.30</td>
</tr>
<tr>
<td>T-28</td>
<td>Any line</td>
<td>500-333-250-200-125-50</td>
<td>80,000 Single Grid</td>
<td>1A</td>
<td>1 lb. 4 oz.</td>
<td>$7.30</td>
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## LINE-TRANSFORMERS—LINE TO LINE AND LINE TO VOICE COIL

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<th>Type No.</th>
<th>From</th>
<th>Secondary Ohms</th>
<th>Maximum Level</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
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<td>T-25</td>
<td>500-200-50</td>
<td>+24 D.B.</td>
<td>1A</td>
<td>1 lb. 10 oz.</td>
<td>$7.50</td>
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<tr>
<td>T-26 (Hum bucking type)</td>
<td>500-333-250-200-125-50</td>
<td>+24 D.B.</td>
<td>1A</td>
<td>1 lb. 10 oz.</td>
<td>$7.50</td>
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## INTERSTAGE AUDIO TRANSFORMERS

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<th>Type No.</th>
<th>From</th>
<th>To</th>
<th>Ratio</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
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</thead>
<tbody>
<tr>
<td>T-25</td>
<td>Single 10,000 ohm plate</td>
<td>Single Grid</td>
<td>1:4</td>
<td>1A</td>
<td>1 lb. 4 oz.</td>
<td>$5.65</td>
</tr>
<tr>
<td>T-26</td>
<td>Single 10,000 ohm plate</td>
<td>P.P. Grids</td>
<td>1:4</td>
<td>1A</td>
<td>1 lb. 4 oz.</td>
<td>$5.65</td>
</tr>
<tr>
<td>T-27</td>
<td>Single 10,000 ohm plate</td>
<td>Single Grid</td>
<td>1:1.8</td>
<td>2A</td>
<td>1 lb. 14 oz.</td>
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<td>T-28</td>
<td>Single 10,000 ohm plate</td>
<td>Single Grid</td>
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<td>2A</td>
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<td>7.30</td>
</tr>
<tr>
<td>T-29 (Hum bucking type)</td>
<td>Single 10,000 ohm plate</td>
<td>Single Grid</td>
<td>1:2</td>
<td>2A</td>
<td>1 lb. 14 oz.</td>
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## DRIVER TRANSFORMERS

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<th>Type No.</th>
<th>Primary to match</th>
<th>Class AB or Class B Tubes</th>
<th>Ratio (pri. to 3/4 Sec.)</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
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<tbody>
<tr>
<td>T-251</td>
<td>Single 5S, 6AS, 6N7, 56, 6C5</td>
<td>55, 6AJ, 6N7</td>
<td>2.2:1</td>
<td>2A</td>
<td>1 lb. 10 oz.</td>
<td>$5.65</td>
</tr>
<tr>
<td>T-252</td>
<td>Single 5S, 6AS, 6N7</td>
<td>40'9', 59'6', 6F6's</td>
<td>1.7:1</td>
<td>1A</td>
<td>1 lb. 14 oz.</td>
<td>4.95</td>
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<td>T-253</td>
<td>Single 46, 59</td>
<td>6L6's</td>
<td>2.3:1</td>
<td>2A</td>
<td>1 lb. 14 oz.</td>
<td>5.65</td>
</tr>
<tr>
<td>T-255</td>
<td>P.P. 5S, 6C5, 56, 6N7</td>
<td>354E's, 354F's</td>
<td>2.1:1</td>
<td>2A</td>
<td>1 lb. 14 oz.</td>
<td>5.65</td>
</tr>
<tr>
<td>T-267</td>
<td>P.P. 48, 2A3's, 6F6's</td>
<td>6L6's, 89'6', T430's</td>
<td>5.7:1</td>
<td>2A</td>
<td>1 lb. 14 oz.</td>
<td>5.65</td>
</tr>
</tbody>
</table>

## PREAMPLIFIER OUTPUT TRANSFORMERS

<table>
<thead>
<tr>
<th>Type No.</th>
<th>From</th>
<th>Secondary Ohms</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-101</td>
<td>Single 56, 76, 6C5</td>
<td>200-500</td>
<td>1A</td>
<td>1 lb. 4 oz.</td>
<td>$5.65</td>
</tr>
<tr>
<td>T-102</td>
<td>P.P. 56, 76, 6C5</td>
<td>200-500</td>
<td>1A</td>
<td>1 lb. 4 oz.</td>
<td>$5.65</td>
</tr>
</tbody>
</table>

## OUTPUT TRANSFORMERS TO 500-200 OR 15-8-4 OHMS

<table>
<thead>
<tr>
<th>Type No.</th>
<th>From</th>
<th>Primary Ohms</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-184</td>
<td>Single 2A5, 6F6, 42, 47, 89</td>
<td>7,000</td>
<td>2A</td>
<td>1 lb. 14 oz.</td>
<td>$6.65</td>
</tr>
<tr>
<td>T-317</td>
<td>&quot;A&quot;, &quot;B&quot; P.P. 6L6's</td>
<td>6,600 or 3,800</td>
<td>4A</td>
<td>4 lb. 8 oz.</td>
<td>11.85</td>
</tr>
<tr>
<td>T-319</td>
<td>&quot;A&quot;, &quot;B&quot; P.P. 6L6's, Class AB 45's, 2A3's</td>
<td>6,300 or 3,300</td>
<td>4A</td>
<td>4 lb. 8 oz.</td>
<td>11.85</td>
</tr>
<tr>
<td>T-301</td>
<td>Class &quot;A&quot;, P.P. 6L6's, Class AB 45's, 2A3's</td>
<td>5,000 or 3,000</td>
<td>4A</td>
<td>4 lb. 8 oz.</td>
<td>9.95</td>
</tr>
</tbody>
</table>
KENYON "T" LINE TRANSFORMERS

KEN-O-DYNE UNIVERSAL OUTPUT TRANSFORMERS

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-168</td>
<td>3A</td>
<td>2 lbs. 13 ozs.</td>
<td>12.95</td>
</tr>
<tr>
<td>T-169</td>
<td>4A</td>
<td>5 lbs. 2 ozs.</td>
<td>12.95</td>
</tr>
<tr>
<td>T-110</td>
<td>5A</td>
<td>10 lbs. 1 oz.</td>
<td>15.95</td>
</tr>
</tbody>
</table>

Will match any set of Push-Pull or Push-Pull Parallel or a single plate to 500-200 or speaker voice-coils. Low impedance connection for speaker voice coils range from 5 to 30 ohms.

KEN-O-TAP MODULATION TRANSFORMERS

Ken-o-Tap Transformers never grow obsolete! Ideal for amateurs who wish to keep up to date with new tube combinations.

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Audio Output</th>
<th>Case &quot;C&quot;</th>
<th>Secondary Range</th>
<th>Primary Range</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-489</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-493</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-494</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-495</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-496</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PLATE TRANSFORMERS FOR STANDARD AMATEUR DUTY

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Secondary Volts</th>
<th>D.C. Volts</th>
<th>D.C. M.A.</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-668</td>
<td>1000/750-0-750</td>
<td>500</td>
<td>300</td>
<td>5A</td>
<td>10 lbs. 10 ozs.</td>
<td>21.20</td>
</tr>
<tr>
<td>T-669</td>
<td>1460/1150-0-1150</td>
<td>1000/1150</td>
<td>300</td>
<td>5A</td>
<td>9 lbs. 10 ozs.</td>
<td>18.70</td>
</tr>
<tr>
<td>T-670</td>
<td>2360-0-2360/1760</td>
<td>350/700</td>
<td>500</td>
<td>5A</td>
<td>8 lbs. 9 ozs.</td>
<td>16.25</td>
</tr>
<tr>
<td>T-671</td>
<td>1460/1150-0-1150</td>
<td>1000/1150</td>
<td>500</td>
<td>5A</td>
<td>7 lbs. 9 ozs.</td>
<td>15.95</td>
</tr>
</tbody>
</table>

PLATE TRANSFORMERS FOR HEAVY AMATEUR DUTY

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Primary Const.</th>
<th>SECONIDEO NO. 1 VOLTS</th>
<th>M.A. D.C.</th>
<th>SECONIDEO NO. 2 VOLTS</th>
<th>M.A. D.C.</th>
<th>SECONIDEO NO. 3 VOLTS</th>
<th>M.A. D.C.</th>
<th>Standard - Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-664</td>
<td>600</td>
<td>740-0-740</td>
<td>150</td>
<td>750</td>
<td>150</td>
<td>700</td>
<td>150</td>
<td>500/750</td>
<td>300</td>
<td>200</td>
</tr>
</tbody>
</table>

All power transformers are designed for 115 volt, 50 to 60 cycle operation. For any other voltage 50 to 60 cycle operation add 25% to list prices. For any other voltage 25 cycle operation add 60% to list prices. Case sizes for 25 cycle application are different from those specified for standard 115 volt 50 to 60 cycle operation.

KENYON TRANSFORMER COMPANY, INC.,

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
### Filter Reactors

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Inductance (M. A.)</th>
<th>D.C. Resistance</th>
<th>Insulation Test</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-155</td>
<td>290</td>
<td>10</td>
<td>4700</td>
<td>1000 V</td>
<td>2A</td>
<td>$3.65</td>
</tr>
<tr>
<td>T-156</td>
<td>30</td>
<td>25</td>
<td>800</td>
<td>1000 V</td>
<td>1A</td>
<td>4.30</td>
</tr>
<tr>
<td>T-157</td>
<td>20</td>
<td>50</td>
<td>200</td>
<td>1000 V</td>
<td>1A</td>
<td>5.15</td>
</tr>
<tr>
<td>T-153</td>
<td>26</td>
<td>90</td>
<td>350</td>
<td>1000 V</td>
<td>1A</td>
<td>6.65</td>
</tr>
<tr>
<td>T-154</td>
<td>15</td>
<td>162</td>
<td>210</td>
<td>1000 V</td>
<td>1A</td>
<td>6.65</td>
</tr>
<tr>
<td>T-161</td>
<td>25</td>
<td>225</td>
<td>100</td>
<td>4A</td>
<td>10 lbs.</td>
<td>9.30</td>
</tr>
<tr>
<td>T-162</td>
<td>20</td>
<td>250</td>
<td>100</td>
<td>4A</td>
<td>10 lbs.</td>
<td>9.30</td>
</tr>
<tr>
<td>T-164</td>
<td>14</td>
<td>250</td>
<td>135</td>
<td>5A</td>
<td>10 lbs.</td>
<td>12.95</td>
</tr>
<tr>
<td>T-166</td>
<td>14</td>
<td>300</td>
<td>125</td>
<td>5A</td>
<td>10 lbs.</td>
<td>12.95</td>
</tr>
<tr>
<td>T-167</td>
<td>12</td>
<td>500</td>
<td>77</td>
<td>6A</td>
<td>15 lbs.</td>
<td>15.95</td>
</tr>
<tr>
<td>T-168</td>
<td>10</td>
<td>150</td>
<td>275</td>
<td>5A</td>
<td>10 lbs.</td>
<td>12.95</td>
</tr>
<tr>
<td>T-169</td>
<td>15</td>
<td>300</td>
<td>900</td>
<td>5A</td>
<td>10 lbs.</td>
<td>17.95</td>
</tr>
<tr>
<td>T-161</td>
<td>12</td>
<td>450</td>
<td>65</td>
<td>5A</td>
<td>10 lbs.</td>
<td>23.95</td>
</tr>
<tr>
<td>T-164</td>
<td>10</td>
<td>600</td>
<td>50</td>
<td>7A</td>
<td>21 lbs.</td>
<td>27.60</td>
</tr>
</tbody>
</table>

### Swinging Reactors

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Inductance (M. A.)</th>
<th>D.C. Resistance</th>
<th>Insulation Test</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-517</td>
<td>15-45</td>
<td>90-20</td>
<td>550</td>
<td>1000 V</td>
<td>3A</td>
<td>2 lbs. 12 oz.</td>
</tr>
<tr>
<td>T-515</td>
<td>10-25</td>
<td>65-20</td>
<td>210</td>
<td>1000 V</td>
<td>3A</td>
<td>2 lbs. 2 oz.</td>
</tr>
<tr>
<td>T-506</td>
<td>5-20</td>
<td>100-200</td>
<td>100</td>
<td>1000 V</td>
<td>4A</td>
<td>2 lbs. 10 oz.</td>
</tr>
<tr>
<td>T-501</td>
<td>5-15</td>
<td>250-300</td>
<td>100</td>
<td>1000 V</td>
<td>4A</td>
<td>5 lbs. 10 oz.</td>
</tr>
<tr>
<td>T-516</td>
<td>6-19</td>
<td>300-300</td>
<td>100</td>
<td>1500 V</td>
<td>5A</td>
<td>10 lbs. 1 oz.</td>
</tr>
<tr>
<td>T-502</td>
<td>6-18</td>
<td>500-500</td>
<td>77</td>
<td>1500 V</td>
<td>6A</td>
<td>13 lbs. 9 oz.</td>
</tr>
<tr>
<td>T-509</td>
<td>6-19</td>
<td>200-300</td>
<td>140</td>
<td>5000 V</td>
<td>4A</td>
<td>5 lbs. 10 oz.</td>
</tr>
<tr>
<td>T-512</td>
<td>5-15</td>
<td>300-400</td>
<td>110</td>
<td>5000 V</td>
<td>5A</td>
<td>10 lbs. 1 oz.</td>
</tr>
<tr>
<td>T-513</td>
<td>5-18</td>
<td>400-500</td>
<td>70</td>
<td>5000 V</td>
<td>6A</td>
<td>12 lbs. 2 oz.</td>
</tr>
<tr>
<td>T-521</td>
<td>6-21</td>
<td>500-600</td>
<td>95</td>
<td>5000 V</td>
<td>7A</td>
<td>21 lbs. 1 oz.</td>
</tr>
<tr>
<td>T-505</td>
<td>5-17</td>
<td>600-600</td>
<td>50</td>
<td>5000 V</td>
<td>7A</td>
<td>21 lbs. 4 oz.</td>
</tr>
<tr>
<td>T-516</td>
<td>5-20</td>
<td>400-500</td>
<td>80</td>
<td>3000 V</td>
<td>6A</td>
<td>15 lbs. 9 oz.</td>
</tr>
</tbody>
</table>

### Plate and Filament Transformers

<table>
<thead>
<tr>
<th>Type No.</th>
<th>High Voltage — Volts M.A.</th>
<th>Filament No. 1 Amps</th>
<th>Volts A.C.</th>
<th>Filament No. 2 Amps</th>
<th>Filament No. 3 Amps</th>
<th>Filament No. 4 Amps</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-249</td>
<td>235-0-200</td>
<td>20</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>2A</td>
<td>2 lbs.</td>
<td>$6.65</td>
</tr>
<tr>
<td>T-245</td>
<td>320-0-225</td>
<td>25</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>2A</td>
<td>2 lbs.</td>
<td>$6.65</td>
</tr>
<tr>
<td>T-305</td>
<td>400-0-350</td>
<td>30</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>3A</td>
<td>2 lbs.</td>
<td>$8.55</td>
</tr>
<tr>
<td>T-206*</td>
<td>225-0-225</td>
<td>100</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>5A</td>
<td>9 lbs.</td>
<td>$13.40</td>
</tr>
<tr>
<td>T-212</td>
<td>420-0-420</td>
<td>125</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>5A</td>
<td>9 lbs.</td>
<td>$14.40</td>
</tr>
<tr>
<td>T-234</td>
<td>425-0-425</td>
<td>155</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6A</td>
<td>11 lbs.</td>
<td>$19.45</td>
</tr>
<tr>
<td>T-211</td>
<td>500-80-520</td>
<td>180</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6A</td>
<td>11 lbs.</td>
<td>$19.45</td>
</tr>
<tr>
<td>T-215</td>
<td>600-120-660</td>
<td>200</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>7A</td>
<td>11 lbs.</td>
<td>$21.95</td>
</tr>
<tr>
<td>T-216</td>
<td>820-80-520</td>
<td>250</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>7A</td>
<td>11 lbs.</td>
<td>$21.95</td>
</tr>
<tr>
<td>T-228*</td>
<td>125-0-125</td>
<td>200</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>7A</td>
<td>11 lbs.</td>
<td>$19.45</td>
</tr>
<tr>
<td>T-244</td>
<td>625-0-625</td>
<td>250</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>8A</td>
<td>11 lbs.</td>
<td>$21.95</td>
</tr>
<tr>
<td>T-221</td>
<td>650-600</td>
<td>300</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>6.3 C.T.</td>
<td>0.6</td>
<td>8A</td>
<td>11 lbs.</td>
<td>$21.95</td>
</tr>
</tbody>
</table>

* Indicates unit designed for condenser input. (All other units should be used choice input.)

### Power Line Auto Transformers

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Input</th>
<th>Output</th>
<th>Capacity Volt-Ampere</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-219</td>
<td>88-120</td>
<td>115</td>
<td>500</td>
<td>5A</td>
<td>10 lbs.</td>
<td>$17.10</td>
</tr>
</tbody>
</table>

### Filament Transformers

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-388</td>
<td>1A</td>
<td>1 lb. 7 oz.</td>
<td>$4.75</td>
</tr>
<tr>
<td>T-379</td>
<td>1A</td>
<td>1 lb. 6 oz.</td>
<td>5.85</td>
</tr>
<tr>
<td>T-352</td>
<td>2A</td>
<td>1 lb. 14 oz.</td>
<td>5.70</td>
</tr>
<tr>
<td>T-386</td>
<td>3A</td>
<td>2 lbs. 13 oz.</td>
<td>7.90</td>
</tr>
<tr>
<td>T-384</td>
<td>4A</td>
<td>4 lbs. 14 oz.</td>
<td>11.75</td>
</tr>
</tbody>
</table>

### 840 Barry Street

**New York 59, N. Y.**

ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH
### Filament Transformers

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-396</td>
<td>5 V.-20 A. C.T.</td>
<td>10000 V. Test</td>
<td>$21.90</td>
</tr>
<tr>
<td>T-351</td>
<td>6.3 V.-3 A. C.T.</td>
<td>2000 V. Test</td>
<td>3A 1 lb. 13 ozs. 5.35</td>
</tr>
<tr>
<td>T-378</td>
<td>6.3, 7.5 V.-7 A. C.T.</td>
<td>2000 V. Test</td>
<td>3A 2 lbs. 13 ozs. 6.35</td>
</tr>
<tr>
<td>T-387</td>
<td>6.3, 6.45, 6.6 V.-8 A. C.T.</td>
<td>2000 V. Test</td>
<td>3A 2 lbs. 13 ozs. 6.35</td>
</tr>
<tr>
<td>T-392</td>
<td>7.5, 7.7, 7.9 V.-6 A. C.T.</td>
<td>2000 V. Test</td>
<td>3A 2 lbs. 13 ozs. 6.35</td>
</tr>
<tr>
<td>T-353</td>
<td>7.5 V.-45 A. C.T.</td>
<td>2000 V. Test</td>
<td>3A 2 lbs. 13 ozs. 6.35</td>
</tr>
<tr>
<td>T-359</td>
<td>7.5 V.-9 A. C.T.</td>
<td>2000 V. Test</td>
<td>3A 2 lbs. 13 ozs. 6.35</td>
</tr>
<tr>
<td>T-365</td>
<td>10 V.-4 A. C.T.</td>
<td>5000 V. Test</td>
<td>3A 2 lbs. 13 ozs. 6.35</td>
</tr>
<tr>
<td>T-361</td>
<td>10 V.-8 A. C.T.</td>
<td>5000 V. Test</td>
<td>4A 5 lbs. 8.85</td>
</tr>
<tr>
<td>T-384</td>
<td>10, 10.5, 11 V.-5 A. C.T.</td>
<td>2000 V. Test</td>
<td>4A 5 lbs. 8.85</td>
</tr>
<tr>
<td>T-388</td>
<td>10, 10.5, 11 V.-10 A. C.T.</td>
<td>2000 V. Test</td>
<td>5A 8 lbs. 15 ozs. 12.70</td>
</tr>
</tbody>
</table>

### Two Windings

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-386</td>
<td>6.3 V.-3 A. C.T.</td>
<td>2000 V. Test</td>
<td>3A 2 lbs. 13 ozs. 6.95</td>
</tr>
<tr>
<td>T-389</td>
<td>2.5 V.-8 A. C.T.</td>
<td>1000 V. Test</td>
<td>4A 4 lbs. 11 ozs. 8.85</td>
</tr>
<tr>
<td>T-368</td>
<td>6.3 C.-4 A. C.T.</td>
<td>2000 V. Test</td>
<td>4A 4 lbs. 11 ozs. 8.85</td>
</tr>
<tr>
<td>T-366</td>
<td>2.5 V.-10 A. C.T.</td>
<td>5000 V. Test</td>
<td>4A 5 lbs. 10 ozs. 11.10</td>
</tr>
</tbody>
</table>

### Three Windings

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-376</td>
<td>6.3 V.-4 A. C.T.</td>
<td>2000 V. Test</td>
<td>4A 5 lbs. 10 ozs. 10.15</td>
</tr>
<tr>
<td>T-386</td>
<td>6.3 V.-3 A. C.T.</td>
<td>2000 V. Test</td>
<td>4A 5 lbs. 10 ozs. 10.15</td>
</tr>
<tr>
<td>T-375</td>
<td>5 V.-3 A. C.T.</td>
<td>4000 V. Test</td>
<td>5A 10 lbs. 1 oz. 13.65</td>
</tr>
</tbody>
</table>

### Four Windings

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-367</td>
<td>6.3 V.-5 A. C.T.</td>
<td>2000 V. Test</td>
<td>5A 10 lbs. 1 oz. 13.65</td>
</tr>
</tbody>
</table>

### Five Windings

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Case No.</th>
<th>Weight</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-377</td>
<td>5 V.-3 A. C.T.</td>
<td>2000 V. Test</td>
<td>5A 10 lbs. 1 oz. 15.20</td>
</tr>
</tbody>
</table>

### Telescopic Shielded Humbacking Transformers

The core type, humbacking, construction employed in these transformers tends to minimize hum pick-up. In addition, they are mounted in multiple electromagnetic shields of high permeability alloy steel which are annealed after complete construction to remove shearing and bending strains thus assuring maximum permeability upon which depends the efficiency of shielding.

**Type P-202**
- Designed for multiple line primary of 500/333/250/200/125/50 ohms and secondary of 50,000 ohms (single class A grid) having a frequency response of plus or minus 2 DB 30 to 15,000 cycles, shielding, 90 db mounted in four high permeability alloy annealed steel cases. Weight 1 lb.

**Type P-203**
- Has a primary and frequency response the same as Type P-202 above. Secondary: 100,000 ohms to P grid. Weight 1 lb.

**Type P-204**
- Has primary and secondary specifications same as P-202. Frequency response plus or minus 1 DB 30 to 20,000 cycles. Shielding, 90 DB. Weight 1 lb. 7 ozs.

**Type P-205**
- Has primary and secondary specifications same as P-203. Frequency response plus or minus 1 DB 30 to 20,000 cycles. Shielding, 90 DB. Weight 1 lb. 7 ozs.

**Type T-6**
- Designed with a multiple line primary of 500/333/250/200/125/50 ohms and secondary of 50,000 ohms (single class A grid). Frequency response plus or minus 3 db 60 to 10,000 cycles. Shielding, 50 db. Mounted in 2 high permeability annealed alloy steel cases and plain steel outer case. These units are designed for use in low level input circuits where hum pick-up must be kept to absolute minimum. Weight 1 lb. 7 ozs.

**We invite inquiries on "Special Units" for the electronic field and other commercial and industrial users. Address Dept. K-1**
### Instrument Function | Output Power (DBM) | Nominal Input Impedance | Load Impedance | Gain
--- | --- | --- | --- | ---
(A) Type 116-A | PLUG-IN Pre-amp, booster amplifier | +18 DBM | 30/150 C.T./250/600 C.T. Ohms | 150/600 C.T. Ohms | 40 db or 34 db
(B) Type 117-A | PLUG-IN program, monitor or booster amp. | +30 as program, +39 as monitor | 30/150 C.T./250/600 C.T. Ohms | 150/600 C.T. Ohms | 50 db
(C) Type 118-A | PLUG-IN Isolation, Bridging Amplifier | +24 DBM | Bridging | 600 Ohms (130 special order) | 6 db after a 6 db gain, will provide 75 db isolation and zero gain
(D) Type 102-A | Program, Amplifier | +28 DBM | 30/250/600 Ohms | 600 Ohms | 55 db, provision for 45, 35 db
(E) Type 106-A | Pre-amp or booster | +16 DBM | 30/250/600 Ohms | 600 Ohms | 38 db, provision for 28, 18 db
(F) Type 108 | Power, monitor, talk-back or buss amplifier | 20 watts (+43 DBM) | High Gain Input—20/250 Ohms | 500/8 Ohms | High Gain Input—102 db, Low Gain Input—61 db matching 600 Ohms, 42 db bridging 600 Ohms
(G) Type 111-C Type 111-D | Dual Pre-amp, or booster | +16 DBM | C-30/250/600 Ohms | D-150/600 Ohms | 47 db
(H) Type 121 | Power Amplifier | 50 watts (+47 DBM) | High Gain Input—20/250 Ohms | 600 Ohms | High Gain Input—102 db, Low Gain Input—61 db matching 75 db, 42 db bridging 600 Ohms
(I) Type 114-A | AC-DC Monitor, power, utility amplifier | 4 watts (+40 DBM) | 600 Ohms or Bridging | 600 Ohms | 61 db matching 600 Ohms, 43 db bridging 600 Ohms
(K) Type 201-A & B Power Supply | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at 280 V, 8 amperes at 6.3 V. The Type 201-B has additional filter stage providing 20 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(L) Type 119-A PROGAR | A fast acting Peak Limiter preceded by an automatic gain control amplifier with variable time constants. Resulting action of combination of amplifiers, in broadcast applications, is a higher percentage of modulation than can be obtained with a limiter alone. REG. U. S. PAT. OFF.
(M) Type 202-A Cabinet | Designed to house Langevin 108 series amplifiers (see item F). For shelf or wall mounting.
(N) Type 201-B | Power Supply | 8 amperes at 6.3 V. The Type 201-B has additional filter stage providing 30 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(O) Type 111-A & B Transformer | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(P) Type 102-B | Transformer | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(Q) Type 102-C | Transformer | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(R) Type 102-D | Transformer | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(S) Type 112-A | Transformer | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(T) Type 114-B | Transformer | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(U) Type 114-C | Transformer | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(V) Type 114-D | Transformer | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(W) Type 114-E | Transformer | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(X) Type 114-F | Transformer | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(Y) Type 114-G | Transformer | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at .02% ripple, 75 M.A. at .04% ripple.
(Z) Type 114-H | Transformer | Supplies plate and filament power for 102, 106, 111 and similar amplifiers. Max. output 25 M.A. at .02% ripple, 75 M.A. at .04% ripple.
POWERFUL NEWS!
SORENSEN SYSTEM NOW APPLIED TO DC VOLTAGE REGULATION

The Sorensen system of AC electronic voltage regulation provides quick, accurate response to even the smallest voltage change with a minimum wave distortion and a regulation accuracy of 1/2 of 1%.

Arrange now to receive your personal copy of the Sorensen electronics journal "Currently", published bi-monthly.

This same electronic regulation system has been incorporated into the Nobatron, providing a source of regulated DC voltage at currents and stabilities that, in the past, was available only with batteries.

This new source of stabilized DC voltage is obtainable in six standard models operating on a 95-125 AC source of 50 to 60 cycles.

Among the more important uses for Nobatrons are DC ammeter calibration in experimental and quality control laboratories, testing of components in the automotive and aircraft industries in battery-operated relays and in other applications where it is desirable to replace a battery to guarantee continuous regulated power supply.

GENERAL AC REGULATOR SPECIFICATIONS

<table>
<thead>
<tr>
<th>Input Voltage Range</th>
<th>95-125 (1 model)</th>
<th>190-250 (2 model)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output Voltage Range</td>
<td>110-120 (1 model)</td>
<td>220-240 (2 model)</td>
</tr>
<tr>
<td>Load Range</td>
<td>25-30,000 V.A.</td>
<td></td>
</tr>
<tr>
<td>Regulation Accuracy</td>
<td>1/2 of 1%</td>
<td></td>
</tr>
<tr>
<td>Harmonic Distortion</td>
<td>5% Max. (2% in &quot;S&quot; Models)</td>
<td></td>
</tr>
<tr>
<td>Input Frequency Range</td>
<td>50-70 cycles</td>
<td></td>
</tr>
<tr>
<td>Inductive Power Factor Range</td>
<td>Down to 0.7 P.F.</td>
<td></td>
</tr>
</tbody>
</table>

For standard voltage regulation, Sorensen Model 500 is a proven leader in its field—compact, accurate and dependable. This model typifies the Sorensen line of AC and Nobatron all-purpose voltage regulators. Let a Sorensen engineer help you with your next voltage regulation problem.

SORENSEN & COMPANY, INC.
375 FAIRFIELD AVENUE • STAMFORD, CONNECTICUT
CONTINUOUSLY SERVING
WITH
HIGHEST QUALITY CRYSTALS

HUNT crystals last longer and give better results

Precision crystals manufactured by The Hunt Corporation are your assurance of better results and longer life...the result of years of developing and making only the highest quality piezo electric crystal units.

Hunt Crystal Units are made from the finest Brazilian Quartz and made by some of the most experienced, skilled craftsmen in the business. The CR-7 shown here is one of many high stability, close tolerance, precision crystal units manufactured by Hunt.

MINIATURE TYPE CR-7 CRYSTAL UNIT
(Center illustration is actual size)
Hermatic sealed all metal holder.
Wire mounted plated crystals.
Average weight .077 oz., CAATC 1335.
Fundamental operation, AT cut crystal, to 22 MC.
Harmonic mode operation, AT cut crystal, to 110 MC.
Temperature coefficient:
± .003% from -35° C to +70° C.
± .005% from -55° C to +90° C.

For complete information on the high quality crystals you need, write us today. Send along the details of your circuit.
ESPY INSTRUMENTS
GIVE YOU CONTROL OVER YOUR TEST CONDITIONS

Research and development laboratories are finding that Espy equipment gives them convenient, dependable accuracy in the control of test variables. The exacting standards maintained in design, workmanship, and materials give you confidence in your test methods. Assure accurate, reliable results by standardizing on Espy Instruments for all your lab measurements.

MODEL P-11 REGULATED POWER SUPPLY
- continuously variable
- 0 to +400 v.d.c, 200 ma
- 0 to —150 v.d.c
- 6.3 v.a.c, 6 amperes
- 1.0% regulation
- metered output
- cabinet or rack mounting
- voltages available at both front and rear
- 105/125 v.a.c source
- $250.00 f.o.b. factory
- early delivery
- voltage connections isolated from ground
- SLO-DOWN circuit prevents initial voltage surge
- line and high voltage fuses on front panel

Model P-12 Regulated Power Supply
- 0 to +600 v. d-c
- 0 to 300 ma d-c
- other features same as Model P-11
- $375.00 f.o.b. factory

Model P-14 Regulated Power Supply
- ±200 to +1000 v. d-c
- 0 to 300 ma d-c
- other features same as Model P-11
- $550.00 f.o.b. factory

CUSTOM BUILT REGULATED POWER SUPPLIES

We specialize in custom designed power supplies for such applications as magnetron, klystron, X-ray, and television equipment. Ask for details of our regulated laboratory master power supply system.

MODEL G-21 AUDIO OSCILLATOR
- 10,20,000 cps
- 5w max. output
- 50v across 200 ohms
- 0.5% distortion
- 6 push button frequencies
- incremental dial
- less than 1% hum
- RC oscillator b.f.o. circuit
- cabinet or rack mounting
- ±3% frequency accuracy
- square wave output provided by toggle switch
- 105/125 v. a.c source
- output voltage maintained constant within 1.0 db
- $350.00 f.o.b. factory

ESPY RADIO and ELECTRONIC CORPORATION
1218 Lincoln Blvd., Santa Monica, California

Formerly AMERICAN Radio Co.
—engineered for Engineers—by SHURE

—the Sonodyne

NEW MOVING COIL DYNAMIC MICROPHONE

1. High output! 52 db below 1 volt per dyne per square centimeter.
2. Multi-Impedance Switch for Low, Medium, or High Impedance.
3. Wide-range Frequency Response, from 70 to 9000 c. p. s.
5. Functional design for improved Acoustical Performance—beautiful die-cast pearl gray case.
6. Ideal for public address, recording, communications, and similar applications.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>CABLE</th>
<th>CODE</th>
<th>LIST PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>“51”</td>
<td>20 ft.</td>
<td>RUSON</td>
<td>$31.00</td>
</tr>
</tbody>
</table>

—New Quiet Crystal Pickup Cartridge

A smooth-working, soft-riding, silent-tracking cartridge especially designed to overcome problems of surface noise and distortion in home phonographs, coin-operated machines, and in all other applications where shellac and Vinylite pressings are used. The W60A tracks with the low needle force of only 1 oz., yet has a 1.9 volt output. Special feature of the “SIXTY” is the protective guards for the detachable permanent-point needle, which is sapphire-tipped, or osmium-tipped. High needle compliance coupled with low needle force gives longer life to both needle and record.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>CASE</th>
<th>MIN. NEEDLE FORCE</th>
<th>VOLTAGE</th>
<th>SHPG. WGT.</th>
<th>CODE</th>
<th>LIST PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>W60A (Sapphire)</td>
<td>Aluminum</td>
<td>1 oz.</td>
<td>1.9</td>
<td>½ oz.</td>
<td>RUSIS</td>
<td>$7.50</td>
</tr>
<tr>
<td>W60B (Osmium)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RUSIB</td>
<td>$6.50</td>
</tr>
</tbody>
</table>

—the Versatex

THE NEW VERSATILE CRYSTAL MICROPHONE

1. Can be used by itself as a desk stand, on a floor stand, or in your hand.
2. High output with 7 ft. cable, 53 db below 1 volt per dyne per square centimeter.
4. Has special moisture-proofed crystal.
5. Heavy, rich maroon plastic case—eliminates shock hazard.
6. Contains R-F filter to prevent crystal burnout.
7. The cartridge unit is mounted in rubber to provide mechanical isolation from the case, so that the microphone may be handled or carried about without annoying mechanical noise pickup.

<table>
<thead>
<tr>
<th>MODEL</th>
<th>CABLE</th>
<th>OUTPUT</th>
<th>CODE</th>
<th>LIST PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>718A</td>
<td>7-ft.</td>
<td>53 db below 1 volt per dyne per sq. cm.</td>
<td>RUTEX</td>
<td>$10.00</td>
</tr>
</tbody>
</table>
Because of their compactness, resistance to shock and vibration, and elimination of heater supplies, Sylvania Crystal Diodes have found widespread use in many types of circuits.

Germanium Crystal Diodes are used as second detectors and DC restorers in television receivers and frequency discriminators in FM sets, as well as in many other applications up to several hundred Mc.

Silicon Crystal Converters are used as first detectors in superheterodyne receivers. Silicon Video Detector Crystals may be used for detection in video or RF amplifiers.

---

### HYDROGEN THYRATRONS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>4C35</th>
<th>5C22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Peak Anode Voltage</td>
<td>+8000</td>
<td>+16000</td>
</tr>
<tr>
<td>Forward</td>
<td>500 ma</td>
<td>500 ma</td>
</tr>
<tr>
<td>Inverse</td>
<td>-8000</td>
<td>-16000</td>
</tr>
<tr>
<td>Maximum Anode Current Peak</td>
<td>100 ma</td>
<td>100 ma</td>
</tr>
<tr>
<td>Average</td>
<td>50 ma</td>
<td>50 ma</td>
</tr>
<tr>
<td>Heater Voltage</td>
<td>6.3 v</td>
<td>6.3 v</td>
</tr>
<tr>
<td>Heater Current</td>
<td>0.2 amp</td>
<td>0.2 amp</td>
</tr>
<tr>
<td>Max. Peak Grid Voltage</td>
<td>+200</td>
<td>+200</td>
</tr>
<tr>
<td>Max. Grid Current Rating Peak</td>
<td>50 ma</td>
<td>50 ma</td>
</tr>
<tr>
<td>Average</td>
<td>5.5 ma</td>
<td>5.5 ma</td>
</tr>
<tr>
<td>Min. Cathode Heating Time</td>
<td>3 min.</td>
<td>3 min.</td>
</tr>
<tr>
<td>Pulse Rating</td>
<td>50 µsec</td>
<td>50 µsec</td>
</tr>
<tr>
<td>Max. Time</td>
<td>4 µsec</td>
<td>4 µsec</td>
</tr>
<tr>
<td>Min. Repetition</td>
<td>4000 pps</td>
<td>4000 pps</td>
</tr>
</tbody>
</table>

(1) Max. permissible repetition rate is a function of peak forward anode voltage and peak anode current, according to formula: 2.8 x 10^(-5) pf = npy x 1/(Io)

---

### TRIGGER TUBES AND STROBOTRONS

Sylvania Trigger tubes OAS is a 5-element, inert gas filled, cold cathode tube specially designed for electronic relay applications. Time required to initiate the arc and deionization time are extremely short.

Strobotrons, primarily designed for visual studies, may also be used as electronic relays.

---

### Sylvania Hydrogen Thytratrons 4C35 and 5C22

These tubes are the short deionization type, which permits an unusually high switching rate. Ambient temperatures over a wide range have little effect on their electrical properties.

Characteristics of the 4C35 and 5C22 are listed in table at left. Detailed technical information on other types of thyatrons is available on request from Sylvania Electric.

---

### SELENIUM RECTIFIERS

The Type NCS Selenium Rectifier is a compact, rugged, lightweight, heaterless, metallic type rectifier. It was developed for a wide variety of rectifier applications, especially in the power supplies of radio receivers. It incorporates between two metallic contact surfaces a chemically and electrically treated selenium layer which permits current flow in one direction but blocks it in the other, thus rectifying the applied AC.

---

### ELECTRICAL RATINGS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>130 v</th>
<th>390 v</th>
<th>1200 ma</th>
<th>100 ma</th>
<th>5 v</th>
<th>75°C</th>
<th>20 ohms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Allowable RMS Voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Allowable Inverse Voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Allowable Peak Current</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Allowable DC Output Current</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approx. Rectifier Voltage Drop</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. Operating Temperature</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. Peak-current Limiting Resistor</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Polarity-Cathode is marked &quot;CATH&quot;</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

---

### TRIGGER TUBE CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>750 v</th>
<th>130 v</th>
<th>0.25 ma</th>
<th>50 µa</th>
<th>85 v</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anode Voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger Grid Bias</td>
<td>+190 v</td>
<td>+190 v</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger Grid Resistance</td>
<td>0.25 ma</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharge Condenser</td>
<td>50 µa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keep-alive Current</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger Pulse Voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### STROBOTRON CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>SN4</th>
<th>ID21</th>
<th>SN4</th>
<th>ID21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Pulse Rate</td>
<td>60</td>
<td>240</td>
<td>60</td>
<td>240</td>
</tr>
<tr>
<td>Discharge Capacity</td>
<td>2 µf</td>
<td>2 µf</td>
<td>2 µf</td>
<td>2 µf</td>
</tr>
<tr>
<td>Max. Anode Voltage</td>
<td>350 v</td>
<td>350 v</td>
<td>350 v</td>
<td>350 v</td>
</tr>
<tr>
<td>Max. Avg. Anode Current</td>
<td>50 ma</td>
<td>50 ma</td>
<td>50 ma</td>
<td>50 ma</td>
</tr>
<tr>
<td>Max. Peak Anode Current</td>
<td>5 amp</td>
<td>5 amp</td>
<td>5 amp</td>
<td>5 amp</td>
</tr>
<tr>
<td>DC Volts Max.</td>
<td>70</td>
<td>15 ma</td>
<td>15 ma</td>
<td>15 ma</td>
</tr>
</tbody>
</table>

STROBOTRON R4550 is a polychromatic strobotron, capable of giving brilliant flashes of white light. It is therefore especially useful in observing any periodic motion involving color, such as color printing. In a suitable circuit, repetition rates as high as hundreds of flashes per second may be obtained. Duration of each flash is of the order of a few hundred-thousandths of a second.
**SYLVANIA ELECTRONIC TUBES**

**GEIGER-MUELLER TUBES**

The Sylvania Types GB-302 and GG-304 are counter tubes of stable, uniform characteristics, manufactured by vacuum tube production techniques. Other features include long life, dependability and convenience.

GB-302 is a beta-ray counter, utilizing a thin but rugged window of metal foil. It is extremely sensitive to the beta radiation of the majority of available radioactive isotopes. Useful in tracer techniques and in medical diagnostic and therapeutic applications.

GG-304 is the gamma-ray counter, companion to the GB-302. Useful in radiological safety surveys and other applications where gamma radiation must be efficiently measured. Also used for cosmic ray studies.

**SYLVANIA FLASH TUBES**

Sylvania Flash Tubes, used with suitable equipment, provide brilliant flashes of blue-white light of extremely short duration. Developed primarily for photographic purposes, Flash Tubes are also used in beacons, obstruction markers and signaling devices.

Illustrated at left: Type R4340

**GLOW MODULATOR TUBES**

Light output of Glow Modulator Tubes R1130B and R1131 varies in an essentially linear manner with the current passing through the tube. Tubes are of crater type, providing high ionization density.

Crater diameter of the R1130B is .050 inch; of the R1130, .093 inch. In other respects the tubes are identical.

- Operating Voltage: 140 volts max.
- Operating Current: 5-35 ma.
- Starting Voltage: 225 volts max.
- Modulating Frequency Range: 15-15,000 cps
- Useful Light Range: 3500-6500 A-
- Filament Voltage: None: cold cathode

**PIRANI AND THERMOCOUPLE TUBES**

Sylvania Pirani Tube R1111 and Thermocouple Tube R1100, used with suitable auxiliary apparatus, provide a means for direct measurement of gas pressures over a range from about 10^-1 to 10^-3 mm. With proper care, readings with an accuracy of ± 5% can be obtained.

**ELECTRICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>R1111</th>
<th>R1100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance (cold)</td>
<td>6.6 ohms</td>
<td>6.6 ohms</td>
</tr>
<tr>
<td>Resistance (hot—evacuated)</td>
<td>15.5-17.0 ohms</td>
<td>15.5-17.0 ohms</td>
</tr>
<tr>
<td>Operating Voltage</td>
<td>1.5 volts</td>
<td>1.5 volts</td>
</tr>
<tr>
<td>Thermocouple Resistance (max.)</td>
<td>3.0 ohms</td>
<td>5.0 ohms</td>
</tr>
<tr>
<td>Thermocouple Resistance (max.)</td>
<td>5.0 ohms</td>
<td>5.0 ohms</td>
</tr>
<tr>
<td>Thermocouple Current (max.)</td>
<td>125 ma</td>
<td>125 ma</td>
</tr>
<tr>
<td>Thermocouple Current (max.)</td>
<td>250 µA</td>
<td>250 µA</td>
</tr>
</tbody>
</table>

**ACCELEROMETER TUBES**

The accelerometer is a newly developed electronic tube useful in measuring linear acceleration. Operating range — 1 to 100 g's.

**OPERATING CHARACTERISTICS OF FLASH TUBES**

<table>
<thead>
<tr>
<th>Type</th>
<th>Forward Anode Voltage (min., max.)</th>
<th>Typical Operating Voltage</th>
<th>Max. No. of Flashes Per Min.</th>
<th>Max. Watt-sec. Per Flash</th>
<th>Trigger Supply Voltage (min.)</th>
<th>Light Output Peak Lumens</th>
</tr>
</thead>
<tbody>
<tr>
<td>R4330</td>
<td>2000 - 2500</td>
<td>2250</td>
<td>6</td>
<td>100</td>
<td>15,000</td>
<td>12,000,000</td>
</tr>
<tr>
<td>R4340</td>
<td>2000 - 2500</td>
<td>2250</td>
<td>4</td>
<td>400</td>
<td>15,000</td>
<td>12,000,000</td>
</tr>
</tbody>
</table>

**GAS DISCHARGE TUBES**

Gas Discharge Tubes are of the externally triggered cold cathode type. Capable of handling high instantaneous currents, they find wide use as electronic switches in high voltage circuits. A common use is as drivers and pulse generators for magnetostriction oscillators in underwater sound equipment.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>SS501</th>
<th>R4410</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Voltage</td>
<td>1800-3000</td>
<td>1900</td>
</tr>
<tr>
<td>Hold-Off (Breakdown) Voltage (min.)</td>
<td>2100</td>
<td>2000</td>
</tr>
<tr>
<td>Trigger Voltage (min.)</td>
<td>15,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Discharge Capacitance (max.)</td>
<td>2 μf</td>
<td>10 μf</td>
</tr>
<tr>
<td>Flashing Rate (max.)</td>
<td>12 pps</td>
<td>12 pps</td>
</tr>
</tbody>
</table>

**COPLANAR TRIODES**

Sylvania Coplanar Triodes utilize a radically new type of construction, involving a streamlined cathode assembly and planar grid. Advantages of the new design include higher efficiency, minimum interelectrode capacitances, minimum transit time effect, efficient operation up to 3000 Mc., maximum power output with minimum input power, and low heater drain.

No base is required for mounting these Coplanar Triodes. Inner conductor connects to heater; outer conductor to heater and cathode; straight disc to plate; and cupped disc to grid.

Detailed specifications on Type 2C36 triode oscillator, 2C37 general-purpose triode, and other tubes in this group may be obtained from Sylvania Electric.

**SYLVANIA ELECTRIC**

500 Fifth Avenue, New York 18, N. Y.
Sylvania Poly (MULTI-PURPOSE) Meter provides a convenient means of taking a wide variety of electrical measurements with a single compact instrument. Stabilized against errors caused by fluctuations in line voltage or by gas current in tubes. Complete with all accessories, including proximity-fuse type tube built into thumb-size probe for measurement of RF voltages.

SYLVANIA OSCILLOSCOPE

Sylvania's 3-inch cathode ray Oscilloscope Type 131 facilitates the solving of a wide variety of problems encountered in radio and electronic equipment. Controls are easily accessible and clearly marked. Lightweight visor permits use of the instrument in a lighted room. Leather carrying handle is provided for easy portability.

**SYLVANIA TEST EQUIPMENT**

<table>
<thead>
<tr>
<th>Property</th>
<th>P4 and P4E</th>
<th>5 and 5E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweep Speeds, line/sec.</td>
<td>0.5, 2.0, 6.0, and 25</td>
<td>0.5, 1.0, 5.0, and 50 and 100</td>
</tr>
<tr>
<td>Repetition rate of internal trigger generator,pps.</td>
<td>500, 1000, 2000, and 4000</td>
<td>500, 1000, 2000, and 4000</td>
</tr>
<tr>
<td>Sweep calibration</td>
<td>Provision for calibrating 0.5 and 2.0 µsec. sweep</td>
<td>None</td>
</tr>
<tr>
<td>Output Trigger (from internal trigger generator) for synchronizing external apparatus</td>
<td>Positive pulse of 1/15 v. peak, 1 µsec. rise time and 4 µsec. duration</td>
<td>Positive pulse rising to 200 v. peak in about 0.3 µsec. and maintaining an amplitude of at least 0.1 v. for 3 µsec.</td>
</tr>
<tr>
<td>Adjustable Delay of Output Trigger (with respect to start of sweep)</td>
<td>100 µsec. before to 1000 µsec. after start of sweep</td>
<td>75 µsec. before to 75 µsec. after start of sweep</td>
</tr>
<tr>
<td>Delay of Sweep Trigger (with respect to input trigger)</td>
<td>Adjustable 0 to 100 µsec.</td>
<td>Fixed 90 µsec.</td>
</tr>
<tr>
<td>Vertical Deflection Sensitivity</td>
<td>About 55 v./in. on 5-in. cathode ray tube SLP1</td>
<td>About 65 v./in. on 5-in. cathode ray tube SLP1</td>
</tr>
<tr>
<td>Line Supply</td>
<td>115 v. 60 cps 1P4: 190 watts P4E: 169 watts</td>
<td>115 v. 60 cps 5E: 239 watts</td>
</tr>
</tbody>
</table>

Sylvania Synchrosopes consist of a cathode-ray oscilloscope with a fast sweep generator for viewing short video pulses, and means for synchronizing the sweep with the equipment undergoing test. Originally developed for radar, these Sylvania instruments have many other applications in such fields as television and pulse-time-modulation communications.

Four models: Model 5, SE, P4, and P4E. "E" models incorporate RF detector and video amplifier, for direct examination of envelope of RF pulses or waveforms up to and including microwave region.

**RECORDING DILATOMETER**

The Sylvania Dilatometer (illustrated at right) combines the extreme accuracy in measuring expansion and contraction provided by the concentric quartz tube principle, with automatic recording of the measurements. Measurements are plotted in the form of a complete elongation-temperature curve for an entire 8-hour cycle. No special attention is required to operate.

Cabinet size for Models-5 and 5E is 16½" high by 15¾" wide by 22¾" deep. Weight is 110 pounds. Corresponding dimensions for Models P4 and P4E are 14½" by 9" by 21", weight 45 pounds.
LOCK-IN RECEIVING TUBES

In Sylvania Lock-In receiving tubes, the contact pins are sealed into the glass bottom, thus eliminating the need for soldered connections. No top cap connections are used—a feature which contributes to compactness. Many Lock-In types are especially suitable for UHF applications, because of their low lead inductances, low interelectrode capacitances and low dielectric losses.

Lower portion of the tube is fitted with a metal shell and guide pin. This unit acts as a shield, and also makes possible the Lock-In feature. Lock-In tubes remain securely in sockets, assuring good contact at all times.

Detailed specifications on individual types are available on request.

CATHODE RAY TUBES

Sylvania Tubes 3API, 3AP4, 5BP1, 5BP4, 5AP1, 5AP4, 5GP1 and 5GP4 are electrostatically focused, electrically deflected cathode ray tubes. In general, each consists of a gun which forms a beam of electrons directed toward the screen, two sets of deflection plates which scan the beam over the screen, and a fluorescent screen which converts the energy of the beam into a spot of visible light.

Detailed specifications are available on request.

T-3 TUBES

Introduction of Sylvania's T-3 proximity-fuze type tube opens the way to new concepts in the design of radio and electronic equipment, making possible substantial savings in size and weight. In addition to the extremely small size of the tube itself, still further savings in space and weight are made possible by the elimination of conventional sockets, since the tube leads may be soldered directly into the circuit.

T-3 tubes are exceptionally rugged, have long life, and are especially suitable for operation at the higher frequencies.

LOCK-IN TRANSMITTING TUBES

First of a new line of Sylvania transmitting tubes featuring the Lock-In base, the 3D24 is a beam power tetrode with 45 watt anode dissipation. Electronic graphite anode allows high plate dissipation for small area and maintains constant interelectrode relationship and uniform anode characteristics.

The 3D24 may be used at full input up to 125 Mc. Maximum permissible frequency is undergoing study, and most recent test data may be obtained from Sylvania.

Electrical Characteristics

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filament Voltage</td>
<td>6.3 volts</td>
</tr>
<tr>
<td>Filament Current</td>
<td>3.6 amp.</td>
</tr>
<tr>
<td>Amplification Factor</td>
<td>50</td>
</tr>
<tr>
<td>Direct Inter-electrode Capacitance</td>
<td>0.2 µf max.</td>
</tr>
<tr>
<td>Grid-Plate Input</td>
<td>6.5 µf</td>
</tr>
<tr>
<td>Grid-Plate Output</td>
<td>2.4 µf</td>
</tr>
</tbody>
</table>

FOR COMPLETE DATA

Complete information on the entire line of Sylvania receiving tubes is contained in the "Technical Manual" which may be obtained from Sylvania Electric, Radio Tube Division, Emporium, Pa., at a cost of 85¢ a copy.

Over 500 types of tubes are listed. Contents include: Fundamental Properties of Vacuum Tubes; Characteristic Curves; General Tube and Circuit Information; Resistance-Coupled Amplifier Data—in addition to full specifications on all tubes.

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- Mini-Max" No. 753 is our newest "A-B" portable battery pack. Delivers 90 volts plate; 7 1/2-9 volts filament supply.

---

### TYPES VOLTAGE LENGTH WIDTH HEIGHT TERMINALS SUGGESTED CURRENT RANGE WEIGHT BATTERY

#### "A-B" PACKS FOR HOME RECEIVERS

<table>
<thead>
<tr>
<th>TYPES</th>
<th>VOLTAGE</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>HEIGHT</th>
<th>TERMINALS</th>
<th>SUGGESTED CURRENT RANGE</th>
<th>WEIGHT BATTERY</th>
</tr>
</thead>
<tbody>
<tr>
<td>758</td>
<td>1.5 A</td>
<td>10 1/2&quot;</td>
<td>4 3/4&quot;</td>
<td>6 1/2&quot;</td>
<td>Socket - , +1.5</td>
<td>A: 200-300 m.a.</td>
<td>14 lb., 8 oz.</td>
</tr>
<tr>
<td>759</td>
<td>7.5 &amp; 9 A</td>
<td>2 3/4&quot;</td>
<td>2 1/2&quot;</td>
<td>4 1/2&quot;</td>
<td>Socket - , +7.5 &amp; 9</td>
<td>B: 50 m.a.</td>
<td>4 lb., 15 oz.</td>
</tr>
<tr>
<td>754</td>
<td>7.5 &amp; 9 A</td>
<td>10 1/2&quot;</td>
<td>3 1/4&quot;</td>
<td>4</td>
<td>Socket - , +7.5 &amp; 9</td>
<td>B: 50 m.a.</td>
<td>6 lb., 8 oz.</td>
</tr>
</tbody>
</table>

#### "A" BATTERIES FOR HOME RECEIVERS

<table>
<thead>
<tr>
<th>TYPES</th>
<th>VOLTAGE</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>HEIGHT</th>
<th>TERMINALS</th>
<th>SUGGESTED CURRENT RANGE</th>
<th>WEIGHT BATTERY</th>
</tr>
</thead>
<tbody>
<tr>
<td>753</td>
<td>1.5 A</td>
<td>10 1/2&quot;</td>
<td>4 3/4&quot;</td>
<td>6 1/2&quot;</td>
<td>Socket - , +1.5</td>
<td>A: 200-300 m.a.</td>
<td>14 lb., 8 oz.</td>
</tr>
<tr>
<td>754</td>
<td>7.5 &amp; 9 A</td>
<td>2 3/4&quot;</td>
<td>2 1/2&quot;</td>
<td>4 1/2&quot;</td>
<td>Socket - , +7.5 &amp; 9</td>
<td>B: 50 m.a.</td>
<td>4 lb., 15 oz.</td>
</tr>
<tr>
<td>755</td>
<td>7.5 &amp; 9 A</td>
<td>10 1/2&quot;</td>
<td>3 1/4&quot;</td>
<td>4</td>
<td>Socket - , +7.5 &amp; 9</td>
<td>B: 50 m.a.</td>
<td>6 lb., 8 oz.</td>
</tr>
</tbody>
</table>

#### "A" BATTERIES FOR PORTABLE RECEIVERS

<table>
<thead>
<tr>
<th>TYPES</th>
<th>VOLTAGE</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>HEIGHT</th>
<th>TERMINALS</th>
<th>SUGGESTED CURRENT RANGE</th>
<th>WEIGHT BATTERY</th>
</tr>
</thead>
<tbody>
<tr>
<td>753</td>
<td>1.5 A</td>
<td>10 1/2&quot;</td>
<td>4 3/4&quot;</td>
<td>6 1/2&quot;</td>
<td>Socket - , +1.5</td>
<td>A: 200-300 m.a.</td>
<td>14 lb., 8 oz.</td>
</tr>
<tr>
<td>754</td>
<td>7.5 &amp; 9 A</td>
<td>2 3/4&quot;</td>
<td>2 1/2&quot;</td>
<td>4 1/2&quot;</td>
<td>Socket - , +7.5 &amp; 9</td>
<td>B: 50 m.a.</td>
<td>4 lb., 15 oz.</td>
</tr>
<tr>
<td>755</td>
<td>7.5 &amp; 9 A</td>
<td>10 1/2&quot;</td>
<td>3 1/4&quot;</td>
<td>4</td>
<td>Socket - , +7.5 &amp; 9</td>
<td>B: 50 m.a.</td>
<td>6 lb., 8 oz.</td>
</tr>
</tbody>
</table>

#### "A" BATTERIES FOR PERSONAL RECEIVERS

<table>
<thead>
<tr>
<th>TYPES</th>
<th>VOLTAGE</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>HEIGHT</th>
<th>TERMINALS</th>
<th>SUGGESTED CURRENT RANGE</th>
<th>WEIGHT BATTERY</th>
</tr>
</thead>
<tbody>
<tr>
<td>753</td>
<td>1.5 A</td>
<td>10 1/2&quot;</td>
<td>4 3/4&quot;</td>
<td>6 1/2&quot;</td>
<td>Socket - , +1.5</td>
<td>A: 200-300 m.a.</td>
<td>14 lb., 8 oz.</td>
</tr>
<tr>
<td>754</td>
<td>7.5 &amp; 9 A</td>
<td>2 3/4&quot;</td>
<td>2 1/2&quot;</td>
<td>4 1/2&quot;</td>
<td>Socket - , +7.5 &amp; 9</td>
<td>B: 50 m.a.</td>
<td>4 lb., 15 oz.</td>
</tr>
<tr>
<td>755</td>
<td>7.5 &amp; 9 A</td>
<td>10 1/2&quot;</td>
<td>3 1/4&quot;</td>
<td>4</td>
<td>Socket - , +7.5 &amp; 9</td>
<td>B: 50 m.a.</td>
<td>6 lb., 8 oz.</td>
</tr>
</tbody>
</table>

#### "A" BATTERIES FOR POCKET RECEIVERS

<table>
<thead>
<tr>
<th>TYPES</th>
<th>VOLTAGE</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>HEIGHT</th>
<th>TERMINALS</th>
<th>SUGGESTED CURRENT RANGE</th>
<th>WEIGHT BATTERY</th>
</tr>
</thead>
<tbody>
<tr>
<td>753</td>
<td>1.5 A</td>
<td>10 1/2&quot;</td>
<td>4 3/4&quot;</td>
<td>6 1/2&quot;</td>
<td>Socket - , +1.5</td>
<td>A: 200-300 m.a.</td>
<td>14 lb., 8 oz.</td>
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<tr>
<td>754</td>
<td>7.5 &amp; 9 A</td>
<td>2 3/4&quot;</td>
<td>2 1/2&quot;</td>
<td>4 1/2&quot;</td>
<td>Socket - , +7.5 &amp; 9</td>
<td>B: 50 m.a.</td>
<td>4 lb., 15 oz.</td>
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<tr>
<td>755</td>
<td>7.5 &amp; 9 A</td>
<td>10 1/2&quot;</td>
<td>3 1/4&quot;</td>
<td>4</td>
<td>Socket - , +7.5 &amp; 9</td>
<td>B: 50 m.a.</td>
<td>6 lb., 8 oz.</td>
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#### "B" BATTERIES FOR HOME RECEIVERS

<table>
<thead>
<tr>
<th>TYPES</th>
<th>VOLTAGE</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>HEIGHT</th>
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<th>SUGGESTED CURRENT RANGE</th>
<th>WEIGHT BATTERY</th>
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</thead>
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<tr>
<td>487</td>
<td>45</td>
<td>5 3/4&quot;</td>
<td>2 1/2&quot;</td>
<td>7 1/4&quot;</td>
<td>Socket - , +22.5, +45</td>
<td>7.0-12.0 m.a.</td>
<td>4 lb., 4 oz.</td>
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#### "B" BATTERIES FOR PORTABLE RECEIVERS

<table>
<thead>
<tr>
<th>TYPES</th>
<th>VOLTAGE</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>HEIGHT</th>
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<th>WEIGHT BATTERY</th>
</tr>
</thead>
<tbody>
<tr>
<td>482</td>
<td>45</td>
<td>3 3/4&quot;</td>
<td>1 1/2&quot;</td>
<td>5 1/2&quot;</td>
<td>Socket - , +45</td>
<td>5.0-15.0 m.a.</td>
<td>1 lb., 14 oz.</td>
</tr>
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#### "B" BATTERIES FOR PERSONAL RECEIVERS

<table>
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<th>TYPES</th>
<th>VOLTAGE</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>HEIGHT</th>
<th>TERMINALS</th>
<th>SUGGESTED CURRENT RANGE</th>
<th>WEIGHT BATTERY</th>
</tr>
</thead>
<tbody>
<tr>
<td>950</td>
<td>1.5</td>
<td>1 1/24&quot;</td>
<td>D</td>
<td>2 3/4&quot;</td>
<td>Flat Contact - , +1.5</td>
<td>25-250 m.a.</td>
<td>3 1/2 oz.</td>
</tr>
</tbody>
</table>

#### "A" BATTERIES FOR POCKET RECEIVERS

<table>
<thead>
<tr>
<th>TYPES</th>
<th>VOLTAGE</th>
<th>LENGTH</th>
<th>WIDTH</th>
<th>HEIGHT</th>
<th>TERMINALS</th>
<th>SUGGESTED CURRENT RANGE</th>
<th>WEIGHT BATTERY</th>
</tr>
</thead>
<tbody>
<tr>
<td>412</td>
<td>22.5</td>
<td>1 1/2&quot;</td>
<td>5/8&quot;</td>
<td>2</td>
<td>Flat Contact - , +22.5</td>
<td>0.3-1.0 m.a.</td>
<td>1 1/2 oz.</td>
</tr>
<tr>
<td>413</td>
<td>30</td>
<td>1 1/2&quot;</td>
<td>5/8&quot;</td>
<td>2 1/2</td>
<td>Flat Contact - , +30</td>
<td>0.3-1.0 m.a.</td>
<td>1 1/2 oz.</td>
</tr>
<tr>
<td>420</td>
<td>22.5</td>
<td>1 1/2&quot;</td>
<td>5/8&quot;</td>
<td>2 1/2</td>
<td>Flat Contact - , +22.5</td>
<td>0.5-2.0 m.a.</td>
<td>2 1/2 oz.</td>
</tr>
<tr>
<td>430</td>
<td>30</td>
<td>1 1/2&quot;</td>
<td>1&quot;</td>
<td>2 1/2</td>
<td>Flat Contact - , +30</td>
<td>0.5-2.0 m.a.</td>
<td>3 oz.</td>
</tr>
</tbody>
</table>

"Air-Cell" Battery

Write for your copy of Battery Engineering Bulletins Nos. 1 and 2


NATIONAL CARBON COMPANY, INC.
30 East 42nd Street, New York 17, N.Y.

Unit of Union Carbide and Carbon Corporation

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The curve shows the manner in which the reflected power increases with an increase in the voltage standing wave ratio. The curve is calculated from the following equation:

\[
\text{\% Power Reflected} = \left( \frac{V_{\text{max}}}{V_{\text{min}}} - 1 \right)^2 \left( \frac{V_{\text{max}}}{V_{\text{min}}} + 1 \right)
\]
FRACTIONAL H.P. MOTORS

73C & 74C SERIES

Table:

<table>
<thead>
<tr>
<th>TYPE</th>
<th>H.P.</th>
<th>R.P.M. 60 Cy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacitor</td>
<td>1/15, 1/20, 1/30</td>
<td>1600 &amp; 3200</td>
</tr>
<tr>
<td>Shaded Pole</td>
<td>1/30, 1/50, 1/100</td>
<td>1500</td>
</tr>
<tr>
<td>Synchronous</td>
<td>1/50, 1/100</td>
<td>1800 &amp; 3600</td>
</tr>
</tbody>
</table>

73 & 74 SERIES
115-220 Volts—50, 60 cycles. Fan or Intermittent duty. Sleeve Bearing. Totally Enclosed. Outside Diam. 3 5/16".

Table:

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<td>1500</td>
</tr>
<tr>
<td>Synchronous</td>
<td>1/50, 1/100, 1/200</td>
<td>1800 &amp; 3600</td>
</tr>
</tbody>
</table>

31 SERIES
115 Volts, 400 cycles. 1/25 to 1/100 H.P. Weight of units 15 oz. Diam. 1/2" Length 2 1/4".

36 SERIES
D.C. Voltage Generators for Control and Tachometer applications. 2 Volts per hundred R. P. M. Permanent magnet field weight, 20 oz. Diameter 2 1/4". Length 3".

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FIBERGLAS-MICA COMBINATIONS
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<table>
<thead>
<tr>
<th>Code</th>
<th>Case</th>
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<tr>
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<td>EI-12</td>
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<td>12</td>
<td>51/2&quot;</td>
<td>41/2&quot;</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Lightweight airborne transformers and components</th>
<th>Maximum power output with minimum weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadcasting Station Components, Power Supplies and Transformers, Audio frequency transformers</td>
<td></td>
</tr>
<tr>
<td>Pulse Transformers, Blocking Oscillator Transformers, Power Transformers, Choke Coils</td>
<td>Open and Hermetic Types, Class A, B &amp; C insulation</td>
</tr>
</tbody>
</table>

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### J Values for Series Filament Rectifiers

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Voltage</th>
<th>Current</th>
<th>Peak Plate Current</th>
<th>Small Signal</th>
<th>Small Signal</th>
<th>Zero Signal</th>
<th>Signal</th>
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<td>Remote Cut-off Transformer</td>
<td>250</td>
<td>1250</td>
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### Summary of J Values

- **RFC**: Remote Cut-off Transformer
- **J**: Junction Current
- **V**: Voltage
- **I**: Current
- **P**: Plate Current
- **S**: Small Signal
- **Z**: Zero Signal
- **R**: Rectifier
- **T**: Transformer

---

**Notes**

- **J Values**: Junction Current at specified voltage and current.
- **Small Signal**: Maximum J at small signal levels.
- **Zero Signal**: Zero signal with no applied signal.

---

**Tung-Sol Lamp Works Inc.**

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- **Sales Offices**: Across the U.S.

**Products**

- **Miniature Incandescent Lamps**
- **Glass-Insulated Beam Lamps**
- **Current Intermittors**

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**Electron Tubes**

**Electronics Buyers’ Guide — June, 1947 — Mid-Month**

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**Contact Information**

- **Atlanta**: 613 E. 6th St. 
- **Chicago**: 250 N. Michigan Ave. 
- **Denver**: 15 W. 17th St. 
- **Detroit**: 3000 W. Grand Blvd. 
- **New York**: 14 W. 40th St. 
- **Los Angeles**: 300 S. Broadway

---

**Specifications**

- **Voltage**: 60 V, 120 V, 220 V, 250 V
- **Current**: 0.5 A, 1 A, 1.5 A, 2 A
- **Maximum Plate Current**: 5 A, 10 A, 15 A

---

**Conversion Factors**

- **DC to AC**: 2.828
- **AC to DC**: 0.707

---

**Current Intermittors**

- **Miniature**: 2.5 A, 5 A, 10 A
- **Full Wave**: 5 A, 10 A, 15 A

---

**Pilot Lamp**

- **Cutoff**: 10 V, 15 V, 20 V
- **Peak Plate Current**: 500 mA, 1 A, 2 A

---

**Tung-Sol**

- **Vibration-Tested**
- **Electron Tubes**

---

**Specifications**

- **Voltage**: 60 V, 120 V, 220 V, 250 V
- **Current**: 0.5 A, 1 A, 1.5 A, 2 A
- **Maximum Plate Current**: 5 A, 10 A, 15 A

---

**Conversion Factors**

- **DC to AC**: 2.828
- **AC to DC**: 0.707

---

**Current Intermittors**

- **Miniature**: 2.5 A, 5 A, 10 A
- **Full Wave**: 5 A, 10 A, 15 A

---

**Pilot Lamp**

- **Cutoff**: 10 V, 15 V, 20 V
- **Peak Plate Current**: 500 mA, 1 A, 2 A
POWR-PAKT FAN MOTOR

The new Model A shaded pole, induction-type Alliance Powr-Pak Fan Motor for speeds from 500 to 1050 R.P.M., operates on 50 or 60 cycles at voltages up to 220, 1/30th h.p., size 4% x 2¾ in. Has porous bronze, oilless-type sleeve bearings. Open or fully enclosed construction. Approx. 8 to 40 oz. in full load running torque, depending on stack length. Exceptionally quiet. For continuous or intermittent duty. Runs clockwise or counter clockwise—not reversible.

MINIATURE POWER PLANT MODEL MS

Here is a truly miniature power plant for 110 v., 60 cycle operation, so compact and light in weight that it can be used where many designs call for "tailored power." The Model MS has been developed to fill the growing need for small power to increase the motion and utility features of thousands of new products! SPECIFICATIONS: Draws about 25 watts at 3000 R.P.M. no load. The speed is 2500 to 3000 R.P.M. depending on frequency and load. Develops about .006 h.p., 5/32 in. diameter, centerless, round steel shaft. Has latest type graphite bronze oilless bearings, self-aligning and amply proportioned. Motor measures 1¾ in. x 2 in. x 3¾ in.

MODEL 80: Operates on 110 or 220 v., is made for 40, 50 or 60 cycles, 16 watts input, 78 R.P.M. Has no gears—runs at an even speed—has a smooth, quiet, positive friction-rim drive. Amply proportioned bearings with large reservoirs assure long life. Motor and idler plate shock mounted to minimize vibration transfer to turntable and motor board. Forced ventilation gives cool operation—the slip-type fan avoids any possible injury. Mounting plate maintains correct turntable height, regardless of mounting board thickness. Available with 8, 9 or 10-inch turntable tops. Max. depth below base mounting plate, 2 1/16 in.

MODEL K 25 CYCLE MOTOR: A 25 cycle companion to the Model 80. Operates on 110 v., 25 cycles, at 12-watt input, especially designed for 25 cycle operation. It has all the advantages of Model 80. Mounting may be interchanged without any sacrifice in performance. Motor and idler plate are shock mounted to cabinet mounting plate for low vibration transfer to turntable and motor board. Available in 8 or 9 in. turntable sizes only. Max. depth below base mounting plate, 2¼ in.
**GRID CONTROL RECTIFIERS (THYRATRONS)**

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<tr>
<th>Model</th>
<th>D.C. Output (Amps.)</th>
<th>Peak Anode Current</th>
<th>Peak Forward Volts</th>
<th>Peak Inverse Volts</th>
<th>Filament Volts</th>
<th>Filament Amperes</th>
<th>Overall Length</th>
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<td>EL C1B</td>
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**RECTIFIERS**

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<th>Peak Forward Volts</th>
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<th>Filament Amperes</th>
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**HALF WAVE RECTIFIER**

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<td>620</td>
<td>1250</td>
<td>2.5</td>
<td>36</td>
<td>10&quot;</td>
</tr>
</tbody>
</table>

**Electronics Incorporated**

127 Sussex Avenue
Newark, N.J.

Performance & characteristics are independent of ambient temperatures
Sweeping OSCILLATOR
WIDE RANGE

THE MEGA-SWEEP
Shows at a glance the response of any network or amplifier. Eliminates the tedious point to point analysis. Saves engineering time and stimulates research. Valuable for television production alignment.

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CARRIER FREQUENCY
50 kilocycles to 500 meegacycles and up.
FREQUENCY SWEEP
From 30 megacycles to 30 kilocycles, throughout the complete spectrum.
CONTINUOUSLY VARIABLE ATTENUATOR
LOW AMPLITUDE MODULATION WHILE SWEEPING
Less than 0.1 DB per megacycle.
PRECISION WAVEMETER
USES:
Testing Television Systems and Components.
Testing Radar Systems and Components.
Instructional Purposes in Schools and Universities.
Designing Wide-Band i. f. Amplifiers.
Designing Filter Networks.
Production Testing of F. M. and Television Equipments.
As a Signal Source of Extraordinary Range (Unmatched by any existing commercial signal generator.)
As a cw high frequency oscillator.
Self-contained, Regulated, Power Supply—117 Volt 60 Cycle operation—Size 9" x 17" x 11"—Weight 35 Pounds.
Price $395 F. O. B. Newark, New Jersey.

KAY ELECTRIC CO.
NEWARK 2, NEW JERSEY

Do you know that...
every electronic component or packaged equipment item is listed in the pages of this BUYERS' GUIDE...

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or **TYPE 17 SYSTEM**
VHF Receiver and VHF Transmitter.

**TYPE 15**
VHF Omni-Directional Range Receiving Equipment.

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**"MUSIC-BOX" TYPE SELECTOR SWITCHES**
For low-voltage control circuits. Unusually positive detent action. Lever-type control handle.

**CERAMIC-INSULATED PLUGS AND RECEPTACLES**
24 combinations. 2 to 19 contacts.

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1¼" long. SPST, DPST, SPST-SPDT, and DPDT.

**DRY ELECTROLYTIC, SEALED CONDENSERS**
Terminals mounted on mica. No bakelite-rubber seals.

**MINIATURE PIN-PLUG CONNECTORS**
Specially designed to minimize spring fatigue.

**SNAPSLIDE FASTENERS**
7/16" wide size, for heavy loads. ¾" wide size, for light loads.

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**TYPE H-10 TEST SET**
for the 1.2 cm band

and various assemblies for the 10 cm, 3.3 cm, and 1.2 cm bands.

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Materials for potting, dipping or impregnating all types of radio components or all kinds of electrical units. • Tropicalized fungus proofing waxes. • Waterproofing finishes for wire jackets. • Rubber finishes. • Inquiries and problems invited by our engineering and development laboratories.

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EIGHT HEAD HOT-CUT FLARE MACHINE

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Glass tubing 27 to 45 gauge
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...Nichrome* and Nichrome* V, for winding large value resistors where overall size is limited, but dependability is a must.
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...Advance®, most frequently specified for precision resistors in electric meters and laboratory testing devices, because in its finer sizes it has a temperature coefficient of only ±00002/°C.
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A.C. test signal control consists of a Voltstat and a bridge input transformer. A Voltstat permits adjustment of the value of the test signal and a low-high switch allows even minute voltages to be impressed on the inductance under test by use of the same Voltstat. An adjustable series resistor insures best possible waveform across coil under test. Price Complete $350.

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The Oscilloscope... Has 3" cathode ray tube and is provided with a high gain vertical amplifier, a horizontal amplifier, a saw-tooth generator, necessary supplies and auxiliary equipment. Vertical amplifier readily adjusted for any required gain without changing its input impedance and is provided with 5 frequency selective networks of 60, 120, 400, 800 and 1000 cycle band pass which depresses the second harmonic about 30 dB so that non-linearity of coil under test does not confuse balance. Usual controls for intensity, focus, centering, synchronization, and gain also provided.

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INSULATION TEST SETS


Model IT-630 Features: Smooth variable voltages from 0 to 3000 or 0 to 600 volts A.C. Instantaneous trip Circuit Breaker indicates breakdown. Heavy bakelite shock-proof Test Handles with disappearing points. Voltmeter indicates output voltages 0-300 or 0-6000 volts. Heavy gauge steel cabinets, gray finish. Input 115 Volts 60 Cycle—Rating 1 KVA. $125.00.

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POWER • OUTPUT TRANSFORMER • FILTER REACTORS

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**VARGLAS—SILICONE**

Varglas-Silicone sleeving, tubing, lead wire, and tying cord are recommended for applications involving continuous operating temperatures up to 650°F combined with the following qualities:

1. Low temperature resistance in general. Good resistance to chafing and abrasion in all grades—in some grades down to 45°F.
2. Moisture resistance, including salt water, acids and mild alkalis.
4. Resistance to lubricating oils—samples immersed for two weeks at 160°F show little absorption.
5. Mechanical strength—strength of the accepted insulating materials.
6. Electrical properties—excellent electrical resistance and low power factors.

Varglas-Silicone insulation is available in seven standard colors at no extra charge.

Varglas-Silicone double wall sleeving and tubing are available for special applications.

Varglas-Silicone materials are available in the following grades:

1. **SILFLEX SLEEVING**—Light saturation of Silicone resin on Fiberglas braid. Abrasion resistance and flexibility excellent under prolonged temperatures from -85°F to 500°F. Extremely flexible. No dielectric guarantee.

2. **VARGLAS SILICONE SLEEVING TYPE RW SYNTHETIC**—Furnished in natural color and long lengths. If other colors or coils are desired, specify Varglas Non-Fray Sleeving Type HP.

3. **VARGLAS SLEEVING TYPE P**—Fiberglas braid with vinyl type coating in Grades C-1, C-2 and C-3. This sleeving is more flexible than that on which the conventional oleoresinous varnish coatings are used. Heat endurance is intermediate between lacquer and varnish.

4. **VARGLAS LITEWALL SLEEVING**—A very flexible sleeving furnished either with or without treatment on Fiberglas braid. Available in two wall thicknesses—.008" (Type A) and .006" (Type B). The treated Litewall Sleeving is available in colors, the untreated in white only. Both grades are put flat on fibre spools.

5. **VARGLAS SLEEVING TYPE RW SYNTHETIC**—Fiberglas braid with a new type of coating of the oleoresinous varnish class but with higher heat resistance than the conventional varnish—up to 500°F. Very flexible. Available in Grades C-1, C-2 and C-3 sleeving and Grades A and B tubing.

**VARGLAS TUBING**

1. **VARGLAS TUBING TYPE YS SYNTHETIC**—Grade A or Grade B. It offers you maximum flexibility—even where dielectric requirements are 7000 volts and more—and yet it will withstand short time temperatures as high as 425°-450°F. Applied on a braid made from continuous filament Fiberglas yarns, this synthetic coating prevents fraying and increases dielectric qualities, while the finished product is as flexible as extruded plastic tubing. Will not support combustion. Available in seven colors and in long lengths.

2. **VARGLAS VARNISHED AND LACQUERED TUBING**—Flexible, continuous coatings of flame-resistant varnish or lacquer applied over Fiberglas braid in 8 or more carefully controlled operations. These coatings have thinner walls and greater heat resistance (400°-425°F) than the lacquered tubings, but are slightly less flexible.

3. **VARGLAS VARNISHED AND LACQUERED SLEEVING**—Similar to Type H except for a dye treatment. Available in colors, and Grades C-1, C-2 and C-3. Good for short pieces, as fraying is minimized.

**SYNTHOLVAR EXTRUDED PLASTIC TUBING**

Made from a thermoplastic synthetic resin compound, this tubing is particularly suitable for applications where low temperature flexibility is very important. Available in Electrical Grade and HH Grade. Complete data sheets available on request.

**VARNISHED COTTON SATURATED SLEEVING**

This sleeving is braided from long staple cotton yarns and is available in Grades C-1, C-2, and C-3. The usual impregnant is oleoresinous varnish, but lacquer coatings are also furnished. See description of the three grades under Varglas Saturated Sleeving.

**VARNISHED COTTON VARNISHED AND LACQUERED TUBING**

Varglas Cotton Tubing is available in the same grades as Varglas Varnished and Lacquered Tubing. Suitable for applications where the superior qualities of the Fiberglas products are not essential. Send for our new sample folder showing our complete line. Also, our Varglas-Silicone sample folder and the VTA Standards booklet are yours for the asking.

**VARFLEX CORPORATION**

Makers of Electrical Insulating Tubing and Sleeving...Member of Varnished Tubing Association.

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All temperature ranges, deflection rates and electrical resistivities.

Silver Clad Steel Jacketed Wire
Silver on Steel, copper, Invar or other combinations requested.

Rolled Gold Plate and Wire

Hi-Span C™
New Constant Modulus Alloy

Special Materials

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SPECIALISTS FOR 30 YEARS IN THE MANUFACTURE OF THERMOMETALS • ELECTRICAL CONTACTS • PRECIOUS METAL DIMETALLIC PRODUCTS

ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH
The solution of filter network problems, has been greatly simplified through the use of toroidal coils wound on molybdenum permalloy cores. Design engineers have learned to depend upon them since discovering that only these toroids possess all the necessary qualities of a good high "Q" coil.

The three principal types now being supplied are:

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<td>1 K.C.—20 K.C.</td>
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<td>TC-2</td>
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<td>TC-3</td>
<td>10 K.C.—100 K.C.</td>
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We are producing toroidal coil filters which consistently demonstrate the value of toroidal coils. These filters cannot be matched in stability, accuracy and sharpness by filters made with the usual laminated type of coil.

Orders for samples or production quantities are equally respected. All inquiries will be promptly handled.

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- Audio Frequency Generators
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Here is wire recording with all the “bugs” out. MAGNECORDER, a strictly professional magnetic recording and reproducing device, incorporates many of the electronic developments of the war years.

MAGNECORDER OFFERS YOU . . . HIGH FIDELITY . . .
frequency response flat within 2 db from 50 to 12,000 cps with signal noise ratio of well over 45 db. Less than 1 1/2% harmonic distortion. ELIMINATION OF WOW AND FLUTTER . . . 30 MINUTE PLAYING TIME . . . HIGH SPEED FORWARD-REWIND SPOOL . . . SIMPLE OPERATION . . . LASTING QUALITY . . . GENUINE ECONOMY. Write for literature.

MAGNECORD, INC.
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ELECTRONICS BUYERS’ GUIDE — June, 1947 — MID-MONTH
Most of the radio tube contacts used today are made by the BEAD CHAIN MULTI-SWAGE PROCESS.

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THESE ARE STANDARD MULTI-SWAGE PARTS

CONTACT PINS

TERMINALS

WIRE LEADS

JACKS

FOR COMPLETE INFORMATION—This twelve-page catalog contains complete mechanical specifications about standard MULTI-SWAGE CONTACT PINS, TERMINALS, WIRE LEADS and JACKS. Write for Free Copy.

THE BEAD CHAIN MANUFACTURING COMPANY
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See Cinaudagraph for the most complete line of speakers for radio, inter-com, P. A. systems, replacement speakers, phonographs, special applications of all kinds. Internationally famous for high fidelity, consistent performance, ruggedness. Superior engineering and construction throughout. Have Alnico 5 magnets, highest quality materials throughout. Specifications on typical models are listed below. For complete information and engineering specifications on all models ask for Data Sheet 100.

CINAUDAGRAPH SPEAKERS, INC.

SLATER, MISSOURI

2" SPEAKERS
Model P2A
2½" square basket
1-41/64" maximum depth
½" voice coil
.68 oz. Alnico 5 Magnet
3.2 or 40 ohm voice coils
Also 1.0 and 1.47 oz. models

5" SPEAKERS
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5" diameter basket
2½" maximum depth
¾" voice coil
3.16 oz. Alnico 5 Magnet
3.2 ohm voice coil
Five other models available

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3.2 or 8 ohm voice coils
Other 8" speakers with magnets as small as 1.47 oz.

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12½" o.d. basket
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21.5 oz. Alnico 5 Magnet
8 or 16 ohm voice coils
Also four other magnet weights

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3.2 or 4 ohm voice coils
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3.2 ohm voice coil
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1¾" voice coil
12.1 oz. Alnico 5 Magnet
8 ohm voice coil
Also in three smaller magnet weights

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15½" o.d. basket
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1¾" voice coil
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Also Model P15M with 21.5 oz. Magnet
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THE BENEFITS OF WAR-GAINED EXPERIENCE
ON ALL TYPES OF
ASSEMBLY JOBS—LARGE OR SMALL

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SHEET METAL & BAKELITE
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FROM SHEETS, RODS AND TUBES—PANELS
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QUALITY—AT LOW COST . PROMPT DELIVERY
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SEND US YOUR SPECIFICATIONS FOR IMMEDIATE ATTENTION

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
P. E.* announces distributorship of

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IN THE HISTORY OF SELF-LOCKING NUTS

In every phase of electronics—when you need a self-locking nut, NYLOK is better!

It holds tighter . . . cannot shrink, cannot shake loose . . . moisture absorption is practically nil . . . will not distort in freezing temperatures . . . will not shrink in drying atmosphere . . . has high resistance to esters, ketones, alcohols, weak acids, and other chemicals such as 40% caustic soda solution . . . is unaffected by age or cold . . . offers low initial "on" torque . . . and minimum of variation in torque characteristics between nuts. Point after point, in every way, Nylok has proven superior to all other non-metallic lock-nuts. Write for prices, information and samples.

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New Nut Uses NYLON as Locking Element

Illustrating construction of new Nylok Nut.

A. Shows sturdy, light-weight construction embodying steel outer shell formed to accommodate steel hex nut slug and hexagonal molded Nylon insert.

B. I.D. of Nylon insert held to +.001" for accurate torque control.

C. Cross section.
Case History
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Radio Dial windows are a Printloid specialty, and we have made millions for the country's largest radio manufacturers. Printloid has worked for every industry, producing finished products as well as sub-assemblies.

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MACHINING
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PRINTLOID, INC., DEPT. E
93 Mercer Street
New York 12, New York

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Results? No shopping around, no wasted time. Instead, better design, uniform control and lower costs with Printloid engineering supervision at every step of the job.
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Complete information on these resistors is given in a new I-T-E Resistor Catalog. Its 16 pages contain technical information on I-T-E Resistors, handy formulas and charts for selecting resistors, and a complete listing of resistor sizes and ratings, together with individual pictures of each type. Also included are derating and size selection data, construction, ordering information and the answers to many other resistor problems.

Send, today, for your copy of this catalog to:

The center of Switchgear Progress

RESISTOR DIVISION, I-T-E Circuit Breaker Company
1898 Hamilton Street, Philadelphia 30, Pa.
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Special Characteristics on a to-order basis

WATCH JENNINGS FOR NEW DEVELOPMENTS IN THE FIELD OF SPECIALIZED VACUUM ELECTRONIC COMPONENTS

VACUUM VARIABLE CAPACITORS

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Capacity Range, mmfd. Max. 875, Min. 30
Peak Volts, 10KV, L. 13/8", D. 4 1/4"

**TYPE UX**

Capacity Range, mmfd. Max. 560, Min. 40
Peak Volts, 10KV, L. 14/3/16", D. 4 1/4"

**TYPE UHX**

Capacity Range, mmfd. Max. 150, Min. 25
Peak Volts, 10KV, L. 14/3/16", D. 4 1/4"

**TYPE U**

Capacity Range, mmfd. Max. 250, Min. 50
Peak Volts, 10KV, L. (available in 15KV) L. 11/8", D. 4 1/4"

**TYPE UXH**

Capacity Range, mmfd. Max. 75, Min. 10
Peak Volts, 30KV, Dimensions same as Type U

**TYPE AT**

Capacity Range, mmfd. Max. 50, Min. 5
Peak Volts, 10KV, and 20KV, L. 6/9/16", D. 3/4"

**TYPE T**

Capacity Range, mmfd. Max. 25, Min. 5
Peak Volts, 10KV and 20KV, L. 6/9/16", D. 3/4"

**TYPE TR** (Not illustrated)

Capacity Range, mmfd. Max. 750, Min. 115"
Dimensions same as Type T

**TYPE SS** (SPLIT STATOR)

Capacity Range per section
MMfd. Max. 50, Min. 10
Peak Volts, 75KV, L. 7/16", D. 3"

**VACUUM FIXED CAPACITORS — TUNGSTEN LEADS**

**TYPE VC-250**

Capacities available, mmfd. 250 & 250
Peak Volts, 10 & 20KV, L. 6/15", D. 3/2"

**TYPE VC-50**

Capacities available, mmfd. 6 thru 150
Peak Volts, 10, 20, 30KV, L. 6/15", D. 3/2"

**VACUUM FIXED CAPACITORS**

**HIGH AMPERAGE TYPE**

(Constructed entirely of Copper)

**TYPE J.C.-1** (Not illustrated)

Capacities available thru 25 mmfd.
Peak Volts, 15KV, L. 3/4", D. 1 3/4"

**TYPE J.C.-2**

Capacities available thru 100 mmfd.
Peak Volts, 20KV, L. 3/4", D. 1 3/4"

**TYPE J.C.-3**

Capacities available thru 50 mmfd.
Peak Volts, 35KV, L. 3/4", D. 1 3/4"

(COPPER ANODE)

VACUUM FIXED CAPACITORS

(May be internally water or air cooled)

**TYPE M—COCONUT**

Capacities available, mmfd. 500, 750 or 1,000
Peak Volts, 15KV, L. 3/4", D. 1 3/4"

**TYPE MH—COCONUT**

Capacities available up to 200 mmfd.
Peak Volts, 35KV, Dimensions same as Type M

JENNINGS RADIO MANUFACTURING COMPANY

1098 EAST WILLIAM STREET, SAN JOSE 12, CALIFORNIA, U. S. A.

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
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1947
502 Pages
$5.00
A practical, non-mathematical discussion of the functioning of all types of electronic tubes and the basic circuits in which tubes are used in many industrial applications.

ELECTROOPTICS AND THE ELECTRON MICROSCOPE
By V. K. Zworykin, G. A. Morton, E. G. Ramberg, J. Hillier, A. W. Vance
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Designed to aid the electron microscopist in understanding and using his instrument to greatest advantage.

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By A. F. Harvey
1945
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HIGH-FREQUENCY NETWORKS
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Covering the entire profession, including both electrical and electronic development.

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GUIDE TO CATHODE RAY PATTERNS
By Merwyn Bly
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$4.75
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COMMUNICATION NETWORKS
By T. A. Guellem
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587 Pages
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(B) The knurled cup point of this "Unbrako" Socket Set Screw makes it a Self-Locker—the point digs-in and stays dug—regardless of the most chattering vibration. Yet, it can be backed-out with a wrench and used over and over again. Sizes from #4 to 1-1/2" in diameter.

(C) Knurling of this "Unbrako" Socket Set Screw swages the threads and makes it a most excellent Self-Locker—for use where the points such as: flat, dog, cone and oval do not lend themselves to knurling. Sizes from #4 to 1-1/2" in diameter.

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Available in more than 1300 ready-made styles—featuring interchangeable shelf, drawer and cabinet units that assure you of getting just the work bench you require. Built for long, hard wear, these "Hallowell" Work-Benches of Steel are sturdy and stand firm without costly bolting to the floor, because of the flared feet. Five different leg heights, seven different lengths. Benches can be joined end to end to form a workbench of any continuous length. WRITE FOR "HALLOWELL" CATALOG.

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PRECISION MEASURING INSTRUMENTS FOR THE RADIO AND ELECTRONIC INDUSTRY

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RF COVERAGE: 54—216 megacycles in two ranges; accuracy ±0.5%.
FM DEVIATION: Two ranges, 0—80 kc., 0—240 kc., continuously adjustable.
FM DISTORTION: Less than 2% at 75 kc. deviation.
AMPLITUDE MODULATION: One range, 0—50%; calibrations at 30% and 50% modulation.
INTERNAL MODULATING FREQUENCIES: Eight frequencies from 50 cycles to 15 kc.
RF OUTPUT: 0.1 microvolt to 0.2 volt, continuously adjustable by means of 26.5 ohm piston type attenuator.

UNIVERTER TYPE 203-B
An FM-AM frequency converter accessory with unity gain for use with 202-B FM Signal Generator.
RF RANGE: 0.4 mc. to 25 mc.
RF INCREMENT DIAL: ±250 kc. in 10 kc. increments.
RF OUTPUT: 0.1 microvolt to 0.2 volt, calibrated output (approximately 26.5 ohms); 2 volts max. uncalibrated output (470 ohms).

Q-METER TYPE 160-A
FREQUENCY RANGE: 50 kc. to 75 mc. (= 1%), 50 kc.—30 mc. (= 3%), 30 mc.—75 mc. May be extended down to 1 kc. with external accessory oscillator.
RANGE OF Q MEASUREMENTS, COILS: 50—625.
ACCURACY OF Q MEASUREMENT: In general, ±5%.
RANGE OF Q TUNING CAPACITOR: Main Section, 30—450 mmf. (= 1% or ±1 mmf., whichever is greater). Vernier Section, plus 3, zero, minus 3 mmf. (= 0.1 mmf.).

Q-METER TYPE 170-A
FREQUENCY RANGE: 30 mc. to 200 mc. (= 1%).
RANGE OF Q MEASUREMENT: 80—1200.
ACCURACY OF Q MEASUREMENT: In general, ±10%.
RANGE OF Q TUNING CAPACITOR: 11—60 mmf. (= 1% or ±0.5 mmf., whichever is greater).

QX-CHECKER TYPE 110-A
FREQUENCY RANGE: 100 kc. to 25 mc. using accessory plug-in inductors. A calibration sheet is supplied with each inductor, accurate to within ±3%.
RANGE OF COIL CHECKS: Inductors having values between 10 microhenries and 10 millihenries may be checked against a standard to an accuracy of about ±0.2% provided the Q of the inductor is 100 or greater.
CAPACITANCE RANGE: Capacitance values between about 2—1000 mmf. may be checked against standard by direct substitution, with an accuracy of a few tenths of one mmf., provided Q of capacitors is high.

BEAT FREQUENCY GENERATOR TYPE 140-A
FREQUENCY RANGE: 20 cycles to 5 megacycles in two ranges; LOW RANGE: 20 to 30,000 cycles. HIGH RANGE: 30 kilocycles to 5 megacycles. Accuracy ±2 cycles up to 100 cycles, ±2% above 100 cycles.
OUTPUT POWER: One watt, available from a variety of output impedances.
ATTENUATOR: 5 steps; X1.0, X0.1, X.01, X.001, X.0001.
DISTORTION: 5% or less.

Write for further information
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- SJ 283 Cord, Constant Service Tools, Washing Machines, etc.
- VVR 283 Cord, Heavy Duty Equipment, Power Tools, etc.
- HDG Heating Appliances

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- Allied
- Glade
- Gilber
- Carling
- Diamond
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- Lugs
- Ground Jacks
- Loops
- Insulated Lugs
- Markers

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- Feed Thru Switches—Snap-it, Carling, Electric

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OR—We'll make any special type of cord set, cable or lead you require. Samples made from your prints and prices quoted on request. We guarantee prompt deliveries. We carry stocks of insulated electrical wire in gauges 24 to 00 in a variety of insulations and strandings. Single and multiple conductor cable in addition to items listed may be obtained from our mills. We invite your inquiries. Specify gauge, insulation, stranded and color desired when requesting information.

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5734 N. ELSTON AVENUE
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How to add "SELL" to you.

Premier Dials, Panels and Nameplates combine maximum utility with the added PLUS of sales appeal. Sharp, clear and accurate! Rich colors and "baked-in" finishes! Premier metal products reflect this superiority in increased sales for you.

WRITE FOR BOOKLET

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Quality Products for Over 35 Years
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Do you know that... every electronic component or packaged equipment item is listed in the pages of this BUYERS' GUIDE...

Use it for Quick Reference as you work.

TELEX MONOSET—WHEREVER, WHENEVER HEADSETS ARE REQUIRED

MODERN • LIGHTWEIGHT • COMFORTABLE

Cleverly designed in tough durable Tenite, the TELEX Monoset is quickly replacing old-style, cumbersome headsets because it is made to wear under the chin instead of over the head. Precision-built magnetic receiver assures excellent fidelity.

The NEW Monosets incorporate a volume control feature that permits the wearer to control volume of sound at the point of reception.

Specifications

IMPEDEANCE
2000 ohms—Part No. 2568
500 ohms—Part No. 2569
128 ohms—Part No. 2570

SENSITIVITY
18 dynes per square centimeter for 10 microwatt input.

Canadian Distributors:
Addison Industries, Ltd., Toronto

ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH

207
SOUNDCAST guarantees maximum high fidelity recordable area for sound reproduction without jeopardizing quality or consistency.

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- Uniform coating right to the edge is made possible by the exclusive Soundcraft coating process plus Soundcraft high-solids recording lacquer, a combination representing years of experimentation by those who really know the requirements of the industry.

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  8" 10" 12" 16"
- The "Playback"
  6½" 8" 10" 12" 16"
- The "Audition"
  6½" 8" 10" 12" 16"
- The "Maestro"
  12" 13¼" 17¼"

REEVES SOUNDCAST CORPORATION
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* PROGRESS ALONG SOUND LINES *
THE Richardson Company—to our knowledge—is the only plastics manufacturer fully equipped to do both laminating and molding of plastics ... the molding of rubber and bituminous plastics and the manufacturing of rubber-plastic combinations. Facilities are at hand for all fabricating and finishing operations. Thus, Richardson is free to recommend the operation and material best suited to your requirements.

Why not consult Richardson if you are planning new products or the redesigning of present models? Get the benefit of The Richardson Company's versatility in manufacturing methods, personnel, and products. Richardson Plasticians can help you improve both the appearance and performance of your products. Write today for information.

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- Phenolic
- Urea
- Melamine
- Aniline, etc.

LAMINATED AND MOLDED RODS

LAMINATED, ROLLED AND MOLDED, TUBES

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Large Stack) Selenium Rectifier. Three phase bridge, fan cooled. Output rating 100 amperes, 14 volts DC. Size over all 7¾” x 5½” x 6”.

(Small Stack) Selenium Rectifier. Single phase DC valve. Blocks 30 volts, passes 0.15 amperes DC. Size over all 1” x 1½” x ¾”.

Large Stack) Copper Sulphide. Three phase bridge, fan cooled. Output rating 100 amperes, 7½ volts DC. Size over all 8” x 4¼” x 3½”.

(Small Stack) Copper Sulphide. Single phase bridge, convection cooled. Output rating 3.2 amperes, 5 volts DC. Size over all 2½” x 1½” x 1¼”.

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Maximum output voltage per cell — 12 to 20 volts or more. Any voltage available with series combinations. High efficiency — 60 to 70% single phase, 70 - 85% 3 phase. Low temperature rise — average 20-40° C. Excellent moisture and corrosion resistance. Protective finishes for any kind of service. Minimum aging — negligible in most applications. Extremely long life. Contacts many other assembly components. Light weight — up to 400 output watts per pound. Wide variety of sizes — range from 1” diameter discs to 4½” x 1” rectangular plates — any arrangement of circuits, series or parallel connections.

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Write for Bulletin R-41 containing additional information on B-L Selenium Rectifiers or Bulletin R-38 for additional information on B-L Copper Sulphide rectifiers.
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WITH NEW MODEL EL-2 EQUALIZER
for realistic reproduction of transcriptions

The New Model EL-2 EQUALIZER has all components enclosed in one compact housing. This built-in feature replaces the old-style two-piece equalizer; also eliminates heavy cable. The newly designed Equalizer, in one complete package, embodies double housing which gives double shielding against hum pickup. Combines the switch mechanism as well as impedance matching and correct equalization for following switch positions:

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LATERAL NO. 3—Linear from 40 to 3500 C.P.S. with roll-off to 10 D.B. at 10,000 for shellac recording.

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Write to the address below for detailed information on these and other Bendix Dynamotors to meet your power requirements.

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<table>
<thead>
<tr>
<th>Model</th>
<th>Frame Size</th>
<th>Input Volts</th>
<th>Output Volts</th>
<th>Output Watts</th>
<th>Approx. Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA58A</td>
<td>2 1/4&quot;</td>
<td>14</td>
<td>250</td>
<td>15</td>
<td>2 lb. 12 oz.</td>
</tr>
<tr>
<td>D1A</td>
<td>3 1/2&quot;</td>
<td>14</td>
<td>230</td>
<td>23</td>
<td>5 lb.</td>
</tr>
<tr>
<td>DA77A</td>
<td>4&quot;</td>
<td>5.5</td>
<td>600</td>
<td>104</td>
<td>9 lb. 12 oz.</td>
</tr>
<tr>
<td>DA1F</td>
<td>4 1/2&quot;</td>
<td>25</td>
<td>540</td>
<td>243</td>
<td>11 lb. 8 oz.</td>
</tr>
<tr>
<td>DA7A</td>
<td>5 1/4&quot;</td>
<td>26.5</td>
<td>1050</td>
<td>420</td>
<td>26 lb. 10 oz.</td>
</tr>
</tbody>
</table>

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Half wave type rectifier assembled in plastic case with mounting extensions. Maximum AC input 25 volts, maximum DC current output 3000 amperes.

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Electronics Buyers' Guide — June, 1947 — Mid-Month
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THESE DESIGN FEATURES are planned for superior performance.

- One-piece moving member of heat-treated beryllium copper; tongue ribbed for maximum stability
- Folded flat spring exerts high contact pressure and produces instant traverse
- Non-rotatable button assures application of actuating force to same spot on tongue throughout life of switch
- Molded phenolic case permanently sealed together in assembly
- Contacts of pure silver laminated on copper; moving contact has low mass for minimum contact bounce
- One mounting hole elongated for convenience in production assemblies
- Electrical ratings: 15 amp. 125 volts; 5 amp. 250 volts; 1/4 H P, 115-460 volts 60 cycles; all units S. P. D. T.

UNIMAX uniformity of mechanical characteristics simplifies production of precision apparatus by making possible the installation of switches without need for individual adjustment of associated apparatus. Run-of-lot switches are interchangeably usable both among units in any shipment or from several different shipments.

The UNIMAX Design Kit... an assortment of three basic Unimax precision switches, five Adaptaplates, and accessories... is ideal for checking designs and for building prototypes, giving the designer and the model builder an immediate answer to the question, "What switch is best?" Complete kit costs only $2.75; order yours today!

UNIMAX is a compact, snap-action electric switch embodying unique advantages that extend the utility of millibreak switches.

Maximum adaptability to diverse applications is obtainable, with minimum stocks, by virtue of removable, interchangeable, auxiliary actuators. This unique UNIMAX feature cuts inventories by allowing the basic switch to be adapted to varied uses by auxiliaries added in factory assembly or to be stocked separately. Further simplification of inventory results from the fact that every UNIMAX Precision Switch can be used for any of the three standard single-pole circuits.

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1. Each actuator—leaf or plunger type—is secured to a stainless steel mounting plate so that maximum strength is obtained.
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BUYERS' GUIDE

THE REFERENCE BOOK OF THE ELECTRONIC DESIGN ENGINEER
Shown on this page are some of the types of relays designed, developed and manufactured by Allied. In addition to these, there are many others, plus variations of these types for special applications.

Type SK
The SK relay for DC is an improved version of the small telephone types. As the illustration above indicates, although the SK occupies less area than most relays of this type it features a larger coil. Another plus feature of the SK is the novel hinge arrangement which improves the magnetic circuit. Various arrangements and several types of insulation are available. Normal power rating .500 watts. Contact rating is 1 amperes at 24 volts DC or 115 volts AC, non-inductive. Approximate maximum weight 2-1/8 ounces. Length 1-17/32". Maximum height 1-17/32". Width 31/32".

Type AS
The AS single pole relay is a small, light, medium power relay. It has a nominal power rating of 1 watt. The AS is insulated from the frame. Another version, the AR, is alike in all characteristics except that it is grounded to the frame. The AS has many applications in all types of controls and is available in AC or DC. Contact arrangement is normally open, normally closed or double throw. Contact rating is 5 amperes at 24 volts DC or 5 amperes at 115 volts AC. Weight 7 ounces. Length 2-1/4". Height 1-3/4". Width 1-3/8".

Type B
The B is a single pole sensitive type relay particularly adaptable to applications where the source of power is limited. The base is of wax impregnated molded bakelite. Contact gap and spring tension are adjustable in the field. The magnetic structure of the B relay is a special heat treated alloy. Nominal rating .012 watts. Available AC or DC. Contact arrangement normally open, normally closed or double throw. Contact rating is 2 amperes at 24 volts DC or 5 amperes at 115 volts AC. Weight 7 ounces. Length 2-1/4". Height 1-3/4". Width 2-3/8".

Type F
The F relay is a single pole relay for DC particularly adaptable in applications where space is limited. Bakelite insulation is used. May be supplied with other contact combinations. Silver is standard contact material, alloy contacts can be substituted. Contact rating is 3 amperes at 24 volts DC or 115 volts AC non-inductive. Nominal power rating is .750 watts. Weight 1-7/8 ounces. Length 1-3/16". Height 2-1/16. Weight 1-3/16".

Type UB
The UB relay is an improved multiple-type relay which has many applications because of its ruggedness and ability to operate even under severe service requirements. The UB is available with a number of contact arrangements up to 4 pole double throw and is available in either AC or DC. Nominal power rating is approximately 2-1/2 watts, depending on the pile-up arrangement. Standard contacts are rated at 15 amperes at 24 volts DC or 115 volts AC non-inductive. Weight 6 ounces. Length 2-9/16". Height 2-11/16". Width 1-1/16".

Type BO
The BO relay is an all purpose, industrial type relay. Like other Allied types it is ruggedly designed, yet features compactness and minimum weight. This relay utilizes molded bakelite insulation throughout. The BO can be furnished for AC or DC double pole normally open, normally closed, double throw. Nominal rating 2.5 watts. A three and four pole combination is available which is known as the PO-9 and PO-12. Contact rating is 15 amperes at 24 volts AC or 110 volts DC, non-inductive. Weight 4 oz. Length 1-3/8". Height 1-7/8". Width 1-13/32".

Type UB
The Type UB relay is an improved multiple-type relay which has many applications because of its ruggedness and ability to operate even under severe service requirements. The UB is available with a number of contact arrangements up to 4 pole double throw and is available in either AC or DC. Nominal power rating is approximately 2-1/2 watts, depending on the pile-up arrangement. Standard contacts are rated at 15 amperes at 24 volts DC or 115 volts AC non-inductive. Weight 6 ounces. Length 2-9/16". Height 2-11/16". Width 1-1/16".

For complete information on these and other Allied Relays, write for the new catalog.
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FOLDING HANDSET
Style 197/9197
All-positional lightweight pocket-size folding handset. Replaceable carbon type unit uniform response, moisture-proofed, altitude and temperature-compensated. 300-ohm lightweight receiver of uniflux design, damped response, moisture-proofed. Built-in press-to-talk switch, single pole, single throw. Fully adjustable stainless steel handle. 4' neoprene jacketed 4-conductor cord.

HEADGEAR
Style 293
This device frees the operator's hands for manual operations. It's Aviometer's exclusively. All-positional anti-noise response, adjustable boom-supported lip microphone.

HANDSET
Style 333
Handsets of streamlined sturdy construction with replaceable cartridge-type microphones and receiver. Types include carbon, magnetic. Hanger is style 311. Can be furnished to your specification on short notice.

HEADSET
Style 109

HAND HELD MICROPHONE
Style 631
Hand held microphone with built-in press-to-talk switch.
A sturdy, light, reliable unit in satin-finish, high-impact strength, molded bakelite case, featuring long life and convenient economical maintenance by use of factory-sealed components. Performs with unusual clarity due to extended frequency response and full modulation of carrier.

Catalog On Request
Moldite permeability tuning cores are manufactured to meet the most precise requirements. Modern mass production methods of manufacturing perm cores have resulted in increased quality and economy to our customers. Perm cores with screw, wire and hook inserts are produced to smoothly fit the design of all perm-tuning units.

Moldite magnetic iron cores are manufactured to exact specification with an exclusive powder mix to fit detailed requirements at audio, broadcast, FM and television frequencies. New formulae and methods of processing increase Q values; result in greater stability and density. Moldite cores are manufactured under rigid quality control.

**CLASSIFICATION OF POPULAR MOLDITE IRON CORE MATERIALS**

11A High permeability with medium Q in the audio and low frequency range. This material can be molded into any piece and is, therefore, suitable for permeability tuning replacing the expensive variable condenser. Good results in loading coils exhibiting an effective permeability up to 50 and higher.

12L An all purpose core material. Medium-high permeability, High Q for use in antenna or R.F. circuits up to and including 5 M.C. Eddy currents and hysteresis losses are kept to a minimum.

13Y Medium-low permeability, high Q should be specified when highest Q attainable is required at frequencies above 3 M.C. Excellent heat stability and constancy of permeability.

15T A low frequency material with low permeability, medium Q. Used extensively in IF transformers. A low cost core material.

16Y Medium-high permeability, high Q especially applicable for use in antenna or R.F. circuits, high quality IF transformers.

17T Similar to 16Y. Should be specified when improved Q is required. Particularly suitable for high frequency cores.

19B Low permeability, exceptional characteristics at high frequencies from 50-150 M.C. especially between 50 and 100 M.C. where high Q and satisfactory permeability is required to cover a bank of 10 M.C.

20D High permeability (slightly higher than 23Y). Low Q factor about equal to air. 200 is used in IF transformers and oscillator circuits for push-button controlled receivers. A low frequency material.

23Y High permeability (slightly lower than 11A). Medium-low Q. Used for permeability tuning in broadcasting range and in antenna, R.F. and IF for improving Q. Lower in cost than 11A.

24L High permeability (slightly higher than 1IA), low Q. A low frequency material especially recommended for frequencies below 100 K.C. Low in cost.

29Y This powder is used in fixed cores for 1F applications where better Q than 23 Y is desired. Permeability equal to 23Y, Q higher.

30Y For permeability tuning and fixed cores in frequency range from 1.5 to 50 M.C. Lower in cost than 11A.

**STANDARD MOLDITE IRON CORES OFFER REAL ECONOMY**

As a result of long experience in the production of iron cores to hundreds of customers' specifications MOLDITE engineers have been able to standardize many types for volume production. These standard types can, in many cases, be applied in place of a custom designed core and substantial savings realized. Thespecifications and data below may be conveniently used in checking your requirements against available standard types.
Conant Instrument Rectifiers

SPECIFICATIONS (STANDARD TYPES)

| Type | Internal Circuit | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z |
| M 500 | 3.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| HS 500 | 3.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| T 500 | 3.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| H 500 | 3.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

Over ninety per cent of all rectifier requirements are served by 12 types—4 basic assemblies in 3 series. These 3 series are the three primary units of Conant rectifiers. Special types, however, can be developed as needed, and you'll find Conant ready to cooperate.

SERIES 500 UNITS are for general applications requiring greater output current for meters, relays or other apparatus requiring more than 1 milliampere. Recommended for all such applications at commercial and the lower audio frequencies. Will also operate up to 50,000 c.p.s. in special applications wherein accuracy of readings is not essential.

SERIES 160 and 160-C are for applications requiring good frequency response over the entire commercial and audio range and especially when the meter, relay or other apparatus requires less than 1 milliampere for operation. In some special applications the units may be operated at frequencies up to 15,000,000 c.p.s. with special circuit treatment.

SPECIAL TYPES are available in both series 500 and 160-C. When requesting a quotation on a special type include a sketch of the rectifier required or a circuit diagram showing source and frequency of the input voltage, resistance and kind of load, required load current and the ambient temperature.

SERIES 500 Disc diameter .500 inch. Area each disc .15 square inch. Furnished with 3" braided, tinned copper leads. Finished in clear lacquer. Nickel plated end plates.

SERIES 160 Disc diameter .160 inch. Area each disc .02 square inch. Furnished with 3" stranded, tinned double silk covered copper leads. Nickel plated case. Assembly sealed with specially developed moisture proof compound.

SERIES 160-C Disc diameter .160 inch. Disc area, lead wire and length and moisture proof seal are identical with Series 160. Dimensions of the nickel plated case have been reduced to the most compact size. These units may be mounted in a standard midget fuse clip.

Conant Instrument Rectifiers are available from leading radio jobbers everywhere—consult your local jobber.

CONANT INSTRUMENT RECTIFIERS

6500 0 STREET, LINCOLN 5, NEBRASKA, U.S.A.

June, 1947—MID-MONTH—ELECTRONICS BUYERS' GUIDE
BAER FACILITIES are modern and adequate in every respect—stamping, punching, machining, sawing and drilling are accomplished accurately, efficiently and economically. Through long experience and specialization in this field, BAER fibre fabrications embody a high degree of precision and craftsmanship. Complete familiarity with extremely close tolerance operations, strict adherence to specifications, and a thorough understanding of all basic problems involved, typify BAER capabilities.

Tools, dies, jigs, etc. are designed and made in the BAER plant by production engineers who "follow through" from blueprint or sketch stage to final production.

Check the relative properties and characteristics of vulcanized fibre and phenol fibre for your fabrication purposes. Each offers specific advantages for particular applications. In doubt, BAER engineers will gladly collaborate in the solution of your problems. Inquiries are invited and estimates will be gladly given without obligation.

VU5-57 MINIMUM DIELECTRIC STRENGTH OF VULCANIZED FIBRE SHEETS

<table>
<thead>
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<th>Nominal Thickness</th>
<th>Volts per Mil</th>
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<td>200</td>
</tr>
<tr>
<td>.005 to .015 in.</td>
<td>300</td>
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<tr>
<td>.015 to .040 in.</td>
<td>250</td>
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<tr>
<td>.040 to 1/8 in.</td>
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STANDARD GRADES OF PHENOL FIBRE SHEETS

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimum Standard Physical Strength (Lb per sq. in.)</th>
<th>Maximum Standard Diellectic Losses at 110° Cycles</th>
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</thead>
<tbody>
<tr>
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<td>10000</td>
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<tr>
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<td>None</td>
</tr>
<tr>
<td>AA</td>
<td>6500</td>
<td>None</td>
</tr>
</tbody>
</table>

NOTE 1: Dielectric Strength and Water Absorption values vary greatly with thickness. For other thicknesses than 1/16 in., consult standards.

TABLES ARE FROM N.E.M.A. STANDARDS

N. S. BAER COMPANY
9-11 MONTGOMERY ST. HILLSIDE, NEW JERSEY

ELECTRONICS BUYERS' GUIDE—June, 1947—MID-MONTH
"A Well Known Name in Radio for Over 25 Years"

Carter
...instant power for GENERAL ELECTRIC 30 w Transmitter

X marks the spot where INSTANT power starts (in 3/10 second) from the CARTER GENE-MOTOR employed in GENERAL ELECTRIC's 30 watt, 30-40 mc transmitter. Another example where leading communication manufacturers specify CARTER for reliable power. Only CARTER GENE-MOTOR is guaranteed to deliver over 100,000 service-free transmissions. Write for catalog.

2646 N. MAPLEWOOD AVENUE • CABLE: GENEMOTOR

ACOUSTICAL MEASUREMENTS made easily, accurately, and efficiently with HIGH SPEED GRAPHIC RECORDER

A unique, versatile instrument for the acoustical engineer. Interchangeable input potentiometers in various ranges (log DB, linear, phon).

MODEL PL
• Reverberation Time
• Decay of Sound
• Sound Intensities
• Loudness

Write for technical data

DESIGNERS & MFRS. OF GRAPHIC RECORDING INSTRUMENTS

SOUND APPARATUS CO.
233 BROADWAY • NEW YORK 7, N.Y.

METAL STAMPINGS
DKE

DKE stamped metal parts can now be supplied in any quantity on short notice. Twenty years experience in producing all types of cups, sleeves, flanged shapes, and fabrications to specification. Tools, jigs, fixtures produced on premises for precision and economy.

INQUIRIES INVITED
THE ENGINEERING CO.
DANIEL KONDAKJIAN
27 WRIGHT ST., NEWARK, N.J.

A limited quantity of reprints of this BUYERS' GUIDE is available at $2.00 per copy (Directory Section only)

REQUESTS for additional copies, sent on company letterhead and addressed to ELECTRONICS, Dept. BGR, 330 W. 42nd St., N. Y. 18, will be taken care of promptly.

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
Here's the Helipot Principle that is Revolutionizing Potentiometer Control in Today's Electronic Circuits

Conventional potentiometers have a coil diameter of approximately 1/2" and provide only 4" (about 300°) of potentiometer slide wire control. The Beckman Helipot has the same coil diameter, yet gives up to 46" (3600°) of potentiometer slide wire control—nearly TWELVE times as much!

Helipots are available in 3 standard sizes:

**TYPE A**—5 watts, incorporating 10 helical turns and a slide wire length of 46 inches, case diameter 1 1/4", is available with resistance values from 10 ohms to 50,000 ohms.

**TYPE B**—10 watts, with 15 helical turns and 140" slide wire, case diameter 3 1/4", is available with resistance values from 50 ohms to 200,000 ohms.

**TYPE C**—2 watts, with 3 helical turns and 12 1/2" slide wire, case diameter 1 1/4", available in resistances from 5 ohms to 15,000 ohms.

...AND IN SPECIAL SIZES. The Type B is also available in special sizes of 35 and 40 helical turns, with resistances ranging from 100 ohms to 500,000 ohms, and containing more than 100,000 change-of-resistance steps.

*Helipot* is the trademark of the HELicoidal POTentiometer. *(Registered U. S. Patent Office)*

Some of the multiple Helipot advantages

Extensively used on precision electronic equipment during the war, the Helipot is today being adopted by more and more manufacturers of quality electronic equipment to increase the accuracy, convenience and utility of their instruments. By coiling the resistance wire into a helix upon which the slider contact travels from end to end as the shaft is rotated, the Helipot permits an unusually long resistance wire to be incorporated into a potentiometer unit that requires no more panel space than conventional single-turn potentiometers.

The Helipot makes possible much finer adjustment of circuits and far greater accuracy in resistance control. Moreover, it permits simplifying control and eliminating extra knobs, extra operations, extra complications on the instrument panel.

Through development of the new Beckman Duodial, resistance measurements with the Helipot are unusually simple. This compact dial fastens directly to the shaft of the Helipot and automatically indicates both the radial position of the slider contact on each individual coil as well as the position of the slider on the coiled helix.

The Helipot is available in a wide range of types and resistances to meet the requirements of many applications, and its versatile design permits ready adaptation of a variety of special features, as may be called for in meeting new problems of resistance control. Let us study your potentiometer-cheostat problems and make recommendations on the application of Helipot advantages to your equipment. No obligation of course. Write today.

Send for the New Helipot Booklet. Also ask for information on the new Beckman Duodial!
The science of electronics is so broad and so varied that any definition must depend largely on its specific application. While the basic principle of operation depends on the electron as the source of energy, the application is as varied as the problem to be solved.

Shown here are many Westinghouse electronic devices; more detailed and specific information about equipment and applications can be supplied on request.

**RADIO BROADCAST TRANSMITTERS**

**AM TRANSMITTERS.** Twenty-five years of experience in the operation of broadcast stations is incorporated in Westinghouse 5, 10, and 50 kw AM Transmitters. The transmitters feature surge-proof metal rectifiers, metal-cored tubes, showing operating condition at all times; completely fuseless overload protection, with automatic reset after interruptions; air-cooled tubes, with cooling system operation from a single blower; fireproof and explosion-proof transformers and reactors. Cubicle construction simplifies installation of the transmitters; 5 and 10 kw transmitters consist of three cubicles and the 50 kw transmitter of eight cubicles which may be installed "in line" or in unit groups to meet layout requirements.

**FM TRANSMITTERS.** Designed to meet operators' requirements, Westinghouse 1, 3 and 10 kw FM transmitters are backed by many years' experience in operating five FM broadcast stations. Outstanding features include accessibility of all tubes from front of transmitter; self-contained transmitter, with no external parts; aluminum cubicle, improving shielding and reducing weight; Class "B" temperature insulated transformers; two complete crystal oscillators; completely electronic frequency control, without moving parts or critically tuned circuits; and an individual meter in each important circuit.

**ACCESSORY EQUIPMENT.** FM antennas and transmission lines, transmitter consoles, speech input equipment, antenna phasing, branching, and coupling equipment, tower lighting, and spare parts are also available.

**POWER LINE CARRIER**

Power Line Carrier is a specialized adaptation of radio wherein high frequency (50 to 150 kc) currents are sent over transmission lines without impairing normal flow of power. Power line carrier is used for communications, relaying, tele-metering, load control and supervisory control. Features include full-length, swing-out type control panel to permit complete and easy access to all internal components from the front of cabinet, and single sideband circuit, doubling the number of carrier channels, reducing the signal to noise ratio 8 to 1 over standard AM carrier, and eliminating corona modulation by absence of carrier wave. Individual application requirements are met with the new type JY equipment, which is built up from co-ordinated units to give great flexibility. Single sideband power line carrier is an exclusive Westinghouse product.

**RAILROAD RADIO**

Railroad radio provides instant three-way communication between engine, wayside station, and another train. Recent applications to tugboats have also proved highly efficient and economical. Improved FM circuits and automatic controls assure noise-free, undistorted communication. No wayside wires are needed. Westinghouse railroad radio is unaffected by adverse weather conditions such as extreme heat, ice, sleet, rain, or snow. Equipment operates from 117 volts a-c, with rotary converters provided for mobile units. Transmitter and receiver chassis are fully interchangeable between fixed and mobile stations, thus simplifying replacement problems.

**X-RAY**

"Micronex" is the latest development in Westinghouse industrial x-ray units. It is designed for ultra-high-speed radiography, taking pictures at .000001 of a second, with sufficiently high intensity to photograph through one inch steel plate. Micronex converts low voltage (power available at a standard outlet) to high-energy, short-duration surge to actuate the x-ray tube. Micronex is portable, can be moved easily on large rubber-tired casters. It is used in ballistics for the study of projectile flight and impact, investigating internal conditions of high speed motors, and in the study of high rpm rotating equipment and dust in flight.

**RADIO FREQUENCY GENERATORS**

Standard Westinghouse radio frequency generators suitable for either induction or dielectric heating are made in 2, 5, 10 and 20 kw ratings as stock items—with 50, 100 and 200 kw standard designs built to order. Most applications can be met with stock generators, and Westinghouse engineers will work out problems where higher capacities are needed. All units have automatic timing controls to permit adjustment of the load cycle to a predetermined time which may be repeated with absolute accuracy by simply pressing a button. All equipment is shielded to minimize radiation losses, air-cooled to reduce maintenance, and shock mounted to assure maximum tube life and quiet operation.

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
MOT-O-TROL (Motor Speed Control)

Mot-o-trol employs the precision of electronics to provide a wide (80:1) stepless range of speed control for d-c motors from an a-c source. The system is based on a thyatron tube, which takes power from an a-c input and rectifies it to d-c for use by a regular shunt wound d-c motor. The Mot-o-trol provides smooth, rapid acceleration to preset speed, stepless control over a wide range of speeds with excellent regulation over the entire range, dynamic breaking, and reversing. Control for speed variations, starting, stopping and reversing are on the control station. Four pieces are involved—power transformer, electronic control cabinet, control station, and the d-c motor.

RESISTANCE WELDING CONTROL

The Westinghouse Type AC fully electronic resistance welding control for welder side mounting combines in a single unit exceptionally accurate and precise control for seam, pulsation-spot, and spot welding. Heat selecting dial gives stepless adjustment of the welding current from 20% to 100% of maximum current on 440 to 550 volts, and 40% to 100% on a 220 volt supply. The normal time adjustment is from 1 to 30 cycles in 1 cycle steps for "weld" and "off" time in seam welding and "heat" and "cool" time in pulsation or spot welding. From 1 to 15 pulsations may be selected for pulsation welding.

OSCILLOGRAPH

The Electronic Oscillograph is an instrument recording extremely short, single electrical transients with respect to time, or two electrical phenomena with respect to each other. The new streamlined unit is completely self-contained and consists of a cabinet which houses all the energizing and control circuits. In addition to the fluorescent screen for direct observation, the instrument contains a stationary film for recording electrical phenomena lasting 1/100,000 of a second or less. For phenomena lasting from 1/1000 to 1/10 of a second, where longer oscillograms are desired, a rotating film drum is used.

PHOTO-TROLLER (Photo-electric Relays)

Photo-trollers are general purpose photo-electric relays operated by an increase or decrease in the amount of light falling on a phototube. They are arranged to initiate an electrical sequence in response to changes of illumination caused by partially or completely breaking a light source. Type RX-1 (illustrated) is for general purpose indoor industrial applications where the change in light on the phototube is more than 50% and where less than 150 operations per minute with equal "off—on" periods are required. It may be used up to 40 feet maximum distance.

BALANCING EQUIPMENT

Dynamic and Dynetric Balancing Apparatus accurately indicates the amount and location of unbalance in two or more selected planes of a rotating machine, determining the amount of correction necessary to balance the equipment.

TYPE HQ (Dynamic) portable unit (illustrated) employs velocity type vibration pickup with dynamometer type wattmeter and sine wave generator.

TYPE U (Dynetric)* uses an electromagnetic pickup with wattmeter and generator.

TYPE S (Dynetric)* stroboscopically locates unbalance and indicates amount of correction to be made.

*Information on dynetric equipment may be obtained from Gisholt Machine Company, Madison, Wisconsin.

OTHER WESTINGHOUSE ELECTRONIC DEVICES

NAVIGATIONAL RADAR. Provides navigational and anti-collision protection in fog, darkness, and all other varieties of bad weather for deep water vessels of both freight and passenger types. It has a range of 100 yards to 32 miles.

STROBOGLOW. A power unit and a lamp unit with electronic amplifier and timing tubes which literally "freezes" motion and makes rapidly rotating objects stand still so that they can be studied and visualized.

STRAIN GAUGE. Vibration fatigue equipment generates from 10 to 10,000 electronic impulses per second to test the resonant frequency of structural and rotating parts.

FURNATRON. Electronic control system for electric resistance heated furnaces maintains required constant temperature level.

PINHOLE DETECTOR. A phototube application for spotting and marking holes as small as 1/64 of an inch.

PRECIPITRON*. An electrostatic air-cleaning device which will remove upwards of 85% of airborne dirt and dust.

IGNITRON RECTIFIER. A power conversion electronic device utilizing the rectifying property of the mercury vapor arc.

VISICODE SUPERVISORY CONTROL. Remote control for various kinds of substations such as those used on electric power transmission and distribution systems.

*Trade mark registered.
LAMITEX Affords the Best Combination
In Both High Dielectric and Mechanical Strength

Indicated by arrows:

★ LINEN LAMITEX precision sprocket for motion picture developing apparatus is used extensively immersed in developing hypo without affecting its dimensional stability. High mechanical strength of small teeth, and their resistance to wear, is a particular advantage.

★ LINEN LAMITEX automotive distributor breaker-arm not only provides electrical insulation and inherent resistance to wear, but also reduces to a minimum wear of companion steel cam.

★ LAMITEX GRADE XXXP coil forms used in communication and radio circuits where low moisture absorption and high dielectric strength is a vital factor.

★ LAMITEX GRADE XXP punched base for automotive cut-out in battery-generator circuit. Provides suitable mechanical and high dielectric qualities for this important application.

FRANKLIN LAMITEX and VULCANIZED FIBRE

In Sheets, Rods and Tubes, Fabricated or Molded Parts

Low moisture absorption is only one of many advantages you get when FRANKLIN'S LAMITEX is specified for your job. This versatile material is highly machineable, or if you lack the proper facilities we will fabricate the parts for you. Both LAMITEX and FIBRE can be drilled, tapped, turned, threaded, punched, shaved, bored, reamed, sawed, milled or completely fabricated into automatic screw machine parts.

Send for Catalog Containing Complete Data

Check these FRANKLIN LAMITEX Characteristics

- High dielectric strength
- Low power factor
- Low moisture absorption
- Remarkable dimensional stability
- High mechanical strength
- Low coefficient of thermal expansion
- Low in weight (about half that of aluminum)
- Unaffected by solvents and oils, most organic acids, dilute mineral acids or salt solutions.
BUILDERS OF COMMUNICATIONS EQUIPMENT, MEASURING INSTRUMENTS FOR COMMERCIAL AND INDUSTRIAL USE, AND OTHER ELECTRONIC DEVICES—PRODUCTS WHERE PRECISION PERFORMANCE LARGELY DEPENDS UPON TIME AS A FACTOR OF CONTROL—KNOW THEY can rely on Cramer DESIGN QUALITY ACCURACY

RUNNING TIME METERS
Synchronous motor driven. Register automatically and cumulatively total operating or idle time on circuits, machines, systems.

TIME DELAY RELAYS
Provide adjustable or fixed time delay between operation of a control circuit and subsequent opening or closing of a load circuit.

SYNCHRONOUS MOTORS
Permanent magnet type for applications requiring a constant speed at a given frequency. Small size. 30" ounce torque. Twenty-eight speeds from 60 rpm to 1/24 rph.

For a wide range of standard timers and controls, or special adaptations for specific applications, consult R.W. CRAMER CO., Box No. 3, Centerbrook, Conn.

SPECIALISTS IN TIME AS A FACTOR OF CONTROL

Allied Professional Recording Discs are manufactured to exacting standards by one of the pioneers in the field of instantaneous recording equipment. The accumulated knowledge of years of experience have been engineered into Allied Discs. TRY them.

Also ALLIED RECORDING EQUIPMENT

The Allied Recording Machine (illustrated) combines the Allied Transcription Turntable and Allied Overhead Cutting Assembly, which are also sold separately. Like Allied Discs, this equipment is of highest precision quality, good for long, trouble-free service.

ALLIED RECORDING PRODUCTS CO.
21-09 43rd AVENUE
LONG ISLAND CITY 1, NEW YORK
WRITE FOR NEW DESCRIPTIVE BULLETIN

ELECTRONICS BUYERS’ GUIDE—June, 1947—MID-MONTH
The part of the entire cost of an electronic product which is represented by its insulation is indeed small. On the other hand, the insulation is perhaps the most vital non-operating part of the product! This is borne out by an analysis of failures in electrical apparatus which shows that where failures did occur, 85% of the failures were due to faulty insulation. The facts make it evident, therefore, that nothing but the best in insulation can be risked in today's electrical products if consumer-dealer trust is to be retained. This is the William Brand policy which has motivated the development of TURBO Varnished Tubings, Sleevings and other insulation materials.

Flexible Varnished Tubing

A braided cotton sleeve insulation processed "in the round" to secure precise form fitting diameter throughout length. Thoroughly saturated with flexible insulating varnishes baked-in all the way through to the inside. Recommended for high tensile strength, flexibility, non-peeling and non-cracking qualities, low moisture absorption, oil and acid resistance and slow burning quality.

MAGNETO GRADE—7000 V dielectric breakdown

RADIO GRADE—4000 V dielectric breakdown

SATURATED SLEEVING

A select cotton braided sleeving similar in construction to varnished tubing — rounded in the braided form to assure accuracy and conformity to sizes as listed.

An all-purpose sleeve insulator useful in all cases except in the higher dielectric ranges. Flexible, high tensile strength, low moisture absorption, acid and oil resistant, slow burning.

1200 V. minimum dielectric breakdown

Fibrous Glass Tubing

A braided insulator fabricated of fibrous glass yarn and processed with TURBO insulating varnishes. The natural insulating property of glass is thus reinforced by the varnish coatings to yield a near ideal dielectric.

Use where exceptionally severe conditions of heat or electrical characteristics or both prevail. Consider use also in complex or "miniature" circuits where space is a factor. Gives optimum protection with least bulk.

The New Standard Sizes follow the B. & S. System of Gauging Bare Wire. Therefore if tubing is to be used on covered wire, the proper allowance must be made for the thickness of the insulation. Standard strand length 42 in. — bundled 120 strands.
A homogeneous vinylite resin plastic sleeving formed on automatic extrusion presses. Inside and outside diameters held to close dimensional tolerances.

Recommended particularly for low temperature and variable temperature service. Exceptionally high resistance to embrittlement under sub-zero temperatures. Also valuable for its high dielectric values and low moisture absorption. Stretch factor 2 1/2 to 1.

<table>
<thead>
<tr>
<th>No. diam., in.</th>
<th>No. diam., in.</th>
<th>Approx. inside</th>
<th>Approx. inside</th>
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<td>3/4</td>
<td>.750</td>
</tr>
<tr>
<td>9</td>
<td>.118</td>
<td>7/8</td>
<td>.875</td>
</tr>
<tr>
<td>8</td>
<td>.133</td>
<td>1</td>
<td>1.000</td>
</tr>
<tr>
<td>7</td>
<td>.168</td>
<td>1 1/16</td>
<td>1.0625</td>
</tr>
<tr>
<td>6</td>
<td>.166</td>
<td>1 1/4</td>
<td>1.250</td>
</tr>
<tr>
<td>5</td>
<td>.186</td>
<td>1 1/2</td>
<td>1.500</td>
</tr>
</tbody>
</table>

Lengths - Continuous lengths of 100 ft. up to No. 6, 50 ft. from No. 6, larger sizes 25-ft. lengths. Colors - Standard: Black, Yellow, Red, Green, Blue and White, also Transparent.

Slip-on sleeves fabricated from various materials such as woven fabrics and extruded plastics and imprinted longitudinally or circumferentially in any diameter or length in any combination of colors.

To identify electrical conductors or, in fact, any tubing, wiring, rod, pipe, hose, cable or connection. Dimensioned to precise limits to insure snug fit.

Two types — standard sleeve and tub-type. The latter is recommended for use on extremely fine diameter wires. Sizes - as required.

Mica comprises a group of natural silicates distinguished by highly developed basal cleavage into thin, tough, flexible laminations. Used as electrical insulation, mica possesses ideal electrical properties.

Grades

- **Heater Plate** - For direct contact with high heat. Temperature resistance: 1000°F. Average dielectric strength - 625 V.P.M.
- **Flexible Plate** - Flexible plastic and moldable at ordinary temperatures. Temp. range (Mail) 275°F. Average dielectric strength - 525 V.P.M.
- **Segment Plate** - Soft edged surface matched to wear with copper commutator bars. Dielectric strength - 625 V.P.M.
- **Molding Plate** - Becomes flexible and pliable to a moldable degree at 24°F without cracking or flaking. Dielectric strength - 600 VPM on Flat Sheets.
- **India Segment Plate** - Similar to segment plate but harder and has higher thermal characteristics.
- **B-41 and 2 Plate** - A built-up mica plate. High rigidity and temperature resistance (362°F) without swelling, softening or delamination. Recommended to replace virgin mica in less exacting applications for capacitor separators and backing plates.
- **Block Mica** - Rigidly held to quality classification standards; complete range of standard sizes.
- **Mica Films** - For mica condensers. Virgin mica rigidly gauged and classified.

A solid or stranded conductor over which has been extruded a homogeneous vinylite plastic sheathing.

Offers great resistance to high temperatures, especially those encountered in soldering or potting operations. Has high resistance to oils, organic solvents, acids, alkalies, sunlight and oxidation.

High dielectric values — in excess of 1000 voltage breakdown strength per 1/1000 inch.

Fine gauges, Nos. 16 to 30 solid or stranded conductor.
FABRICATED SHEET
METAL PRODUCTS
to your specifications . . .

COMPLETE facilities under one roof
for quantity mass production—includ-
ing welding, baking and finishing, Whistler and Wiedemann equip-
ment for short runs. Tool and die en-
geineering and designing.

Substantial sheet steel inventories
permit speed, service and cooperation.
Large assortment of stock and special
dies for the radio and electronic field.
Production and engineering under the
personal direction of Mr. E. B. Gunz-
burg, president—who has had 33
years’ experience in sheet metal fab-
rication.

Send your blueprints and requests for prompt attention and quotations.
ART-LLOYD METAL PRODUCTS CORP.
2973 Cropsey Ave.
Brooklyn 14, N. Y.

E-I HERMETICALLY-SEALED
MULTIPLE HEADERS
★ VACUUM TIGHT SEAL
★ KOVAR METAL ELECTRODES
★ PYREX GLASS BEAD
★ MANY STANDARD TYPES
★ ANY TYPE TO SPECIFICATIONS
★ SOLDER OR WELD EASILY

A complete and diversified line of E-I 4, 5, 6, 7 and 8 elec-
trade hermetically sealed Multiple Headers are now available
as standard stock items. All are supplied at mass production
prices—no special tool or die costs involved. Individual sealed
terminals are also included in a wide variety of standardized
types. All special shapes or forms can be supplied to exact
specifications at slightly higher cost.

All include Pyrex glass bead—immune to thermal or electrical
shock. Pyrex annealed to eliminate strain. Kovar electrode and
shell solders and welds easily and forms absolute vacuum
tight chemical bond with glass—lead becomes integral part
of housing. Multiple Headers can be fabricated in any form to
specification—write today.

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INDUSTRIES • INC.
42 SUMMER AVENUE, NEWARK 4, N. J.

the
electronics
buyers’
guide
has been
designed to
serve all types
of electronic
engineers . . . .

QUICKLY
ACCURATELY
and
CONVENIENTLY

Use it for
Quick
Reference
as you work

June, 1947 — MID-MONTH — ELECTRONICS BUYERS’ GUIDE
Presto Recording Equipment

The Presto 6-N recording turntable is used in broadcasting stations and instantaneous recording studios. It includes all the basic equipment needed to make recording of commercial quality.

The overhead cutting mechanism has been designed so that it is removable as a unit from the turntable and fits in a pocket inside the carrying case for safer transportation. The overhead cutting mechanism includes the 1-D high fidelity cutting head and spiraling feed screw. Illustration shows only one sample of full line.

Send for complete information

Brush Magnetic Ribbon Recorder

By merely pushing a button you can accurately transcribe half an hour of music or speech. Then with a pair of scissors and some cellulose tape, you can edit the program, eliminating any parts of it you don't wish to keep. Even if you play this ribbon transcription several thousands of times it will never deteriorate but will always present exactly the same perfect reproduction. Or, if any time you don't want that program any more, you can "erase" it electronically just by pushing another button. The multidirectional microphone that comes with every "Soundmirror" enables you to record forever anything you can hear, just exactly as you heard it.

Specifications

Frequency Response: 100 cps. to 5000 cps.
Signal to Noise Ratio: at least 40 db.
Rewind Speed: Approx. 30-1'
Recording Time: 115 volts, 50/60 cycles
Power Rating: Record 148w, Playback 113w
Power Consumption: 1/2 hr.
Net Wt.: 40 lbs.

The Perfect Pierce Wire Recorder

- 66 minutes of continuous recordings on wire.
- High speed recording.
- High fidelity response.
- Flat ± 3db from 200 to 5000 cycles.
- Records speech, music on a fine steel wire.
- Reproduces immediately.

Representing
Altec-Lansing
Brush Development
Presto
Recoton
Rek-O-Kut

Sonocraft Co., Inc.

45 W. 45th St., New York 19, Bryant 9-8897

Cable Address: Craftsono
**Features:**
- Non-Inductive
- Heat-Proof
- Leads Cannot Pull Out

---

**Features:**
- Non-Inductive
- Heat-Proof
- Leads Cannot Pull Out

---

**Features:**
- Non-Inductive
- Heat-Proof
- Leads Cannot Pull Out

---

All sizes = 1/32" on O.D.
All Sizes = 1/16" on Length at added costs.

---

**NOTES:**
All P1 and P4 are flat shape. All P5 and P2 are round. All units have Bakelite Resinoid Ends. Leads cannot pull or melt out. All can be used on applications up to 90°C without damage to the capacitors.

Pats. Pending 5/47
Features:
1. Heat-Proof . . . Cannot Melt Out
2. Moisture-Proof 90-100 R.H.
3. Anchored Lead Wires
4. Much Longer Life . . . Vacuum Sealed
5. Smaller . . . Less Room

DUMONT ELECTRIC CORP. 34-54 HUBERT ST. NEW YORK, N. Y.

EMERSON MIDGET PAPER CAPACITORS

At Last ... A WARTIME DEVELOPMENT
NOW RELEASED FOR PUBLIC USE.

DUMONT DURASEALED

Features:

BAKELITE RESINOID SEALED CANNOT MELT

FOR D.C. OR A.C. AT 90° C CONTINUOUS

DUMONT ELECTRIC CORP.

CAT. MFD.

P6-1 .001 1/4 x 7/8 .40
P6-2 .002 1/4 x 7/8 .40
P6-3 .003 1/4 x 7/8 .50
P6-4 .004 1/4 x 7/8 .50
P6-5 .005 1/4 x 7/8 .60
P6-6 .006 1/4 x 7/8 .50
P6-7 .007 5/16 x 7/8 .50
P6-8 .008 5/16 x 7/8 .50
P6-9 .009 5/16 x 7/8 .50
P6-10 .01 5/16 x 7/8 .50
P6-11 .012 5/16 x 7/8 .50
P6-12 .013 5/16 x 7/8 .50
P6-13 .014 5/16 x 7/8 .50
P6-14 .01 1/2 x 1 3/8 .70
P6-15 1 3/4 x 1 3/8 .80

LIFE DRY ELECTROLYTIC Condensers now standard in the industry.

EACH CAPACITOR
Guaranteed FOR ONE YEAR
Individually boxed, for the Jobber Trade.

DUMONT ELECTROLYTICS

Features:
1. LONG LIFE ASSURED
2. MOISTUREPROOF
3. COMPACT

The DUMONT COMPANY was the first to make and produce the long life DRY ELECTROLYTIC Condensers now standard in the industry.

MFG.

DUMONT ELECTRIC CORP.
Match her skill with dependable solder

DELICATE soldering operations by skilled workers call for a solder of proven dependability. Your investment in labor-time and cost of materials should be protected—not to mention that most valuable business asset, your reputation.

You will be free from soldering comebacks and worries of all kinds when you standardize on Glaser Plastic Rosin Core Solder.

Only virgin metals go into this fine "scientific formula" solder. No vitiating "scrap" content to cut down costs, at the risk of lowering the quality of your product and injuring your good name.

Every day increases the list of prominent manufacturers who capitalize on the dependability of Glaser Plastic Rosin Core Solder and other Glaser Products.

Insist on "Glaser" when ordering solder and flux—the line that "gives you more" yet costs no more.

GLASER LEAD CO., INC.
31 Wyckoff Avenue, Brooklyn 27, N. Y.

Glaser Plastic Rosin Core solders exceed Government specifications in purity and are guaranteed to conform with A.S.T.M. Class A specifications.

OTHER GLASER PRODUCTS
Silver Brazing Solder and Flux
Fluxes for every purpose
Lead Products of every description
Lead Lining of acid and plating tanks

Our 25th year of dependable service to American Industries

Do you know that...

every electronic component or packaged equipment item is listed in the pages of this BUYERS' GUIDE...

Use it for Quick Reference as you work
This Playback Arm developed 10 years ago by our engineers has been carefully redesigned to comply with requirements of the most recent advancements in the art of high-quality reproduction. Now made of magnesium, mass has been reduced to a minimum. Yet the construction retains that solidity, stiffness, frictionless motion, and freedom from undesired resonances, so necessary with new modern low-mass highly compliant pickup cartridges.

With your favorite cartridge, such as the new G.E. Variable Reluctance, mounted in this Playback Arm you can be certain that you are obtaining optimum performance from your equipment with practically no wear on your finest records and transcriptions. Tracking problems have been virtually eliminated.

Features of the new Gray Improved Playback Arm include finely controlled adjustment of stylus pressure, virtually frictionless lateral and vertical bearings, three-point adjustable mounting for accurate leveling, extremely low basic resonance, concentration of lateral mass at stylus, minimum tangency errors, very low vertical inertia, convenient finger-lift near stylus for ease of cueing, and precision construction throughout.

The Gray Playback Arm, designed to take any modern pickup, may be purchased with or without a cartridge. Mounting radii of the three styles are consistent with dimensions of transcription tables. Model 103S illustrated above, 13” mounting radius. $35.00.

WRITE FOR ENGINEERING BULLETIN A-10

The complete line of Gray professional recording and transcription equipment includes a highly accurate synchronous gear driven two-speed turntable; an overhead Recording Drive with continuously variable pitch, automatic two-speed scroll and instant selection of direction of cut; a Dial Groove Indicator; a Record Lift; a special Sound Effects Arm with stylus light; a Sound Effects variable speed turntable.
YOU CAN DEPEND ON NEWARK

"Dealing with Newark is a 'Pleasure'." So say hundreds of outstanding men in the Radio and Electronic Field. And why? Because . . .

- NEWARK CARRIES COMPLETE STOCKS OF ALL STANDARD MAKES - Not just a few items in a few lines, but Full and Complete stocks of Standard Radio and Electronic Parts and Equipment are on hand at all times in our stores and warehouses. That's why we can supply anything you need - right from stock!
- NEWARK IS CONVENIENTLY LOCATED — With four great stores and warehouses located at central points in New York and Chicago, we are in a position to give prompt, efficient service to your requirements.
- NEWARK'S EFFICIENT STAFF — Mail, phone or wire inquiries are intelligently filled by experts who know their business and can offer helpful suggestions.
- NEWARK'S INDUSTRIAL DEPT. — Technical men who specialize in Industrial Requirements are at your service for advice, information, or to fill your orders.
- NEWARK'S SOUND DEPT. — Everything you need in PA and Sound Equipment is in stock and "On Demonstration" at our stores. "Special" equipment is designed to your requirements.
- NEWARK'S EXPORT DEPT. — Specialists who know their business will be happy to help you. We ship material to all parts of the world.
- NEWARK IS AGENCY for WAA — Acting under Contract WAS (p) 7-167, for the distribution of TRANSMITTING and SPECIAL PURPOSE TUBES, we stock the country's largest, most complete supply of tubes for Immediate Delivery at Lowest Prices.

Send your name and address for our periodic bulletin on Better Buys and New Equipment.

NEW YORK ELECTRIC COMPANY, INC.

New York City Stores: 115-17 W. 45th St. & 212 Fulton St.

INDUCTIVE COMPONENTS

- Transformers
- Saturable Reactors
- Balanced Windings
- Solenoids & Relays
- Universal Windings
- Self Supporting Coils
- Hemispherical & Tapered Shapes

Special Units to Withstand Extreme Temperatures

RECTIFIERS — INDUSTRIAL

FOR PLATING AND CONTROL PURPOSES

Your inquiry invited

NORTHERN COMMUNICATIONS MFG. CO.
210 East 40th Street

New York 16, N. Y.

YOU CAN GET IT AT NEWARK

Four large, conveniently located Newark stores and warehouses carry complete stocks at all times of all the famous makes of Radio and Electronic Equipment. Just to mention a few . . .

- ABROTT MALLORY
- AEROVOX MECC
- ALTZ LANSING MEISSNER
- AMPHENOL MILLER
- AMPHEREX MILLER
- ASTATIC NATIONAL
- ATLAS OHMRITE
- AUDIO DEVICES PERSIT
- AUDAK RADIO CITY
- BELLIN RALSTON
- BLEE KY BAYTHEON
- BROWNING REK-O-CUT
- BRUSH SHURE
- CANNON CENTRALAB SIMPSON
- CNAUDAGRAPHER SIMPLEX
- CORNWELL-DUBLION SUPREME
- DAVEN STROMBERG-CARLSON
- DUGOON SLYVANIA
- EIA MAC ABA
- ELECTRO-VOICE TAYLOR
- GAKONNATION THORDARSON
- GARRARD TRIMM
- G.F. TRIPPETT
- HALLICRAFTERS UNIVERSITY
- HAMMARLUND UTAH
- HICKOK UTC
- HYTRON WEBSTER
- JENSEN WESTON
- Phone, wire or call at your nearest Newark office for Prompt, Intelligent handling of your requirements.

Send your name and address for our periodic bulletin on Better Buys and New Equipment.

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NEWARK, I. N.

CHICAGO
323 W. Madison St., Chicago 6, Ill.

BUCK ENGINEERING CO., INC.
37-41 Marcy Street
FREEHOLD NEW JERSEY

looking for a certain electronic component with special electrical characteristics?

you’ll find it in the advertising pages of this BUYERS’ GUIDE

THE REFERENCE BOOK OF THE ELECTRONIC DESIGN ENGINEER
HIGH SPEED PREDETERMINED ELECTRONIC COUNTERS, INTERVAL TIMERS, DECIMAL SCALERS & COUNT DETECTORS

PREDETERMINED COUNTERS

- **Pre-determined counts**—of absolute accuracy
- **Counting rates**—to 20,000 per second
- **Control rates**—to 15,000 per minute
- **Automatic reset**—instantaneous at completion of count

Potter Pre-determined Electronic Counters extend the field of automatic counting and control far beyond the scope and capabilities of existing mechanical and electro-mechanical devices. There are no moving parts, therefore, wear, slippage and inertial effects are eliminated. Normal counting rate is up to 20,000 per second. Control rates run as high as 15,000 per minute and even these high speeds can be exceeded if required. Potter counters are readily applicable to any machine or process requiring the exact measurement of quantity, length, time, velocity, frequency or revolution. Count detectors of all types are available in standard Potter units for use with these instruments.

COUNTERS AND SCALERS

- **Absolute accuracy**—at all rated speeds
- **High speeds**—to 100,000 per second
- **Decimal scale**—no complex translation
- **Visual registration**—of every count

Potter Electronic Counting and Scaling Instruments meet all requirements of high speed industrial counting, measuring and timing and are equally suitable for precision counting and scaling in radio-activity measurements and similar applications. Four models designated 320, 330, 340 and 340B afford full flexibility in satisfying the needs of most applications. Other models having additional features are available. Input actuation can be derived from all types of actions such as contact closures, shaft rotations, photoelectric equipment, electro-magnetic pickup coils, Geiger-Mueller tubes and other devices. Potter Count Detectors using photoelectric and electro-magnetic principles are available for actuations of the counters.

INTERVAL TIMERS

- **High accuracy**—greater than 0.000001 second
- **Direct reading**—no complex translation
- **Dependable**—built for continuous duty
- **Stable circuits**—no adjustments required

Designed for the exacting ballistic measurement work of the government proving grounds, these Electronic Interval Timers are now available for laboratory and industrial applications where microsecond timing is required. Their performance greatly exceeds that of other types of timers—electronic, synchronous motor or mechanical. Potter Interval Timers are entirely electronic in operation, and employ no moving parts to wear or slip.

PHOTOELECTRIC SCREENS

This screen, designed to actuate Potter Interval Timers, is widely used in measuring small arms projectile velocities. A missile passing through any part of the sensitive area generates a pulse for operation of Potter Interval Timers.

PHOTOELECTRIC COUNT DETECTORS

- **Counting rate**—to 15,000 per minute
- **Resolution**—counts object small as 0.010"
- **Sensitivity**—responds to 20% changes in light
- **Irregular shapes**—easily counted

The High Resolution Photoelectric Detectors are designed for use with standard Potter Electronic Pre-determined Counter equipment for high speed counting of miscellaneous small objects of any shape—pills, bottle caps, watch screws, buttons, hardware, etc. The Count Detector permits the application of electronic counting to many items, which because of small size, irregular shape or light weight, could not heretofore be accurately counted at high speed. Other Count Detectors for counting tin plate, cartons, bottles, etc., are also available.

WHAT'S YOUR PROBLEM?

If you have a specific application problem related to high speed timing, counting or control, or if you desire an interview with a Potter representative to discuss your problem, call or write Potter Instrument Company, Department J. No obligation will be incurred.

WRITE FOR LITERATURE

Complete information including specifications, technical data and descriptive material covering typical applications of Potter Electronic Equipment will be forwarded upon request. Please write on company letterhead and state which type of equipment you are interested in.
BRAININ ELECTRICAL CONTACTS

PRECISION SERVICE...
from Order to Delivery!

Your production problems may be simplified when you consult an organization with a long record of successfully serving electrical manufacturers in all types of precision work. Whether you are seeking advice on new applications, redesign, or wish your own designs executed, send us your requirements, and they will receive our most careful attention.

Extra KNOW-HOW for your specific design problems

THERMOSTATIC BIMETAL
PRECIOUS METAL PRODUCTS FOR ELECTRICAL MANUFACTURERS

C. S. BRAININ CO.
233 SPRING STREET, NEW YORK 13, N. Y.

for experienced cooperation "call Cleveland"

RAWSON METERS

Types:
501A
501B
501C
Accuracy % of 1%

MULTIMETERS and REGULAR METERS
AC and DC types, high accuracy, multiple ranges. 2 microamperes to 1 ampere DC. 2 milliamperes to 3 amperes AC.

ELECTROSTATIC VOLTMETERS
Ranges 150-v. to 35,000-v. AC or DC. Resistance exceeds million megohms. Can measure static electricity.

FLUXMETERS
Laboratory and production measurements on magnets and magnetic circuits. Single push button return-to-zero.

WATTMETERS
High sensitivities, low power factors. New types soon to be announced.

SPECIAL APPARATUS BUILT TO ORDER

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111-a Potter St., Cambridge, Mass.
Representatives
Chicago Los Angeles New York City

A limited quantity of reprints of this BUYERS' GUIDE is available at $2.00 per copy (Directory Section only)

REQUESTS for additional copies, sent on company letterhead and addressed to ELECTRONICS, Dept. BGR, 330 W. 42nd St., N. Y. 18, will be taken care of promptly.

June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
REK-O-KUT

"Master - Pro"

OVERHEAD MECHANISM
with a mechanical
SPIRALING DEVICE
illustrated with
Model "V" 16" Recording Turntable
Spiraling Device
Features:
1. QUIET — No gear noise or ratchet click.
2. FASTER — A spiral up to a 3/16" pitch can be cut.
3. ACTION — Velvet smoothness of action obtained by the use of newly designed over-running clutch.
4. FOOLPROOF —
   (a) One clutch is built into the leadscrew for the spiral.
   (b) The second clutch is built into the crank. This is an exclusive Rek-O-Kut safety feature which causes the crank to over-run. Should an obstruction jam the crank, or the operator accidentally attempt to turn it in the wrong direction, the recording will not be spoiled.

Standard units are equipped with 120 line outside in leadscrews. Also available in Q. I. or I. O.—90, 105, 120, at no extra cost, if requested when equipment is ordered.

Models M-5S equipped with magnetic cutter.

MODEL "V" OUTSTANDING FEATURES

Featured with the "MASTERMATIC" Semi-Automatic Speed Shift*
1. CHASSIS — Cast iron, ribbed L beam type, designed to rest on three points when mounted.
2. TURNTABLE — Lathe turned and balanced. Made of Laboratory tested aluminum alloy casting.
3. TURNTABLE SHAFT — Ground to a micro finish and lapped into the bearing for a precise fit.
4. MOTOR — Continuous duty, capacitor start and run, with rotor dynamically balanced to extra special tolerances, providing smooth, steady quiet power.
5. IDLERS — Made of a neoprene compound which will resist oil, wear and give maximum traction with minimum slippage.

AVAILABLE IN TWO MODELS
MODEL "V" DELUXE (Illustrated) equipped with Mastermatic speed shift.
MODEL "V" STANDARD

*HMastermatic* SEMI-AUTOMATIC SPEED SHIFT
This is how it works:
1. Press the control knob down.
2. Slide to the left for 78 or to the right for 33 1/3. Your turntable is now turning at its proper speed.
3. To stop turntable and shut off motor, slide control knob back to neutral.

New Cabinet Console
1. Record Holder
2. Leveling Legs
3. Cabinet Rumble
   Reduced to minimum
4. Electrical facilities
   Attached to motor panel
5. Ventilation . . . motor chamber
   Completely ventilated
6. Construction: Piano type
   For Rigidity
7. Finish — Grey metallic
8. Dimensions:
   32" high x 24" wide x 26" deep

MODEL G-2 TRANSCRIPTION TURN-TABLE
1. STARTING — Standing start to full speed at 78 rpm requires ½ of a turn—33 1/3 rpm ¼ of a turn
2. CUEING — The 15½" turntable allows the transcription, permits the operator to cue from the rim of the disc instead of the face.
3. SPEED — Maintains a constant speed that better the ½ of 1% regulation required by the N.A.B
4. NOISE LEVEL — 45 db below maximum recording level.

Sold by leading radio parts distributors and the Graybar company.

Write for Descriptive Literature on these and other Rek-o-Kut products.
speed production — cut costs with
EJECT-O-MATIC
AUTOMATIC-FEED SOLDERING IRONS AND ACCESSORIES

HEAVY DUTY EJECT-O-MATIC
High-heat 100 and 150-watt models for general heavy electrical, electronic and re-
pair work. Also available in long-nosed "instrument" model. Weight only 22 oz.

STANDARD EJECT-O-MATIC
Popular 50 and 75-watt models for general radio and electrical work. Special long-
nosed models available for soldering inside deep receptacles, hard-to-get relays and assemblies. Weight only 18 oz.

VERTI-MOUNT
Treadle operated — leaves both hands free to hold work. Pre-heats and solders work with one easy foot movement. Takes all Eject-O-
Matic irons.

complete line now available
TIPS— Multi-clad tips available in eight different sizes and shapes.
SPECIAL TIPS DESIGNED—
Send for new catalog and prices.

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AEROLITE PRODUCTS
As suppliers to the foremost radio and electronic manufacturers, we are in a position to give prompt and satisfac-
tory service on all standard and spe-
cial items required by the electronic trade.
We invite inquiries from radio, tele-
vision, transmitting, communication sys-
tems, etc., manufacturers, labora-
tories and industrial plants.
Normally we supply standard items in
a reasonably short time.
When you need something standard,
something special or something quick,
Try Aerolite First

AEROLITE ELECTRONIC HARDWARE CORP.
Manufacturers of
SHORTWAVE RADIO, TELEVISION
AND ELECTRONIC PARTS
24 Cliff St. Jersey City, N. J.

looking for a
certain electronic component with
special electrical characteristics?
you'll find it
in the advertising pages of this
BUYERS’ GUIDE
THE REFERENCE BOOK
OF THE ELECTRONIC
DESIGN ENGINEER

PROTECT
YOUR PRODUCT
at point of strain

Protect product sale-
ability too—by insur-
ing long life for cords,
cables and conductors.
Genuine "GRIPMAS-
TER" Strain Reliefs pro-
vide these vital fea-
tures—
★ Anchor cords to
housings
★ Eliminate taping or
threading
★ Prevent unraveling
★ Prevent cord pull
damage
★ All sizes and styles
★ Easy to apply
★ Inexpensive

Gripmaster Strain Reliefs are "tremendous trifles" that make
good products better!
Ask for samples.

GRIPMASTER STRAIN RELIEFS
Interruptions due to cable and
cord connection failures are elim-
inated because they anchor the
cord to the product at the point
of strain. GRIPMASTER Strain
Reliefs can withstand pulls up to
100 lbs., and are acceptable to
Underwriters Laboratories. All

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AND LITERATURE
TODAY!

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FOR SAMPLES
AND LITERATURE
TODAY!

4 WAYS TO END ALL CORD
AND CABLE SERVICE FAILURES
Economically

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HARDWARE CORP.
Manufacturers of
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PROTECT
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TODAY!

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YOUR PRODUCT
at point of strain

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housings
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threading
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damage
★ All sizes and styles
★ Easy to apply
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<thead>
<tr>
<th>CHATHAM 866-A RECTIFIER</th>
<th>CHATHAM 2D21 THYRATRON</th>
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</thead>
<tbody>
<tr>
<td>A rugged half wave Mercury Vapor rectifier to withstand high peak inverse voltages. Heavy duty filament. Fil. 2.5 volts, 5.0 amp. . . Peak inverse anode voltage 10,000 volts, 25 amp. average anode current.</td>
<td>A Xenon filled shield grid thyatron for grid controlled rectifier service. Permits use of high resistance in the grid circuit. Heater 6.3 volts, 5 amp. . . Inverse peak plate voltage 1200 volts, 100 ma. average plate current.</td>
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<tr>
<th>CHATHAM 394-A THYRATRON</th>
<th>CHATHAM 2A4G THYRATRON</th>
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<tbody>
<tr>
<td>A Mercury Vapor and Argon filled thyatron for grid controlled rectifier service . . . Amb. Temp range of -40° C to +80° C, Heater 2.5 volts, 3.2 amp. . . . Peak inverse anode voltage 1250 volts, 649 ma. average anode current.</td>
<td>An Argon filled thyatron for grid controlled rectifier service . . . Quick heating time . . . High peak currents. Fil. 2.5 volts, 2.5 amp. . . . Peak inverse plate voltage 200 volts, 100 ma. average, plate current 1.25 amp. peak plate current.</td>
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<tr>
<th>CHATHAM 5594 THYRATRON</th>
<th>CHATHAM 872-A RECTIFIER</th>
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<tr>
<td>Xenon filled thyatron. Operates through ambient temperatures from -55° C to +90° C without auxiliary equipment to maintain bulb temperature. Fil. 2.5 volts, 5.0 amperes . . . Peak inverse 5000 volts; anode current 0.5 amp. average, 2.0 amps. peak.</td>
<td>A half wave Mercury Vapor rectifier to withstand high peak inverse voltages. Heavy duty filament. Fil. 5 volts, 7.5 amp. . . . Peak inverse anode voltage 10,000 volts, 1.25 amp. average anode current.</td>
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<tr>
<th>CHATHAM 2050 THYRATRON</th>
<th>CHATHAM 1Y2 RECTIFIER</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Xenon filled shield grid thyatron for grid controlled rectifier service. Permits use of high resistance in grid current. Heater 6.3 volts, 0.6 amp. . . Peak inverse plate voltage 1300 volts, average anode current 100 MA.</td>
<td>High voltage vacuum rectifier for Television, Precipitrons, and similar applications. Low filament power and negligible dielectric loss permit efficient operation from an R. F. supply. Fil. 1.25 volts, 265 ma. Inverse Peak plate voltage 50,000 volts, 2 ma. average plate current, 18 ma. peak plate current.</td>
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<tr>
<th>CHATHAM 884 THYRATRON</th>
<th>CHATHAM 17 THYRATRON</th>
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</thead>
<tbody>
<tr>
<td>An Argon filled thyatron for use as a sweep circuit oscillator in cathode ray tube circuits. Stable oscillator. Heater 6.3 volts, 0.6 amp. . . Peak forward plate voltage 300 volts, 75 ma. average plate current.</td>
<td>A Mercury Vapor thyatron for grid controlled rectifier and general application . . . rugged filamentary cathode. Fil. 2.5 volts, 5.0 amp. . . . Peak inverse anode voltage 5,000 volts, 0.5 amp. average anode current.</td>
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<tr>
<th>CHATHAM 4B32 RECTIFIER</th>
<th>CHATHAM 3B28 RECTIFIER</th>
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<tbody>
<tr>
<td>A rugged half wave Xenon filled rectifier. Operates in any position throughout an ambient temperature range of -75° C to +90° C Fil. 5 volts, 7.5 amp. . . . Inverse peak anode voltage 10,000 volts, 1.25 amp. average anode current.</td>
<td>This rugged half wave Xenon filled rectifier will operate in any position and throughout an ambient temperature range of -75° C to +90° C. Fil. 2.5 volts, 5.0 amp. . . . Inverse peak anode voltage 10,000 volts, 25 amp. average anode current.</td>
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<tr>
<th>CHATHAM 1Z2 RECTIFIER</th>
<th>CHATHAM 12Z RECTIFIER</th>
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</thead>
<tbody>
<tr>
<td>A small bulb high voltage vacuum rectifier. Low cathode heating power and low dielectric losses make tube suitable for radio frequency supply circuits. Fil. 1.5 volts, 290 amp. . . . Inverse peak plate voltage 20,000 volts, 2 ma. average plate current, 10 ma. peak plate current.</td>
<td>A Mercury Vapor thyatron for grid controlled rectifier service . . . Quick heating time . . . High peak currents. Fil. 2.5 volts, 2.5 amp. . . . Peak inverse plate voltage 200 volts, 100 ma. average, plate current 1.25 amp. peak plate current.</td>
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The coiled resistance element is threaded on the mould core and made ready for the moulding process.

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Rectoplaters available for 6 and 12 volts, 400-1500 amperes, 230/460 volts, three-phase 60 cycle. Standard units may be seriesed or paralleled for any plating loads. (Please direct inquiries for plating equipment to the Udylite Corporation, 165 E. Grand Blvd., Detroit 11, Mich.)

All Standard Mallory Rectifiers and Chargers are available from Mallory Distributors. Write direct for data concerning special applications.

MALLORY VIBRATORS

Mallory precision vibrators bear undisputed leadership in the radio and electronic fields. Wherever high voltage is required from a low voltage DC source, Mallory vibrators assure dependable and efficient electric power conversion. Replacement types for all automobile radios.

VIBRAPACK* (Vibrator Power Supply)

The Mallory Vibrapack is a dependable source of high voltage when—and where—commercial AC power is not available. Designed to operate radio receivers, transmitters, direction finders, public address systems, and other electronic apparatus on automobiles, boats, and aircraft. Especially suited to police and military applications. Catalog E-555.


DRY ELECTROLYTIC CAPACITORS

DRY ELECTROLYTIC TYPE FP

The smallest top mounting capacitor available for rated capacity. Features identical type mounting features for all rated capacities—saves space and time in assembly. Available in ratings up to 450 volts with a wide variety of capacity combinations.

All Standard Mallory Capacitors are available from Mallory Distributors.

ALUMINUM CASED TYPE TC

Furnished in hermetically sealed aluminum tubes with insulating sleeves. Wide temperature range. Small size conserves space in assembly. Available in a wide variety of single and dual ratings up to 600 volts.

DRY ELECTROLYTIC TYPE BS

Hermetically sealed capacitors with steel exterior case. Ideal for difficult applications, including high altitudes, vibration, and extreme temperature. Available in various ratings up to 8 MFD, 600 volts.

Mallory also offers complete lines of electrostatic, mica and paper capacitors.

ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH
RS-30 AND RS-40 selector switches in high grade ceramic and phenolic insulation, respectively. Designed primarily for band and tone control circuit switching in radio receivers, they are generally suitable for low-current, high frequency circuit selection in low power electrical and electronic devices. Flexibility of design permits a wide range of circuits in multiple section assembly with high torque positive hill and valley indexing. Refer Note A (Ceramic stock types 160C and 170C); also Notes B and C.

RS-60 AND RSA-60 are switches ideal for circuit selection up to five positions. The section design is especially adapted to application where limited under-chassis space is a factor. The RS-60 employs a star wheel and ball index for medium and low torque requirements having a wide circuit range with multiple section construction. The RSA-60 employs single spring hill and valley index embodying ear support for one or two sections and is ideally suited for low torque, band and tone switch applications where low cost is a factor. Refer Notes B and C.

RL SWITCHES (1200 and 1300 series) are of high quality, rugged in construction, dependable in design, capable of low current switching, especially desirable for test instrument and industrial electronic applications. Design embraces positive high torque hill and valley index, multiple section construction with excellent range of circuit combinations. It is possible to obtain from 1 to 6 circuits per section with the number of positions depending upon the circuit requirements, utilizing a 30° index mechanism. When using a 60° index, 1 to 3 circuits are provided. Refer Notes A, B and C.

LEVER ACTION SWITCHES are particularly designed for intercommunication, centralized radio, sound distribution, public address and test equipment. Positive indexing available in two, three and four positions. Return spring action available in two and three positions. Both types have appropriate circuit combinations. Refer Notes A and B.

3100 SWITCHES are of compact, self-enclosed design, especially intended for radio frequency, tone control, antenna switching, intercommunication, test equipment and many other electronic devices where space is at a premium. Available in twelve or eighteen positions in single section construction, with a wide range of circuit combinations. Refer Notes A, B and C.
CARBON AND WIRE WOUND VARIABLE RESISTORS are available in a complete range of appropriate resistance values, tapers and sizes. Designed particularly for the radio, electronic and industrial fields, they employ substantial construction and characteristics that insure maximum satisfaction and dependable performance over long life. Refer Notes A, B and C.

VITREOUS ENAMEL RESISTORS serve industrial electronic and electrical fields as voltage dividers, dropping, load and shunt resistors in all circuits where relatively high power dissipation is required. Their rugged design and construction assure dependable operation over long life. Available in fixed and adjustable types over a wide range of ratings and sizes. Refer Notes A and B.

GRID BIAS CELLS, an exclusive patented Mallory product, are especially designed to provide dependable and constant grid bias potential in radio receivers, high gain voltage amplifiers, AVC circuits, hearing aids and many electronic applications employing Class A amplification. Individual cells and appropriate holders are available to accommodate one to four cells in series. Refer Notes A and B.

INDUCTUNER® is an exclusive patented Mallory device to provide infinitely variable inductance tuning over all frequencies assigned to Television, FM and other stations within the range of 14 to 216 megacycles. Especially designed for Television and FM receivers, it has application in high frequency generators and electronic measuring instruments. Refer Note B. (*Inductuner — Mallory registered trade mark for variable inductance tuning devices.)

VIDEOCOUPLER is an exclusive Mallory product designed to couple the video amplifier tube in television receivers. It combines three units in one assembly, including two peaking inductances and the load resistor.

Substantial in construction and design, it greatly simplifies the design of wide-band amplifiers. Refer Note B.

JACKS, JACK SWITCHES AND PLUGS are available in a wide range of sizes and circuit combinations conventional in design with rugged, long life construction. Jacks and switches are available in standard long frame, junior frame and midget sizes. Refer Note A.

NOTE A. A wide range of standard stock types is available through convenient Mallory distributors. Further particulars are contained in General Catalog 467-A, available on request.

NOTE B. Detailed Engineering Data Folder is available on request, containing complete electrical, mechanical and dimensional specifications.

NOTE C. Specification sheets are available on request, permitting the engineer to lay out circuit requirements and accurately provide complete specifications for samples or ordering. Printed on thin paper to permit blueprinting and save drafting time.
MALLORY APPROVED PRECISION PRODUCTS

MALLORY METALS & ALLOYS

Mallory takes pride in its long record of successful research in the field of non-ferrous metals and alloys.

The Mallory Company is a leading producer of special alloys and materials from copper, silver, platinum, palladium, tungsten, molybdenum, and many other non-ferrous elements for unusual applications. Mallory was a pioneer and is still the leader in developing new materials for the contact and resistance welding fields.

In the solution of many unusual problems, a world of engineering "know-how" has been gained in the applying and handling of these materials. This knowledge came to the fore during the war and led to the development of Mallory 1000 rotor rings, the welding of spark plug electrodes, and several other important military products involving special alloys and metals. It is now being used to solve many peacetime metallurgical problems that common-run materials will not handle.

While your materials problem is still in the design stage, or if you have a production problem due to an inadequate material, you are urged to take advantage of the assistance offered by Mallory engineers.

P. R. MALLORY & CO., Inc.
3029 E. Washington St., Indianapolis 6, Indiana

Special Metallurgical Products

With thirty years of experience in the metallurgical field, Mallory has developed numerous special products of non-ferrous metals and alloys that are used extensively in the electrical, electronic, and industrial fields.

- High strength, high conductivity copper base bars, strips, forgings, and castings
- Mallory 1000—high strength, high density machinability
- Special ferromagnetic iron cores
- Special de-oxidizers, purifiers and hardeners
- Tungsten and molybdenum primary shapes and fabricated parts
- Spark plug electrodes
- Glass "Bondwire" Silver bi-metal
- Rare and precious metal parts
- Special powder metal parts
- Solidloy—modern soldering tip material
- Mallosilting and precious metal plating.

Elkonite* Materials

Elkonite, through many years of proved service under severe conditions, is now the standard contact material for most heavy-duty circuit-interrupting equipment. The Elkonite process enables the compounding of metals which will not alloy in any proportion.

Elkonite materials display uniformly high physical properties; and, used in circuit-interrupting devices, they are characterized by hardness, resistance to mechanical wear and impact, good electrical conductivity, resistance to erosion by arcing, and resistance to sticking.

In cases where standard types of contacts cannot be used in electrical apparatus, the Mallory organization can be of great assistance in solving the problem. Mallory engineers, familiar with all phases of contact production, can suggest designs that will give the desired performance without excessive fabrication costs. Where the application requires the development of new materials, a competent metallurgical research staff is available for consultation.

Facilities are available for manufacturing complete contact assemblies and contacts attached to brackets, springs, studs, or arms furnished by customers.


MALLORY CONTACTS

Eight Basic Types Simplify Product Design

As the largest producer of electrical contacts in America, Mallory has created more than 5,000 contact designs in the last 25 years. From this experience, it has come to learn that the eight basic types, shown above, are the ones most commonly needed—the contacts that solve nine problems out of ten.

Mallory offers you a wide variety of these eight basic types. You can get them without delay—without the expense of specialtooling. And you can order by catalog number.

Elkonite, through many years of proved service under severe conditions, is now the standard contact material for most heavy-duty circuit-interrupting equipment. The Elkonite process enables the compounding of metals which will not alloy in any proportion.

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June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
IN THE PREPARATION of this year's ELECTRONICS BUYERS' GUIDE, every effort has been made to insure that the Directory listings are both COMPLETE and ACCURATE according to the information manufacturers provided. Each manufacturer has been required to support— with company product literature—his listings in the various product classifications.

The listings include all products, as far as the companies themselves can determine, that will be available in the coming year. The directory section therefore will prove extremely valuable as a source of buying information.

More than 3,000 companies and their complete product lines in the electronic and allied fields are arranged and indexed in a simple, easy-to-find, telephone book style. Products can be located in much the same fashion as you locate a name in the telephone book. Where the name of a manufacturer who is also an advertiser in the BUYERS' GUIDE appears in the listings, the page number of his advertisement is indicated. This will make it possible to obtain complete information on the product quickly and easily.
Alphabetical Listings Of All
COMPONENTS—COMPLETE UNITS—ALLIED PRODUCTS
Used in Electronic Equipment for All Purposes

The following listings have been compiled from information provided by more than 3,000 companies manufacturing electronic or allied products. The completeness and accuracy of the listings are entirely due to the helpful cooperation of these manufacturers.

Products for the electronic field made by these companies are arranged in a simple, alphabetical, telephone-book style of listing, in which the generic name of the product precedes the type, as: ADAPTERS—Battery.

Advertisers' names appearing in the 1947 listings are boldfaced and the page numbers of their advertisements shown, thus making it a simple matter to refer to those pages for technical data on the product.

A complete list of all manufacturers of electronic or allied products, and their addresses, is also included.

**ABRASIVES**
Carborundum Co., Globar Div., Niagara Falls, N. Y.
Do-All Co., 1301 Washington Ave., S., Minneapolis 4, Minn.
Erasco, 221 W. Water St., Syracuse 2, N. Y.
Linde Air Products Co., Unit of Union Carbide And Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
See Advertisements on Pages 34, 167.
Martindale Electric Co., Box 617, Edgewater Branch, Cleveland 3, Ohio.
Mica Products Mfg. Co., 69 Wooster St., New York, N. Y.
Minnesota Mining & Mfg. Co., 900 Faquier Ave., S. Park 6, Minn.
Norton Co., 5 New Bond St., Worcester 6, Mass.
Stow Manufacturing Co., 445 State St., Binghamton, N. Y.
U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y.

**ACCELEROMETERS**
Consolidated Engineers, Corp., 595 E. Colorado St., Pasadena 1, Calif.
Electrodyn Co., The, 899 Boylston St., Boston 1, Mass.
Molpar, Inc., 116 Fifth St. N. W., Washington 1, D.C.
Schottland, Frederick D., 104-18 Metropolitain Ave., Forest Hills, N. Y.
Statham Laboratories, 8222 Sunset Blvd., Beverly Hills, Calif.

**ADAPTERS**—Battery
Aerolite Electronic Hardware Corp., 24 Cliff St., Jersey City, N. J.
See Advertisement on Page 246.
Spotfire Tools, Inc., 2031-35 North Pulaski Road, Chicago 41, III.

**ADAPTERS**—Panoramic
Hallcrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.

Panoramic Radio Corp., 242 W. 55th St., New York 19, N. Y.

**ADAPTERS**—Short Wave for Radio
ABC Radio Labs., 3334 N. New Jersey St., Indianapolis 5, Ind.

**ADAPTERS**—Test
Aiden Products Co., 117 No. Main St., Brockton 64, Mass.
Franklin Mfg. Co., A. W., 43-20 34th St., Long Island City, N. Y.
Monitor Products Co., 815 Fremont St., So. Pasadena, Calif.
Radio Corp. of America, Tube Div., Harrison, N. J.
Rice's Sons, Inc., Bernard, 325 Fifth Ave., New York 16, N. Y.

**ADAPTERS**—COMPLETE UNITS
ABC Radio Labs., 3334 N. New Jersey St., Indianapolis 5, Ind.

**ADHESIVES**—Waterproof & Corrosion Proof Compounds
American Phenolic Corp., 1820 S. 54th Ave., Chicago 50, Ill.
American Resinous Chemical Co., 104 Foster St., Peabody, Mass.
Duralac Chemical Corp., 84 E. Washington Ave., New York 17, N. Y.
Dobry Co., John C., 168 Emmet St., Newark, N. J.
Firestone Tire & Rubber Co., 1 Firestone Ave., Falls River, Mass.
General Electric Co., S. 6th St., New York 20, N. Y.
Insulation Mfrs. Corp., 900 Fauquier Ave., S. Park 6, Minn.
Paisley Products, Inc., 1770 Canal Ave., Chicago 16, Ill.
Schoett Co., Walter L., 2086 Santa Monica Blvd., Beverly Hills, Calif.
U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y.

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American Phenolic Corp., 1820 S. 54th Ave., Chicago 50, Ill.
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General Electric Co., S. 6th St., New York 20, N. Y.
Insulation Mfrs. Corp., 900 Fauquier Ave., S. Park 6, Minn.
Paisley Products, Inc., 1770 Canal Ave., Chicago 16, Ill.
Schoett Co., Walter L., 2086 Santa Monica Blvd., Beverly Hills, Calif.
U. S. Rubber Co., 1230 Sixth Ave., New York 20, N. Y.
Triplet Electrical Instrument Co., 286 Har- 
Red Bank Road, Clifton, Ohio. 
Burlington Instrument Co., 214 North 4th 
North 17th St., New York, N. Y. 
Guided Radar Corp., 161 6th Ave., New York 
Hailcrafters Co., 4101 W. Fifth Ave, Chi- 
24, III. 
Chase Instrument Corp., 1775 Broadway, 
New York, N. Y. 
Hersch & Rademan Inc., 517 Ludow St, 
Philadelphia 2, Pa. 
Hoffman Radio Corp., 1340 S. Hill St, Los 
Angeles 5, Calif. 
House-McLendon Telephone Co., 177 Park Ave., 
Brooklyn 2, N. Y. 
Inductive Engineering Co., Gettysburg, Pa. 
Intco, 393 W. 42nd St, New York 18, 
Amalgamated Press, 190 W. 36th St, New York, N. Y. 
New York, N. Y.
AMPLIFIERS—Audio Input Systems

American Communications Corp., 206 S. Fifth St., New York 11, N. Y.
Amplifier Corp. of America, 396 Broadway, New York 13, N. Y.
Bardwell & McAllister, 7636 Broadway, New York, N. Y.
Bogen Co., 653 Broadway, New York, N. Y.
Brooklin Electronics, Inc., Eltingville, N. J.
Caltron Co., 11916 W. Pico Blvd., Los Angeles 45, Calif.
Clark Radio Equipment Corp., 4313 Lincoln Ave., Chicago, Ill.
Collins Radio Co., 156 Park St., Westfield, N. J.
Collins Radio Co., Cedar Rapids, Iowa
See Advertisement on Pages 39 to 33
Commercial Radio Sound Corp., 725 Lexington Ave., New York 22, N. Y.
Communicating Systems Co., 202 E. 18th St., New York 3, N. Y.
Eckstein Radio & Television Co., 914 La Salle Ave., Minneapolis 2, Minn.
Federal Telephone and Radio Corp., 901 W. Jackson Blvd., Chicago, Ill.
See Advertisement on Page 177
Gates Radio Co., 123 Hampton St., Quincy, Ill.
General Electric Co., Syracuse, N. Y.
See Advertisement on Pages 50 to 52
Hoffman Radio Corp., 3430 S. Hill St., Los Angeles 7, Calif.
Industrial Radio Co., Gettysburg, Pa.
Kalfell Labs., 1076 Morena Blvd., San Diego 16, Calif.
Langevin Co., Inc., 37 W. 65th St., New York 19, N. Y.
Langevin Mfg. Co., 37 W. 65th St., New York 19, N. Y.
See Advertisement on Page 153
Loge Sound Engineers, J. M., 506 S. Westergate Ave., Cincinnati 2, Ohio
Magnavox Co., The, Fort Wayne 4, Ind.
Magukin, Inc., 72 Thurmank Ave., Columbus 6, Ohio
Meadowbrook Engineering Ltd., 61 Duke St., Montreal, Quebec
See Advertisement on Page 193
National Telecommunication Systems, 1531 Devon Ave., Chicago 26, Ill.
Pan American Sound Corp., Inc., 2921 Atlantic Ave., Brooklyn 20, N. Y.
Radium Television America, RCA Victor Div., Camden, N. J.
See Advertisements on Inside Back Cover

SOS Cinema Supply Co., 449 W. 42nd St., New York 18, N. Y.
Sound Equipment Corp. of California, 3503 San Fernando Road, Glendale, Calif.
Stark Sound Engineering Co., P. O. Box Fort Wayne 1, Ind.
Stromberg Carlson, Inc., Clifton, N. J.
Task Electronics Corp., 245 W. 54th St., New York 18, N. Y.
Tech-Master Products Co., 123 Prince St., New York 7, N. Y.
Telegraphy Projects, Inc., 24 Walnut St., Newark 2, N. J.
Telictron Corp., 158 Varick St., New York 12, N. Y.
United Transformer Corp., 159 Varick St., New York 12, N. Y.
See Advertisement on Page 76
Weber Electric Co., 1500 Clark St., Racine, Wis.
Western Electric Co., Inc., 196 Broadway, New York 7, N. Y.
See Advertisement on Pages 88, 89
Western Sound & Electric Labs., Inc., 808 S. Fifth St., Milwaukee 4, Wis.

AMPLIFIERS—Decode

Amplifier Corp. of America, 396 Broadway, New York 13, N. Y.
Ballantine Labs., Inc., Bostont, N. J.
See Advertisement on Page 153
Development Engineering Co., Inc., The, 1818 Broadway, Houston 6, Texas
Freed Transformer Corp., 73 Spring St., New York 12, N. Y.
See Advertisement on Page 253
Kalofish Labs., 1076 Morena Blvd., San Diego 16, Calif.

AMPLIFIERS—Facsimile

Alden Products Co., 117 No. Main St., Brockton, Mass.
Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.
See Advertisements on Pages 49A to 49D
Radio Inventions, Inc., 155 Perry St., New York 11, N. Y.

AMPLIFIERS—Keying

Amplifier Corp. of America, 396 Broadway, New York 13, N. Y.
Boehme Inc., H. O., 915 Broadway, New York, N. Y.
Hoffman Radio Corp., 3430 S. Hill St., Los Angeles 7, Calif.
Presse Wireless Mfg. Corp., 1175 Broadway, New York 18, N. Y.
Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
Western Sound & Electric Labs., Inc., 808 S. Fifth St., Milwaukee 4, Wis.

AMPLIFIERS—Medical Instrument

American Radio Co., 611 E. Garfield Ave., Chicago 26, Ill.
American Radio Corp., 396 Broadway, New York, N. Y.
Astrometer Corp., W. 55th St., New York 1, N. Y.
Bell Sound Systems, Inc., 1183 Essex Ave., Columbus 9, Ohio
Dalmo Victor Co., San Carlos, Calif.
Development Engineering Co., Inc., The, 1818 Broadway, Houston 6, Texas
Electro-Medical Lab., Inc., Holland, Mass.
Electronic Enterprises, Inc., 1314 Forest Ave., Dallas 15, Texas
Hathaway Instrument Co., 1315 S. Clarkson St., Denver 16, Colo.
Langlevin Co., Inc., The Industrial Control Co., 41-27 W. 31st St., New York 23, N. Y.
Electronic Research Labs, Howell and Hegerman St., Phila., Pa.
Federal Radio & Ingraham Bldg., Brooklyn 22, N. Y.
Rahn Industries, Inc., 123 West Broadway, New York 7, N. Y.

AMPLIFIERS—Microwave Radar

Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.
See Advertisements on Pages 48A to 48D
General Electric Co., Syracuse, N. Y.
See Advertisements on Pages 96, 96A
Polarad Electronics Co., 135 Liberty St., New York 12, N. Y.
Radar Engineers, 4094 Arcade Bldg., Seattle 4, Wash.
Serdex, Inc., 91 Cambridge St., Boston, Mass.
Sproul Gyroscope Co., Inc., Great Neck, L. I., N. Y.
See Advertisements on Pages 80A, 80B

AMPLIFIERS—Medical Instrument

Amplifier Corp. of America, 396 Broadway, New York 13, N. Y.
Audar Inc., Argonne National Labs.
Clark Radio Equipment Corp., 4313 Lincoln Ave., Chicago 13, Ill.
Eastern Amplifier, 126 Park St., 794 E. 140th St., New York 4, N. Y.
Magnavox Co., The, Fort Wayne 4, Ind.
Meck Industries, John Liberty at Pennsylvania, Plymouth, Ind.
Quay Industries, Electronic Dept., 25 E. Jackson Blvd., Chicago 4, Ill.
Rowe Industries, 3126 Monroe St., Toledo 6, Ohio
Stark Sound Engineering Co., P. O. Box 493, Fort Wayne 1, Ind.
Stromberg-Carlson Co., Rochester, N. Y.
Gould Electronics, Inc., 158 W. 4th St., New York 14, N. Y.
Tech-Master Products Co., 123 Prince St., New York 12, N. Y.
Western Sound & Electric Labs., Inc., 808 S. Fifth St., Milwaukee 4, Wis.
Weymouth Instrument Co., 1440 Commercial St., East Weymouth, Mass.

AMPLIFIERS—Photocell

Badwell & McAllister, 7636 Santa Monica Blvd., Hollywood, Calif.
Electro-Centronics, Inc., 44 Summer Ave., Newark, N. J.
Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.
See Advertisements on Pages 48A to 48D
Gould Electronics Co., 2 Delmar Ave., Brooklyn 2, N. Y.
See Advertisements on Pages 49D, 96C
Hoffman Engineering Corp., Ansonia, Minn.
Langevin Co., Inc., The Industrial Control Div., 37 W. 55th St., New York 23, N. Y.
McGrady Specialties Co., 1008-1007 W. Washington St., Milwaukee 2, Wis.
Mouly Specialties Co., II-9-1007 W. Washington St., Milwaukee 2, Wis.
Pan American Electric Co., Inc., 2912 Atlantic Ave., Brooklyn 20, N. Y.
Tech Laboratories, 377 Central Ave., Jersey City, N. J.
Western Sound & Electric Labs., Inc., 808 S. Fifth St., Milwaukee 4, Wis.
Wills Mfg. Co., 2 N. Passaic Ave., Clatham, N. J.

AMPLIFIERS—rf

Baron Co., S. J. 143 W. 22nd St., New York 11, N. Y.
Clarke Instrument Co., 910 King St., Silver Spring, Md.
ELECTRONIC and ALLIED PRODUCTS

DeMoury-Budd Inc., 172 Grand Concourse, New York 17, N. Y.

See Advertisement on Page 71


See Advertisement on Page 71

Federal Telephone and Radio Corp., 190 W. 42nd St., New York 36, N. Y.

See Advertisement on Pages 64A to 68D

General Communication Co., The. 653 28th Common-

wealth Ave., Boston 15, Mass.


See Advertisement on Page 44


See Advertisement on Page 78

Pan American Electric Mfg. Co., 1472-74 Atlantic Ave., Brooklyn 9, N. Y.

See Advertisement on Pages 60A, 60D

Sylvania Electronic Products, Inc., 560 5th St., San Francisco 4, Cali.

See Advertisement on Pages 158 to 161

Tech-Master Products Co., 123 Prince St., New York 12, N. Y.

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 96B, 96C

Hathaway Instrument Co., 1515 S. Clarkson St., Denver 10, Colo.

Wilson & Co., G. C., 2 N. Pascale Ave., Chatham, N. J.

AMPLIFIERS — Strain Gage

Ballantine Labs., Inc., Boonton, N. J.

See Advertisement on Page 42


Consolidated Engineering Corp., 595 E.

Colorado St., Pasadena 1, Calif.


General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 60B, 60D

Hathaway Instrument Co., 1315 S. Clarkson St.

Baltimore, Md.

Helios Research Labs., Chicago 10, Ill.

Electronic Sound Engineering Co., Raytheon Mfg. Co., Commercial Products


Dude Engineering Co., 315 S. Clarkson St., Denver, Colo.

Other Electronics, Inc., 5320 N. Kedzie Ave., Chicago 33, Ill.

Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80D

Television Products Inc., 7444 West Irving Park Rd., Chicago 34, Ill.

Wilson & Co., G. C., 2 N. Pascale Ave., Chatham, N. J.

AMPLIFIERS — Video

See Amplifiers, Television or Wideband

American Radio Co., 611 E. Garfield Ave., Glendale, Calif.

Ballantine Labs., Inc., Boonton, N. J.

See Advertisement on Page 42


Consolidated Engineering Corp., 595 E.

Colorado St., Pasadena 1, Calif.


General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 96B, 96C

Hathaway Instrument Co., 1515 S. Clarkson St., Denver 10, Colo.

Wilson & Co., G. C., 2 N. Pascale Ave., Chatham, N. J.

AMPLIFIERS—Vibration Pickup


Consolidated Engineering Corp., 595 E.

Colorado St., Pasadena 1, Calif.

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 96B, 96C


Hathaway Instrument Co., 1315 S. Clarkson St.

Dixie Electric, Inc., 20 East Broadway, New York 6, N. Y.

Rahm Instruments, Inc., 12 West Broadway, New York 7, N. Y.

Rahm Instruments, Inc., 12 West Broadway, New York 7, N. Y.

Wilson & Co., G. C., 2 N. Pascale Ave., Chatham, N. J.

ANALYZERS — Gas

Applied Physics Corp., 40 South Oak Knoll Ave., Columbia, N. J.

Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 7, Ohio

Consolidated Engineering Corp., 595 E.

Colorado St., Pasadena, Calif.


Freed Transformer Co., 72 Spring St., New York 13, N. Y.

See Advertisement on Page 323

Foster-Walker Co., 899 Boylston St., Boston 15, Mass.

General Electric Co., Schenectady 5, N. Y.

See Advertisement on Page 193

Heine, Inc., 915 Riverdale Dr., Indianapolis 5, Ind.


Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 88, 89

ANALYZERS — Circuit

Amerline, 1753 N. Honore St., Chicago 22, Ill.

Cinema Engineering Co., 1508 W. Verdego Dr., Burbank, Calif.

Development Engineering Co., Inc., The, 1811 Ashland St., Houston 8, Texas

Evelco, Inc., 1440 N. 22d St., Philadelphia 33, Pa.

Foster-Walker Co., 899 Boylston St., Boston 15, Mass.

General Electric Co., Syracuse, N. Y.

J-B-T Instruments, Inc., 441 Chapel St., New Haven 8, Conn.

Madison Electronic Products Div. of John O.

Ruckelshaus Co., 74 Main St., Madison, N. J.

Maguire Industries Inc., Electrons, Bridgeport, Conn.

Measurement Engineering Co., 61 Duke St.,

Toronto, Canada

See Advertisement on Page 193

ANALYZERS — Harmonic

Electro Products Labs., 549 W. Randolph St., Chicago 6, Ill.

ANALYZERS — Gas

Applied Physics Corp., 40 South Oak Knoll Ave., Columbia, N. J.

Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 7, Ohio

Consolidated Engineering Corp., 595 E.

Colorado St., Pasadena, Calif.


Freed Transformer Co., 72 Spring St., New York 13, N. Y.

See Advertisement on Page 323

Foster-Walker Co., 899 Boylston St., Boston 15, Mass.

General Electric Co., Schenectady 5, N. Y.

See Advertisement on Pages 96B, 96C


ANALYZERS — Ultrasonic

AMPLIFIERS — Strain Gage
Electronic Measurements Co., Red Bank, N. J. See Advertisement on Page 68
Freed Transistor Co., 72 Spring St., New York 13, N. Y. See Advertisement on Page 253
Waterman Products Co., Inc., 2445-63 Em- erald St., Philadelphia 36, Pa. See Advertisement on Page 76
Western Electric Co., Inc., 195 Broadway, New York 7, N. Y. See Advertisements on Pages 88, 89

ANALYZERS—Vibration
Commercial Research Labs., Inc., 20 Bart- ley St., Denver 3, Mich. See Advertisement on Pages 96B, 96C
General Electric Co., Schenectady 5, N. Y. See Advertisements on Pages 96B, 96C
Hathaway Instrument Co., 1315 S. Clarkson St., Denver 16, Colo. See Advertisement on Page 248
Saxl Instrument Co., 6 Linnaean St., Cam- bridge 38, Mass. See Advertisement on Page 76

ANALYZERS—Wave
Barker & Williamson, 235 Fairfield Ave., Upper Darby, Pa. See Advertisement on Page 68
Electronic Measurements Co., Red Bank, N. J. See Advertisement on Page 68
Western Electric Co., Inc., 195 Broadway, New York 7, N. Y. See Advertisements on Pages 88, 89

ANALYZERS—Microwave Radar
Western Electric Co., Inc., 195 Broadway, New York 7, N. Y. See Advertisements on Pages 88, 89

ANALYZERS—Noise
Western Electric Co., Inc., 195 Broadway, New York 7, N. Y. See Advertisements on Pages 88, 89

ANALYZERS—Spectrum
Panoramic Radio Corp., 248 W. 55th St., New York 19, N. Y. See Advertisement on Page 44

ANODES
See Tube Parts

ANTENNA DRAG UNITS
Searle Aero Industries, Inc., Orange, Calif. See Advertisement on Page 193

ANTENNA FEED SYSTEMS
Andrew Co., 383 E. 77th St., Chicago 19, Ill. Federal Telecommunications Corp., 190 Kingston Rd., Clifton, N. J. See Advertisement on Page 192
Rice’s Song Inc., Bernard, 325 Fifth Avenue, New York 1, N. Y. See Advertisement on Page 192

ANTENNA KITS
Columbia Wire & Supply Co., 5734 N. Elson Rd., Cleveland 40, Ohio See Advertisement on Page 215
Crothers & Devices & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill. Cornish Wire Co., 15 Park Row, New York 6, N. Y. See Advertisement on Page 215
General Electric Co., Syracuse, N. Y. See Advertisement on Page 215
Heath Co., Benton Harbor, Mich. See Advertisement on Page 248
Insignia Corp. of America, 2602-35th Ave., Long Island City, N. Y. See Advertisement on Page 215

ANTENNA MECHANICAL DRIVES
Wind Turbine Co., Inc., 1523 E. 48th St., Cleveland 3, Ohio See Advertisement on Page 248
Workshop Associates, 66 Needham Street, Newton Highlands 61, Mass.
Breeze Corp., 41 S. 6th St., Newark, N. J.
Dalmco Victor Co., San Carlos, Calif.
Diamond Co., 16-30 Arbor St., Hartford, Conn.
Eagle Electronics, Inc., Bernard, 35 Fifth Ave., New York 16, N. Y.
Era Instruments Co., Great Neck, L. I., N. Y.
See Advertisements on Pages 80A, 80B

Bendix Radio Div., Bendix Aviation Corp., Baltimore, Md.
Bird Electronic Corp., 1800 E. 38th St., Cleveland.
Clarke Instrument Corp., Syracuse, N. Y.
Crown Inf. Div., 200 East 43rd St., New York 17, N. Y.
Federal Telephone and Radio Corp. 100
Kingsland Rd., Clifton, N. J.
See Advertisements on Pages 48 to 48D
General Electric Co., Syracuse, N. Y.
General Electric Co., 85 East 48th St., New York 17, N. Y.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Radio Corp. of America, RCA Victor Div.
Carnegie, N. Y.
See Advertisements on Inside Back Cover & Back Cover, 251
Sears Aero Corp., Grover Orange, Calif.
Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.
See Advertisements on Pages 80A, 80B
Workshop Associates, 66 Needham Street, Newton Highlands 61, Mass.

ANTENNAS—All Wave Receiving
Alpha Wire Co., 59 Howard St., New York 14, N. Y.
American Photoelectric Corp., 1838 S. 54th Ave., Chicago 22, Ill.
American Photoelectric Corp., 115 East 43rd St., New York 17, N. Y.
Amy, Aces & King Inc., 2511 W. 22nd St., Columbus, Ohio
Bendix Radio Div., Bendix Aviation Corp., Balitmore, Md.
Brock Mfg. Co., 55 Dickerson St., New York 11, N. Y.
Burgess Rogers Co., 657 Boylston St., Boston 16, Mass.
Columbia Radio Supply Co., 5754 N. Elston Ave., Chicago 30, Ill.
Commercial Radios Sound Corp., 375 Lexington Ave., New York 7, N. Y.
Consolidated Wire & Associated Companies, 1635 S. Clark St., Chicago 14, Ill.
Dielectric Products Co., Inc., 153 Virginia Ave., Jersey City 4, N. J.
Fishwick Radio Co., Inc., Colorado Bldg., Washington, D. C.
Flew & Son Inc., 113 N. Broad St., Trenton 8, N. J.
Insuline Corp. of America, 26-22 32nd Ave., L. I. City, N. Y.
See Advertisement on Page 166
Inter Mfg. Co., 325 Sussex Ave., Newark 4, N. J.
See Advertisements on Pages 180, 215
Magnavox Co. The, Fort Wayne 4, Ind.
Magrity Industries Inc., Electromechnic Dept., Bridgeport, Conn.
Miltonocean Co., 748 W. Virginia St., Milwaukee 4, Wis.
Pan American Electric Co., 2912 Atlantic Ave., Brooklyn 7, N. Y.
Polytron Corp., 491 Broadway, New York 3, N. Y.
Radio Corp. of America, Tube Div., Hartford, Conn.
Stannet, Winding Co., 102 S. Landier St., Newburgh.
Super Electric Products Corp., 1057 Summit Ave., Jersey City, N. J.
Technical Appliance Corp., 41-06 DeLong St., Flushing, N. Y.

ANTENNAM—Broadcast Station Radiators
American Photoelectric Corp., 1838 S. 54th Ave., Chicago 22, Ill.
See Advertisement on Page 23
Federal Telephone and Radio Corp. 100
Kingsland Rd., Clifton, N. J.
See Advertisements on Pages 48 to 48D
General Electric Co., Syracuse, N. Y.
General Electric Co., 85 East 48th St., New York 17, N. Y.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Radio Corp. of America, RCA Victor Div.
Carnegie, N. Y.
See Advertisements on Inside Back Cover & Back Cover, 251
Sears Aero Corp., Grover Orange, Calif.
Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.
See Advertisements on Pages 80A, 80B
Industrial-Building Products, 66 Needham Street, Newton Highlands 61, Mass.
Insuline Corp. of America, 26-22 32nd Ave., L. I. City, N. Y.
See Advertisement on Page 166
Inter Mfg. Co., 325 Sussex Ave., Newark 4, N. J.
See Advertisements on Pages 180, 215
Magnavox Co. The, Fort Wayne 4, Ind.
Magrity Industries Inc., Electromechnic Dept., Bridgeport, Conn.
Miltonocean Co., 748 W. Virginia St., Milwaukee 4, Wis.
Pan American Electric Co., 2912 Atlantic Ave., Brooklyn 7, N. Y.
Polytron Corp., 491 Broadway, New York 3, N. Y.
Radio Corp. of America, Tube Div., Hartford, Conn.
Stannet, Winding Co., 102 S. Landier St., Newburgh.
Super Electric Products Corp., 1057 Summit Ave., Jersey City, N. J.
Technical Appliance Corp., 41-06 DeLong St., Flushing, N. Y.

ANTENNAS—Dipole
American Photoelectric Corp., 1838 S. 54th Ave., Chicago 22, Ill.
American Photoelectric Corp., 115 East 43rd St., New York 17, N. Y.
Amy, Aces & King Inc., 11 W. 22nd St., New York 11, N. Y.
Andrew Co., 183 E. 72nd St., Chicago 19, Ill.
Baritone Co., S. A., 143 W. 22nd St., New York 11, N. Y.
Collins Radio Co., Cedar Rapids, Iowa
See Advertisements on Pages 30 to 33
Eron Radio Corp., 200 East 42nd St., New York 17, N. Y.
Hempstead, N. Y.
See Advertisement on Page 35
American Photoelectric Corp., 1838 S. 54th Ave., Chicago 22, Ill.
American Photoelectric Corp., 115 East 43rd St., New York 17, N. Y.
American Bridge Co., Hick Bldg., Pitts-
Federal Telephone and Radio Corp., 100 E. 42nd St., New York, N. Y.

N. J.

Collins Radio Co., 104-17 63rd Rd., Flushing, N. Y.

Collins Radio Co., 104-17 63rd Rd., Flushing, N. Y.

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Collins Radio Co., 104-17 63rd Rd., Flushing, N. Y.

Collins Radio Co., 104-17 63rd Rd., Flushing, N. Y.
Westinghouse Electric Corp., Motor Div., Buffalo, N. Y.

**BRUSHES—Metal-Graphite**

Becker Bros. Carbon Corp., 2450 S. 52nd Ave., Chicago, III.
Graphite Metallizing Corp., 1041 Neperhan Ave., Yonkers, N. Y.
Johnson Co., E. F., Waseca, Minn.

**BRUSH BAR SYSTEMS**

Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.

**BUS BAR SYSTEMS**

Alcraft-Marine Prods., Inc., 1523 No. 4th St., Harrisburg, Pa.
Chase Boiler & Casing Co., Inc., Waterbury 91, Conn.

**BUSHINGS—Hermetically Sealed**

Centralab, Div. of Globe Union Inc., 900 Reede Ave., Milwaukee 1, Wis.

**BUSHINGS—Nonmetallic**

Acroline Electronic Hardware Corp., 24 Cliff St., Jersey City, N. J.
American Lava Corp., Chattanooga 5, Tenn.

**BUS BARS—Solderless**

Aluminum Tube & Supply Corp., 1539 30th St., Brooklyn, N. Y.

**CABINET—Metal**


**CABINETS**

General Electric Co., 1201 Flushing Ave., Brooklyn 3, N. Y.
Beckman Instruments Inc., 460 Broome St., New York 13, N. Y.

**CABINETS—Metal**

Art-Lloyd Metal Products Corp., 2974 Croydon Ave., Brooklyn 15, N. Y.
Baker Instrument Co., 310 Main St., Orange, N. J.

**CABINETS—Plastic**

Barre-Ware, Inc., 800 5th Ave., New York 17, N. Y.

**CABINETS—Wood**

Black & Decker Mfg. Co., 2995 Quaker Ave., Brooklyn 30, N. Y.

**BUSINESS MACHINES**

Bunker Hutton, Inc., 765 E. 80th St., New York 28, N. Y.

**BUSINESS MACHINES—Microfilm**

Bunton Machine Co., Inc., 1201 Flushing Ave., Brooklyn 3, N. Y.

**BUSINESS MACHINES—Telegraph**

Perry Bros., Inc., 709 7th Ave., Seattle 5, Wash.

**BUSINESS MACHINES—Telegraph**

Sewall, Inc., 497 Lafayette St., New York 13, N. Y.

**BUSINESS MACHINES—Teletype**

Sewall, Inc., 497 Lafayette St., New York 13, N. Y.

**BUSINESS MACHINES—Teletype**

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**BUSINESS MACHINES—Teletype**

Sewall, Inc., 497 Lafayette St., New York 13, N. Y.

**BUSINESS MACHINES—Teletype**

Sewall, Inc., 497 Lafayette St., New York 13, N. Y.
ELECTRONIC and ALLIED PRODUCTS

CAPACITORS

American Phenolic Corp., 1830 S. 54th Ave., Chicago 30, Ill.
American Baking Co., 4674 W. Van Buren St., Chicago 18, Ill.
American Insulated Wire Corp., U. S. Rubber Co., 12 3rd St., Jersey City 5, N. J.
Ameriwire & Steel, 104 111th St., Tarrytown, N. Y.
Belden Mfg. Co., 4647 W. Van Buren St., Chicago 18, Ill.
Birnback Radio Co., Inc., 145 Hudson St., Newark, N. J.
Boston Insulated Wire & Cable Co., 61 Bay State Rd., Jamaica 1, N. Y.
Collins Radio Co., Cedar Rapids, Iowa.
See Advertisements on Page 20.
Consistent Wire & Associated Companies, 1635 S. Clinton St., Chicago 16, Ill.
Cornish Wire Co., 1087 11th St., Los Angeles, Calif.
Columbia Insulating, 135 Virginia Ave., Jersey City 2, N. J.
Cable - Shielded
American Phenolic Corp., 1830 S. 54th Ave., Chicago 30, Ill.
American Baking Co., 4674 W. Van Buren St., Chicago 18, Ill.

cable - uhf
American Phenolic Corp., 1830 S. 54th Ave., Chicago 30, Ill.
American Baking Co., 4674 W. Van Buren St., Chicago 18, Ill.

cable - uhf
American Phenolic Corp., 1830 S. 54th Ave., Chicago 30, Ill.
American Baking Co., 4674 W. Van Buren St., Chicago 18, Ill.

CALIBRATORS - Sweep
Clarkston Corp., 11927 W. Pico Blvd., Los Angeles 34, Calif.
General Electric Co., 250 East 42nd St., New York 17, N. Y.
Olmeter Electric Co., 195 Broadway, New York 7, N. Y.
Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

CALIBRATORS - uhf
Alpha Wire Corp., 50 Howard St., New York, N. Y.
Ferris Instrument Co., 110-112 Cornelia St., Brooklyn 21, N. Y.
Rollin Co., 1070 N. Fair Oaks Ave., Pasadena 3, Calif.
Supreme Electrical Insulation Co., 84 Purchase St., Boston 10, Mass.

CAMERAS - Cathode Ray Oscillograph
Electrodyne Co., The, 889 Boylston St., Boston 15, Mass.
Fairchild Camera & Instrument Corp., Schenectady 5, N. Y.
Farnsworth Television & Radio Corp., Ft. Wayne, Ind.
General Electric Co., Syracuse, N. Y.

CAMERAS - Television
Farnsworth Television & Radio Corp., Ft. Wayne, Ind.
General Electric Co., Syracuse, N. Y.

CAMERAS - X-Ray
Fairchild Camera & Instrument Corp., 38-06 Van Wyck Blvd., Jamaica 1, N. Y.

CANS
Miller Co., J. W., 5137 S. Main St., Los Angeles, Calif.
Radial Service, 720 W. Schubert Ave., Chicago 14, Ill.

CANS - Hermetically Sealed
Cincinnati Electric Products Co., Carthage at Hannford, Cincinnati 12, Ohio.
Cook Electric Co., 2700 Southport Ave., Chicago, Ill.
Hermeti-Seal Products Co., 414 Morris Ave., Newark 3, N. J.
Industrial Condenser Corp., 3243 N. Calif. Ave., Chicago 18, Ill.
Radial Service, 720 W. Schubert Ave., Chicago 14, Ill.

CAPACITORS - Ceramic-Fixed

ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH
### 1947-1948 DIRECTORY of Capacitors

**CAPACITORS—Electrolytic**

<table>
<thead>
<tr>
<th>Company</th>
<th>Address</th>
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</thead>
<tbody>
<tr>
<td>Advance Electronics Mfg. Co.</td>
<td>657 Schuyler Ave., Newark, N. J.</td>
</tr>
<tr>
<td>Aerovox Corp.</td>
<td>58 West 42nd St., New York, N. Y.</td>
</tr>
<tr>
<td>Panamatic Corp.</td>
<td>34 Hubert St., New York, N. Y.</td>
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<tr>
<td>General Electric Co.</td>
<td>400 Keefe Ave., Milwaukee, Wis.</td>
</tr>
<tr>
<td>Aircraft Radio Corp.</td>
<td>2118 5th St., Cleveland, O. R.</td>
</tr>
<tr>
<td>Consolidated Wire &amp; Cable Corp.</td>
<td>3757 W. North Ave., Chicago, Ill.</td>
</tr>
<tr>
<td>Mallory &amp; Co., Inc.</td>
<td>1000 Hamilton Blvd., South Plainfield, Ill.</td>
</tr>
<tr>
<td>Magnavox Co., The</td>
<td>Fort Wayne 4, Ind.</td>
</tr>
<tr>
<td>Intex Corp.</td>
<td>900 Keefe Ave., Milwaukee, Wis.</td>
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<td>Magnuson Corp.</td>
<td>251 S. Sangamo Electric Co., Springfield, Ill.</td>
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**CAPACITORS—Gas-filled**

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<th>Company</th>
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<tr>
<td>Johnson &amp; E. F. Wason, Inc.</td>
<td>116 V. L. LeRoy, N. Y.</td>
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<tr>
<td>Lampa Insulator Corp.</td>
<td>3243 No. California Ave., Chicago, Ill.</td>
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<tr>
<td>Illinois Condenser Corp.</td>
<td>3243 No. California Ave., Chicago, Ill.</td>
</tr>
<tr>
<td>Delco Remy Inc.</td>
<td>1000 Hamilton Blvd., South Plainfield, Ill.</td>
</tr>
<tr>
<td>General Electric Co.</td>
<td>400 Keefe Ave., Milwaukee, Wis.</td>
</tr>
<tr>
<td>Aircraft Radio Corp.</td>
<td>2118 5th St., Cleveland, O. R.</td>
</tr>
<tr>
<td>Consolidated Wire &amp; Cable Corp.</td>
<td>3757 W. North Ave., Chicago, Ill.</td>
</tr>
<tr>
<td>Mallory &amp; Co., Inc.</td>
<td>1000 Hamilton Blvd., South Plainfield, Ill.</td>
</tr>
<tr>
<td>Magnavox Co., The</td>
<td>Fort Wayne 4, Ind.</td>
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<tr>
<td>Intex Corp.</td>
<td>900 Keefe Ave., Milwaukee, Wis.</td>
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**CAPACITORS—Mica Fixed**

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<th>Company</th>
<th>Address</th>
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<tr>
<td>Aerovox Corp.</td>
<td>740 Belleville Ave., New Bedford, Mass.</td>
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<tr>
<td>Brown Engineering Co.</td>
<td>4635 E. 55th St., Cleve., Ohio</td>
</tr>
<tr>
<td>General Electric Co.</td>
<td>400 Keefe Ave., Milwaukee, Wis.</td>
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<tr>
<td>Illinois Condenser Corp.</td>
<td>3243 No. California Ave., Chicago, Ill.</td>
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<tr>
<td>Delco Remy Inc.</td>
<td>1000 Hamilton Blvd., South Plainfield, Ill.</td>
</tr>
<tr>
<td>Mallory &amp; Co., Inc.</td>
<td>1000 Hamilton Blvd., South Plainfield, Ill.</td>
</tr>
<tr>
<td>Magnavox Co., The</td>
<td>Fort Wayne 4, Ind.</td>
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<tr>
<td>Intex Corp.</td>
<td>900 Keefe Ave., Milwaukee, Wis.</td>
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**CAPACITORS—Mica Transmitting**

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<th>Company</th>
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<tr>
<td>Aerovox Corp.</td>
<td>740 Belleville Ave., New Bedford, Mass.</td>
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<tr>
<td>General Electric Co.</td>
<td>400 Keefe Ave., Milwaukee, Wis.</td>
</tr>
<tr>
<td>Illinois Condenser Corp.</td>
<td>3243 No. California Ave., Chicago, Ill.</td>
</tr>
<tr>
<td>Delco Remy Inc.</td>
<td>1000 Hamilton Blvd., South Plainfield, Ill.</td>
</tr>
<tr>
<td>Mallory &amp; Co., Inc.</td>
<td>1000 Hamilton Blvd., South Plainfield, Ill.</td>
</tr>
<tr>
<td>Magnavox Co., The</td>
<td>Fort Wayne 4, Ind.</td>
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<tr>
<td>Intex Corp.</td>
<td>900 Keefe Ave., Milwaukee, Wis.</td>
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**CAPACITORS—Mica Trimmer**

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<th>Company</th>
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<tr>
<td>Automatic Mfg. Co.</td>
<td>900 Passaic Ave., Newark, N. J.</td>
</tr>
<tr>
<td>General Electric Co.</td>
<td>400 Keefe Ave., Milwaukee, Wis.</td>
</tr>
<tr>
<td>Illinois Condenser Corp.</td>
<td>3243 No. California Ave., Chicago, Ill.</td>
</tr>
<tr>
<td>Delco Remy Inc.</td>
<td>1000 Hamilton Blvd., South Plainfield, Ill.</td>
</tr>
<tr>
<td>Mallory &amp; Co., Inc.</td>
<td>1000 Hamilton Blvd., South Plainfield, Ill.</td>
</tr>
<tr>
<td>Magnavox Co., The</td>
<td>Fort Wayne 4, Ind.</td>
</tr>
<tr>
<td>Intex Corp.</td>
<td>900 Keefe Ave., Milwaukee, Wis.</td>
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**CAPACITORS—Oil impregnated**

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<th>Company</th>
<th>Address</th>
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<tbody>
<tr>
<td>Advance Electronics Mfg. Co.</td>
<td>657 Schuyler Ave., Newark, N. J.</td>
</tr>
<tr>
<td>Aerovox Corp.</td>
<td>58 West 42nd St., New York, N. Y.</td>
</tr>
<tr>
<td>Mallory &amp; Co., Inc.</td>
<td>1000 Hamilton Blvd., South Plainfield, Ill.</td>
</tr>
<tr>
<td>Magnavox Co., The</td>
<td>Fort Wayne 4, Ind.</td>
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<tr>
<td>Intex Corp.</td>
<td>900 Keefe Ave., Milwaukee, Wis.</td>
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**CAPACITORS—Neutralising**

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<tr>
<th>Company</th>
<th>Address</th>
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<tr>
<td>Electric Auto-Lite Co.</td>
<td>900 Keefe Ave., Milwaukee, Wis.</td>
</tr>
<tr>
<td>Aerovox Corp.</td>
<td>58 West 42nd St., New York, N. Y.</td>
</tr>
<tr>
<td>Mallory &amp; Co., Inc.</td>
<td>1000 Hamilton Blvd., South Plainfield, Ill.</td>
</tr>
<tr>
<td>Magnavox Co., The</td>
<td>Fort Wayne 4, Ind.</td>
</tr>
<tr>
<td>Intex Corp.</td>
<td>900 Keefe Ave., Milwaukee, Wis.</td>
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**CAPACITORS—Padder**

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<th>Company</th>
<th>Address</th>
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<tbody>
<tr>
<td>Centralab, Div. of Globe Union Inc.</td>
<td>900 Keefe Ave., Milwaukee, Wis.</td>
</tr>
<tr>
<td>Aerovox Corp.</td>
<td>58 West 42nd St., New York, N. Y.</td>
</tr>
<tr>
<td>Mallory &amp; Co., Inc.</td>
<td>1000 Hamilton Blvd., South Plainfield, Ill.</td>
</tr>
<tr>
<td>Magnavox Co., The</td>
<td>Fort Wayne 4, Ind.</td>
</tr>
<tr>
<td>Intex Corp.</td>
<td>900 Keefe Ave., Milwaukee, Wis.</td>
</tr>
</tbody>
</table>
ELECTRONIC and ALLIED PRODUCTS


CAPACITORS—Paper

CAPACITORS—Plastic Dielectric

CAPACITORS—Precision Air

CAPACITORS—Silvered Mica

CAPACITORS—Trimmer Receiving

Teleradio Engineering Corp., 99 Wall St., New York 5, N. Y.

CAPACITORS—Vacuum

CAPACITORS—Variable Receiver Tuning
1947-1948 DIRECTORY of

CAPACITORS

Millen Mfg. Co., James, 150 Exchange St.,
Malden, Mass., on Page 155
See Advertisement on Page 44
Molded Insulation Co., Aircraft Control Div.,
National Co., Inc., 61 Sherman St., Malden
See Advertisement on Page 78
Radiotron, 328 W. 50th St., Chicago, Ill.
Baker & Williamson, 233 Fairfield Ave.,
Upper Darby, Pa.
Bud Radio, Inc., 2118 E. 55th St., Cleveland
Ohio
Cardwell Mfg. Corp., Allen D., 97 Whiting
Rd., No. Chicago, Ill.
Clarkstar Corp., 1127 W. Pico Blvd., Los
Angeles 5, Calif.
Federal Telephone and Radio Corp., 100
Mainland Rd., Clifton, N. J.
See Advertisements on Pages 18A to 48D
Hannam & Co., Inc., 560 W. 34th St.,
New York, N. Y.
Johnson Co., E. F. Waseca, Minn.
Kitts, 372 Classon Ave., Brooklyn 5, N. Y.
Moko Co., Inc., 1249 Main St., Hartford
3, Conn.
Michigan Radio Corp., 1087 Foshay Ave.,
Minneapolis 7, Minn.
Millen Mfg. Co., James, 150 Exchange St.,
Malden, Mass.
See Advertisement on Page 78
Peerless Labs, 411-47th Ave., New York 18,
N. Y.
CAPACITORS—Variable Transmitter Tuning
Airplane & Marine Instruments, Inc., Clear-
Andrew Co., 262 E. 75th St., Chicago 19, Ill.
Barker & Williamson, 233 Fairfield Ave.,
Upper Darby, Pa.
Radio Condensor Co., Camden, N. J.
Scarce Aeolian, Inc., Orange, Calif.
Waterproof Electric Co., 72 E. Verduro
Ave., Burbank, Calif.
CAPACITORS—Portable
Airplane Radio Corp., Boonton, N. J.
See Advertisement on Page 155
Airplane & Marine Instruments, Inc., Clear-
Andrew Co., 262 E. 75th St., Chicago 19, Ill.
Barker & Williamson, 233 Fairfield Ave.,
Upper Darby, Pa.
Radio Condensor Co., Camden, N. J.
Scarce Aeolian, Inc., Orange, Calif.
Waterproof Electric Co., 72 E. Verduro
Ave., Burbank, Calif.

CASES, PORTABLE
(for Radios, Phonographs, Amplifiers, etc.)
Atlantic Sound Corp., 1443 39th St., Brooklyn,
See Advertisement on Page 96D
Audar Inc., Arabs, Ind.
Boonton Molding Co., Boonton, N. J.
Eastern Case Co., 51 Bond St., New York
11, N. Y.
Garrard Sales Co., 501 Broadway, Fort
Ways, Ind.
Hollywood Radio Cabinet Co., 924 N. For-
Lawrenceville, Ill.
Insuline Corp., of America, 205 East 44th
St., New York 17, N. Y.
Karp Metal Products Co., 1937 E. 103rd
S.D., Chicago 35, Ill.
Minute Man Products, Inc., 5010 River Ave.,
New York 17, N. Y.
Radiant Service, 720 W. Schubert Ave., Chi-

CENTMOS—Radio
Ambrroid Co., 305 Franklin St., Boston 10,
Mass.
American Phonollic Corp., 1830 S. 54th Ave.,
Chicago 10, Ill.
See Advertisement on Page 23
American Products Mfg. Co., Qlsander &
Dublin Mfg. Co., 1515 W. 18th St., Los
Angeles 4, Calif.
American Resinol Chemical Co., 104 Foster
St., Painesville, Mass.
Aroco, 7906 Bessener Ave., Cleveland 4,
Bakelite Corp., 500 Madison Ave., New York
17, N. Y.
Duryea Mfg. Co., 5010 Summerdale Ave.,
Phila 24, Pa.
General Comer Mfg. Co., 919 Taylor Ave.,
New York 17, N. Y.
See Advertisement on Page 96
General Electric Co., Syracuse, N. Y.
See Advertisements on Pages 96, 96A
Habbs Labs., Inc., C. W., 61 Chandler St.,
Springfields, Mass.
Insuline Corp., Inc., 875 Meeker Ave.,
Brooklyn 43, N. Y.
Insuline Co., 1 Broadway, New York, N. Y.
17, N. Y.
Mans & Wallah, 438 River Ave.,
Newark 4, N. J.
See Advertisement on Page 96
Palisades Products Co., 1770 Canaport Ave.,
Palis, Corp., 5010 South Averell St., Harbor
6, Conn.
Sanden Insulation Co., 3100 W. 12th St.,
Milwaukee, Wis.
Seabury Corp., 44 2nd Ave., Brooklyn 1, N. Y.
Superior Insulating Co., 44 2nd Ave.,
Brooklyn 1, N. Y.

CERAMIC
See Insulation Materials

CESIUM COMPOUNDS
See Metals

CHANGERS—Automatic Record
Admiral Corp., 3800 Cortland St., Chicago
Avalon Radio Corp., Phoenix, Arizona
Banyon, C. 1., 1906, 683 Broadway, New York
12, N. Y.
Chicago Industries, Inc., 4140 Belmont Ave.,
Chicago 11, Ill.
Corning Radio Corp., 522 W. Erie St., Chicago,
Ill.
Farmworth Precision Radio Corp., Fort
Ways, Ind.
Garrard Sales Co., 491 Broadway, New York
13, N. Y.

General Instrument Corp., 829 Newark Ave.,
Elizabeth, N. J.
See Advertisement on Page 71
Lear, Inc., 110 Ionia Ave., N.W., Grand
Rapids 2, Ml.
Magnavox Co., The, Fort Wayne 4, Ind.
McMurdo Silver Co., 1249 E. 103rd St., Chi-

CHASSIS—Metal
Alamagaramed Radio Television Corp., 476
New York 19, N. Y.
Art-Lloyd Metal Products Co., 8273 Corey
Ave., Brooklyn 14, N. Y.
Bud Radio, Inc., 2118 E. 55th St., Cleveland
Ohio
Camden Mfg. Co., 600 E. 143rd St., New
York, N. Y.
Rahlstrom Metallic Door Co., Jamestown, N. Y.
Eclipse Mfg. Co., Inc., 294 E. 137th St., New
York 44, N. Y.
Edin Electronics Co., 207 Main St., Wor-
cester, Mass.
Electrodyne Co., 207 Main St., Wor-
cester, Mass.
Ferranti Electronic, Inc., 29 Rockefeller Plaza,
New York, N. Y.
General Instrument Corp., 139 39th Ave.,
Brooklyn, N. Y.
Gardner Mfg. Co., M. C. 171 Union Blvd., Oak-
land, Calif.
Garrett Corp., Inc., 1451 Chestnut St., Phi-
adelphia 2, Pa.
Hathaway Instrument Co., 1218 S. Clarkson St.,
Denver 10, Colo.
Insuline Corp. of America, 36-58 35th Ave.,
Long Island City, N. Y.
Karp Metal Products Co., Inc., 139 39th Ave.,
Brooklyn, N. Y.
La Magra Mfg. Co., Inc., East Rutherford,
N. J.
Lorentzen, H. K., 191 W. Broadway,
New York 7, N. Y.
Meadco Silver Co., 1249 Main St., Hart-
ford 3, Conn.
Measurement Engineering Co., 61 Duke St.,
Toronto, Canada
Millen Mfg. Co., James, 150 Exchange St.,
Malden, Mass.
See Advertisement on Page 155
Dobson & Lomb, Inc., C. F., 2920 E. Washing-
ton St., Indianapolis, Ind.
See Advertisements on Pages 275 to 260
D. O'Monnell and Co., Inc., 314 Stuart St.,
Boston 16, Mass.
Pottier Co., 1810 Sheridan Rd., No. Chicago,
Chicago 13, Ill.
Radio Corp. of America, RCA Victor Div.,
Cadem, N. J.
See Advertisements on Inside Back Cover &
Back Cover
York 17, N. Y.
Sprague Electric Co., North Adams, Mass.,
Telephone Insulators, Inc., 307 W. North Ave.,
Chicago 47, Ill.
United Mfg. Co., 422 E. 138th St.,
New York 84, N. Y.

CARDIOTACHOMETERS
Electrodyne Co., The, 399 Boylston St.,
Boston, Mass.
Waters Conley Co., 501 First St., N. W.,
Rockefeller, Minn.
D-18

June, 1947—MID-MONTH—ELECTRONICS BUYERS' GUIDE
COILS—Pickup
Carron Mfg. Co., 415 S. Aberdeen St., Chicago 9, Ill.
Davis & Co., Dean W., Kentland, Ind.
Maddux Electrical Products Div., John G. Ruckelshaus Co., 74 Main St., Madison, Wis.
Precise Electronics, 614 W. 49th St., New York, N. Y.
Sorenson & Co., 375 Fairfield Ave., Stamford, Conn.
Super Electric Products Corp., 1957 Summit Ave., Jersey City, N. J.

COILS—Power & a-f Coils & Windings
Acme Wire Co., New Haven 14, Conn.
Aeroline Electronic Hardware Comp., 24 Cliff St., Jersey City, N. J.
Carron Mfg. Co., 415 S. Aberdeen St., Chicago 9, Ill.
Davis & Co., Dean W., Kentland, Ind.
Maddux Electrical Products Div., John G. Ruckelshaus Co., 74 Main St., Madison, Wis.
Precise Electronics, 614 W. 49th St., New York, N. Y.

COILS—r-f & l-f Receiving or Transmitting
Aeroline Electronic Hardware Comp., 24 Cliff St., Jersey City, N. J.

COILS—Relay & Solenoid
Acme Wire Co., New Haven 14, Conn.
Alloyed Control Comp., Inc., 2 East End Ave., New York 28, N. Y.

Electronics Buyers' Guide — June, 1947 — MID-MONTH
**ELECTRONIC and ALLIED PRODUCTS**

**COMMUNICATION SYSTEMS—Airport Traffic Control**
- Aero Communications, Inc., 231 Main St., Hempstead, N. Y.
- Automatic Electric Co., 193 W. Van Buren St., Chicago 7, Ill.
- Basko Radio, 500 S 2nd St., Ft. Lauderdale, Fla.
- Bendix Radio Div., Bendix Aviation Corp., Newark 4, N. J.
- Collins Radio Co., Cedar Rapids, Iowa
- See Advertisements on Pages 48A to 48D

**COMMUNICATION SYSTEMS—Carrier Systems**
- Western Sound & Electric Labs., Inc., 80 S. Blvd., N. Y.
- See Advertisements on Pages 48A to 48D

**COMMUNICATION SYSTEMS—Communicating Systems**
- Westinghouse Electronic Equipment Corp., 202 E. 18th St., New York 13, N. Y.
- Barone Co., S. A., 143 W. 22nd St., New York 11, N. Y.
- Collins Radio Co., Cedar Rapids, Iowa
- See Advertisements on Pages 48A to 48D

**COMMUNICATION SYSTEMS—Electronics Distribution**
- Western Electric Co., 235 Broadway, New York 7, N. Y.
- See Advertisements on Pages 88, 89

**COMMUNICATION SYSTEMS—Induction Systems**
- Barone Co., S. A., 143 W. 22nd St., New York 11, N. Y.
- Collins Radio Co., Cedar Rapids, Iowa
- See Advertisements on Pages 48A to 48D

**COMMUNICATION SYSTEMS—Marine Radio-Telephone**
- Aero Communications, Inc., 231 Main St., Hempstead, N. Y.
- Automatic Electric Co., 193 W. Van Buren St., Chicago 7, Ill.
- Basko Radio, 500 S 2nd St., Ft. Lauderdale, Fla.
- Bendix Radio Div., Bendix Aviation Corp., Newark 4, N. J.
- Collins Radio Co., Cedar Rapids, Iowa
- See Advertisements on Pages 48A to 48D

**COMMUNICATION SYSTEMS—Portable Installation**
- Aero Communications, Inc., 231 Main St., Hempstead, N. Y.
- Automatic Electric Co., 193 W. Van Buren St., Chicago 7, Ill.
- Basko Radio, 500 S 2nd St., Ft. Lauderdale, Fla.
- Bendix Radio Div., Bendix Aviation Corp., Newark 4, N. J.
- Collins Radio Co., Cedar Rapids, Iowa
- See Advertisements on Pages 48A to 48D

**COMMUNICATION SYSTEMS—Radio**
- Barone Co., S. A., 143 W. 22nd St., New York 11, N. Y.
- Collins Radio Co., Cedar Rapids, Iowa
- See Advertisements on Pages 48A to 48D

**COMMENTS**

**COMMUNICATION SYSTEMS**

**Electronic and Allied Products**

**ELECTRONICS BUYERS' GUIDE — June, 1947 — MID-MONTH**

**SUBMARINE TELEPHONE**
- Taylor Western Transmitters, Inc., 114 W. 22nd St., New York 11, N. Y.
- Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.

**COMMUNICATION SYSTEMS—Microwave**
- Barone Co., S. A., 143 W. 22nd St., New York 11, N. Y.
- Collins Radio Co., Cedar Rapids, Iowa
- See Advertisements on Pages 48A to 48D

**COMMUNICATION SYSTEMS—Radio**
- Barone Co., S. A., 143 W. 22nd St., New York 11, N. Y.
- Collins Radio Co., Cedar Rapids, Iowa
- See Advertisements on Pages 48A to 48D

**COMMUNICATION SYSTEMS—Radio-Telephone**
- Aero Communications, Inc., 231 Main St., Hempstead, N. Y.
- Automatic Electric Co., 193 W. Van Buren St., Chicago 7, Ill.
- Basko Radio, 500 S 2nd St., Ft. Lauderdale, Fla.
- Bendix Radio Div., Bendix Aviation Corp., Newark 4, N. J.
- Collins Radio Co., Cedar Rapids, Iowa
- See Advertisements on Pages 48A to 48D

**COMMUNICATION SYSTEMS—Radio Receptor Co.**
- 251 W. 19th St., New York 11, N. Y.
- See Advertisement on Page 213
**PAYMENTS**

Barone Co., S. A., 143 W. 22nd St., New York City, N. Y.

Collins Radio Co., Cedar Rapids, Iowa.

See Advertisements on Pages 50 to 53

Communications Co., 11916 W. Belmont Ave., New York 34, N. Y.

Ercol Radio, Inc., Peninmore Ave., Hempsdale, N. Y.

Federal Tele-Phone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.

See Advertisements on Pages 48A to 48D

General Electric Co., Syracuse, N. Y.

See Advertisements on Pages 96, 96A

Grady Instrument Co., 880 Davenport St., Belmont, Mass.

Haller-Wells Co., 4401 W. Fifth Ave., Chicago 24, Ill.


Harvey Wells Electronic, Inc., North St., Rockford, Ill.

Link, Fred M., 125 W. 17th St., New York 1, N. Y.

Pan American Electric Co., Inc., 2911 Atlantic Ave., Calif.

Rex, 500 S. 54th Ave., Miami, Fla.

See Advertisement on Page 213

Rhein Engineering, 120 W. North St., Chicago 10, Ill.

Pan American Electric Co., 6601 S. Laramie Ave., Chicago 35, III.


Oxford Radio Corp., 3911 W. 55th St., Chicago, III.

Radio Corp. of America, RCA Victor Div., Camden, N. J.

See Advertisement on Inside Back Cover & Back Cover, 251

Sears, Roebuck & Co., Inc., 4545 St. Paul St., Chicago 7, Ill.

Spark Gap and Funston Rds., Kansas City, 13, Mo.

See Advertisement on Page 88

Aireon Mfg. Corp., Fairfax Ave., Wash., D. C.

Compasses - Electronic Gyro

Eclipse Pioneer Div., Bendix Aviation Corp.


Spyro Gyroscope, Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80B

Sparrow, Inc., 117 North Main St., Brockton, 64, Mass.

American Phenolic Corp., 1830 5th Ave., Chicago 1, Ill.

See Advertisement on Page 23

Boston, Mass.

Westinghouse Electrical Corp., 2118 E. 55th St., Cleveland, Ohio

Burgess & Co., E. W., 2141 Madison Ave., Toledo 1, Ohio

Burrman Engineering Co., 197 Bruckner Bivd., New York 13, N. Y.

Cannon Electric Development Co., 3209 Humbold St., Los Angeles 21, Calif.

See Advertisement on Page 70

Dante Electric Co., West later, Conn.


Englewood Electrical Supply Co., 5501 S. Halsted St., Chicago 13, Ill.

Federal Tele-Phone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.

See Advertisement on Page 88

General Electric Co., 6601 S. Laramie Ave., Chicago 35, III.


Hadden Co., The, 17 Academy St., Newark 2, N. J.


Insuline Corp. of America, 33-02 25th St., Long Island City, N. Y.


Johnson Co., E. F., Wasco, Minn.

Kellogg Switchboard & Supply Co., 6659 S. Cicero Ave., Chicago 32, Ill.

Kline Co., 372 Classen Ave., Brooklyn 5, N. Y.

Lewis Engineering Co., 52 Rubber Ave., Eggertsville, N. Y.

Lowe Co., Frank W., 1300 Lewis Engineering Co., 1300 Lewis Ave., Fifteenth St., Phila.

Morse Co., Frank W., 1300 Lewis Ave., Fifteenth St., Phila.


Radio Corp. of America, RCA Victor Div., Camden, N. J.

See Advertisement on Inside Back Cover & Back Cover, 251

Sears, Roebuck & Co., Inc., 4545 St. Paul St., Chicago 7, Ill.

Spark Gap and Funston Rds., Kansas City, 13, Mo.

See Advertisement on Page 88

Aireon Mfg. Corp., Fairfax Ave., Wash., D. C.

Compasses - Electronic Gyro

Eclipse Pioneer Div., Bendix Aviation Corp.


Spyro Gyroscope, Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80B

Sparrow, Inc., 117 North Main St., Brockton, 64, Mass.

American Phenolic Corp., 1830 5th Ave., Chicago 1, Ill.

See Advertisement on Page 23

Boston, Mass.

Westinghouse Electric Corp., 2118 E. 55th St., Cleveland, Ohio

Burgess & Co., E. W., 2141 Madison Ave., Toledo 1, Ohio

Burrman Engineering Co., 197 Bruckner Bivd., New York 13, N. Y.

Cannon Electric Development Co., 3209 Humbold St., Los Angeles 21, Calif.

See Advertisement on Page 70

Dante Electric Co., West later, Conn.


Englewood Electrical Supply Co., 5501 S. Halsted St., Chicago 13, Ill.

Federal Tele-Phone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.

See Advertisement on Page 88

General Electric Co., 6601 S. Laramie Ave., Chicago 35, Ill.


Hadden Co., The, 17 Academy St., Newark 2, N. J.


Insuline Corp. of America, 33-02 25th St., Long Island City, N. Y.


Johnson Co., E. F., Wasco, Minn.

Kellogg Switchboard & Supply Co., 6659 S. Cicero Ave., Chicago 32, Ill.

Kline Co., 372 Classen Ave., Brooklyn 5, N. Y.

Lewis Engineering Co., 52 Rubber Ave., Eggertsville, N. Y.

Lowe Co., Frank W., 1300 Lewis Engineering Co., 1300 Lewis Ave., Fifteenth St., Phila.

Morse Co., Frank W., 1300 Lewis Ave., Fifteenth St., Phila.


Radio Corp. of America, RCA Victor Div., Camden, N. J.

See Advertisement on Inside Back Cover & Back Cover, 251

Sears, Roebuck & Co., Inc., 4545 St. Paul St., Chicago 7, Ill.

Spark Gap and Funston Rds., Kansas City, 13, Mo.

See Advertisement on Page 88

Aireon Mfg. Corp., Fairfax Ave., Wash., D. C.
CONTROLS—Printing

Electric Eye Equipment Co., 16 W. Fairchild St., Danville, Ill.

Fisher-Pierce Co., 70 Ceylon St., Boston 21, Mass.

See Advertisement on Page 163

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 60B, 96C

Lawrence Instruments Div., 37 W. 65th St., New York 23, N. Y.

Monitor Controller Co., 51 S. Gay St., Baltimore 2, Md.

Potter Instrument Co., 136-56 Roosevelt Ave., Flushing, N. Y.

See Advertisement on Page 163

Ripley Co., Torrington, Conn.

Collins Radio Co., Cedar Rapids, Iowa

See Advertisements on Pages 59 to 33

Commercial Radio Sound Corp., 205 E. 91st St., New York 28, N. Y.

COMMUNICATIONS—Register Cutter

Fisher-Pierce Co., 70 Ceylon St., Boston 21, Mass.

See Advertisement on Page 163

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 60B, 96C


Ripley Co., Torrington, Conn.

CONTROLS—Register Cutter

Fisher-Pierce Co., 70 Ceylon St., Boston 21, Mass.

See Advertisement on Page 163

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 60B, 96C


Ripley Co., Torrington, Conn.

CONTROLS—Register Cutter

Fisher-Pierce Co., 70 Ceylon St., Boston 21, Mass.

See Advertisement on Page 163

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 60B, 96C


Ripley Co., Torrington, Conn.

CONTROLS—Register Cutter

Fisher-Pierce Co., 70 Ceylon St., Boston 21, Mass.

See Advertisement on Page 163

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 60B, 96C


Ripley Co., Torrington, Conn.

CONTROLS—Smoke Density & Combustion

Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland, Ohio

Brown Instrument Co., 345 Madison Ave., New York 17, N. Y.

Electronic Apparatus Co., 347 Madison Ave., New York 17, N. Y.

Electro-Optical Control Corp., 110 E. Forest St., Detroit, Mich.

Electronic Products Co., 19 No. First St., Geneva, Ill.

Ess Instrument Co., 96 So. Washington Ave., Berneigung, N. Y.

Furth Electronics, 800 W. North Ave., Chicago, III.

See Advertisement on Page 154

Stereoviscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80B

Transistor Mfg. Co., Inc., 345 Hudson St., New York 14, N. Y.

White Eagle Mfg. Co., 82 N. 10th St., N. Y., N. Y.

White Depth Indicator Div., 10 E. 40th St., New York, N. Y.

White-Rodgers Electric Co., 105 Chambers St., New York, N. Y.

Yardney Laboratories Inc., 105 Chambers St., New York, N. Y.
CONTROLS—Tendering

Fisher-Pierce Co., 70 Ceylon St., Boston 21, Mass.
Etheron Electronics Co., 1231 Plashing Ave., Brooklyn 6, N. Y.

CONTROLs—Timing

Adams & Westlake Co., Michigan St., Elkhart, Ind.
See Advertisements on Pages 34, 35
Ampex Corp., 611 E. Garfield Ave., Glendale, Calif.
Ansonia Clock Co., Inc., 103 Lafayette St., Buffalo 1, N. Y.
Automatic Temperature Control Co., 18 W. 34th St., New York 1, N. Y.
Aviometer Corp., 220 W. 33rd St., New York 1, N. Y.
See Advertisement on Page 224
Bristol Co., The, Waterbury 21, Conn.
Champlin & Co., Inc., 125 W. 42nd St., New York 18, N. Y.
Cramer Co., R. W., Centerbrook, Conn.
See Advertisement on Page 225
Eagle Signal Corp., Moline, Ill.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
See Advertisement on Page 18
Electronic Apparatus, 1200 34th Madison Ave., New York 17, N. Y.
Electronic Lincoln, Inc., 44 Summer Ave., Newark, N. J.
Fisher-Pierce Co., 70 Ceylon St., Boston 21, Mass.
See Advertisement on Page 19
General Electric Co., 1200 Ninth Ave., New York 19, N. Y.
See Advertisement on Page 20
General Radio Co., 800 E. 6th St., Minneapolis 13, Minn.
General Signal Electronics, 51 Allen Ave., Glenview, Ill.
See Advertisements on Pages 60A, 60B
Harrison, A. W., The, Waterbury 22, Conn.
Kay Electric Co., 34 Marshall St., Newark, N. J.
See Advertisement on Page 184
Lancaster Instrument Div., Industrial Control Div., 77 W. 65th St., New York 23, N. Y.
Lakota Electric Co., 407 S. Dearborn St., Chicago, Ill.
Lummel Radio, Inc., 497 S. Dearborn St., Chicago, Ill.
Magazine Co., The, Fort Wayne 4, Ind.
Mercoid Corp., 4901 Bealmont Ave., Chicago 11, Ill.
Minneapolis-Honeywell Regulator Co., 2753 Fourth Ave., S., Minneapolis, Minn.
Field Controls, Inc., 2200 N. Michigan Ave., Chicago 11, Ill.
Phillips, J. E., 92 Madison Ave., New York 16, N. Y.
Pottier Instrument Co., 136-56 Roosevelt Ave., Flushing, N. Y.
See Advertisement on Page 243
Raytheon Electronic Co., 2800 W. Congress St., Chicago 12, Ill.
Rheem, Inc., 1200 W. North St., Springfield, Ohio
Ripley Co., 1500 W. Vermont Ave., Burbank, Calif.
Scoty Bros., 4915 W. 67th St., Chicago 38, Ill.
Taggart Products Co., 559 Park Ave., Brooklyn 5, N. Y.
Telechron Inc., Homer Ave., Ashland, Mass.

CONTROLs—Torque Units

Breeze Corp., 41 S. 6th St., Newark, N. J.
General Aviation Equipment Co., 620 35th Ave., New York 26, N. Y.
Reeves-Huffman Corp., 215 E. 81st St., New York 28, N. Y.
See Advertisement on Page 186
Reeves-Huffman Corp., 215 E. 81st St., New York, N. Y.
Rochette Electric, 102 Fair Oaks Ave., South Pasadena, Calif.
Sorensen & Co., 375 Fairfax Ave., Stamford, Conn.
See Advertisement on Page 138

CONTROLs—Ultrasonic

Ripley Co., Torrington, Conn.
Torrington Products, 2466 West Irving Park Road, Chicago 34, Ill.

CONTROLs—Volume & Tone

Centralab, Div. of Globe Union Inc., 900 Keefe Ave., Milwaukee 1, Wis.
See Advertisements on Pages 24, 25
Chicago Telephone Supply Co., 1142 W. Beardlay Ave., Elkhart, Ind.
Cinema Electronic Corp., 71 W. Verdugo Ave., Burbank, Calif.
Consolidated Wire & Associated Companies, 1655 S. Clinton St., Chicago 16, Ill.
Daven Co., 191 Central Ave., Newark 4, N. J.
General Electric Co., Syracuse, N. Y.
See Advertisements on Pages 90, 96A
Kellogg Switchboard & Supply Co., 6560 N. Cicero Ave., Chicago 38, Ill.
Mallory & Co., Inc., F. R., 3029 W. Washington St., Indianapolis 6, Ind.
See Advertisements on Pages 257 to 260
National Union Radio Corp., 350 Scotland Blvd., Beachwood, Ohio
Owens-Illinois Glass Co., Plastics Div., Toledo 1, Ohio
Ward Leonard Electric Co., 31 South St., Mt. Vernon, N. Y.
See Advertisement on Page 175
White-Rodgers Electric Co., 1203 Cass Ave., St. Louis 6, Mo.

CONTROLs—Welding

Bohme Inc., 1475 Broadway, New York 23, N. Y.
Chicago Telephone Supply Co., 61 Sherman St., Malden 48, Mass.
Rhein Engineering, 220 W. North St., Springfield, Ohio
Ripley Co., Torrington, Conn.
Scakly Bros., 4915 W. 67th St., Chicago 38, III.
Vantronic Corp., 87 Washburn St., Bridgeport, Conn.

CONVERTERS

Collins Audio Products Co., 154 Park St., Westfield, N. J.
See Advertisement on Page 253
Communication Measurements Lab. Inc., 120 Green St., New York, N. Y.
Electrodyne Co., The, 899 Boylston St., Boston 18, Mass.
Fisher Radio Co., 41 E. 47th St., New York, N. Y.
Hall-Rhett Co., 4401 W. Fifth Ave., Chicago 24, Ill.
Hoffman Radio Corp., 3430 S. Hill St., Los Angeles 7, Calif.
Magnavox Co., The, The Fort Wayne 4, Ind.
See Advertisement on Page 78

CONVERTERS—Frequency Shift

Bohme Inc., H. O., 215 Broadway, New York, N. Y.
Bogue Electric Co., 37 Kentucky Ave., Paterson 2, N. J.
Collins Radio Co., Cedar Rapids, Iowa
See Advertisements on Pages 88 to 33
Electronic Measurements Co., Red Bank, N. J.
See Advertisement on Page 68
Feder Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.
See Advertisements on Pages 88 to 48D
See Advertisement on Page 78
Western Electric Co., Inc., 195 Broadway, New York, N. Y.
See Advertisements on Pages 88, 89
CONVERTERS—Low Frequency
Amplifier Corp. of America, 356 Broadway, New York, N. Y.
Elecro, Inc., 1060 6th Ave., New York, N. Y.

CONVERTERS—Vibrator Type
American Television & Radio Co., 300 E. 4th St., Paul 1, Minn.
Clamater Corp. Inc., 250-51 6th Ave., Brooklyn, N. Y.
Cover Dual Signal Systems, Inc. Div. of General Drive Systems, Inc., 150 W. 14th St., New York, N. Y.
General Cable Corp., 420 Lexington Ave., New York, N. Y.
General Electric Co., 1515 W. Howard Ave., Chicago, Ill.
General Electric Co., 420 Lexington Ave., New York, N. Y.

Cord Sets
American Insulated Wire Corp., 25 Fox St., New Haven, Conn.
Alden Products Co., 117 No. Main St., Brockton, Mass.
Alpha Wire Corp., 60 Howard St., New York, N. Y.
American Electric Cable Co., Holyoke, Mass.
Avionator Corp., 350 W. 30th St., New York, N. Y.

Cords—Dial Cords & Cables
Aeroite Electronic Hardware Corp., 24 Cliff St., Jersey City, N. J.
See Advertisement on Page 246
Alpha Corp., 60 Howard St., New York, N. Y.
American Electric Cable Co., Holyoke, Mass.

Cords—Line
Accurate Insulated Wire Corp., 25 Fox St., New Haven, Conn.
Aeroite Electronic Hardware Corp., 24 Cliff St., Jersey City, N. J.
See Advertisement on Page 246
Alpha Corp., 60 Howard St., New York, N. Y.
American Electric Cable Co., Holyoke, Mass.

Cords—Parich
Alden Products Co., 117 No. Main St., Brockton, Mass.
Amalgamated Radio Television Corp., 476 Broadway, New York 15, N. Y.
Audio Development Co., 2832 13th Ave., S., Minneapolis, Minn.
See Advertisement on Page 26
Avionator Corp., 370 W. 30th St., New York, N. Y.

Cores—Ceramic
Electrical Refractories Co., 50 Clark St., East Palestine, Ohio

Cores—Hiperroll

Cores—Iron
Crystal Products Co., 1519 McGee Traffic-way, Kansas City, Mo.

Billey Electric Co., 1416 McGee St., Kansas City, Mo.

North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.


Reeves-Hoffman Corp., 215 E. 91st St., New York, N. Y.

See Advertisement on Page 180

Scientific Radio Products Co., 738 W. Broadway, Council Bluffs, Iowa.

Scientific Radio Service, 4301 Sheridan St., University Park, Pa.

Sentry Crystal Co., 206 S. Washington St., Chicago, Ill.


Standard Crystal Corp., 441 East Gregory, Chicago, Ill.

Valpey Crystals, 551 Madison Ave., New York, N. Y.

Virginia Crystals, High Hill, Holliston, Mass.

Western Electric Co., Inc., 195 Broadway, New York, N. Y.

American Gem & Pearl Co., 6 West 48th St., New York 19, N. Y.

Bassett, Inc., R. E. 500 S. E. Second St., Lakewood, Wash.

Billey Electric Co., Union Station Bldg., Erie, Pa.


Commercial Equipment Co., 1416 McGee St., Kansas City, Mo.

Dallons Labs., 5066 Highland St., Pittsburgh, Pa.

Federal Telephone and Radio Corp., 1941-1948 DIRECTORY, New York, N. Y.

FiXSTAL—Microwave

Radio Corp., Boonton, N. J.

Commerical Equipment Co., 1411 McGee St., Kansas City, Mo.

Hunt Corp., The, 544 Hanover St., Carlisle, Pa.

Kemlite Labs., 1809 N. Ashland Ave., Chicago, Ill.

Knights Co., James, 131 S. Wells St., Chicago, Ill.

Miller, August E., 9226 Hudson Blvd., North Bergen, N. J.

Monitor Products Co., 815 Fremont St., So. Pasadena, Calif.

North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.

Premier Crystal Labs, Inc., 63 Park Row, New York, N. Y.


Reeves-Hoffman Corp., 215 E. 91st St., New York, N. Y.

See Advertisement on Page 180

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Dallons Labs., 5066 Highland St., Pittsburgh, Pa.

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FiXSTAL—Microwave

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Kemlite Labs., 1809 N. Ashland Ave., Chicago, Ill.

Knights Co., James, 131 S. Wells St., Chicago, Ill.

Miller, August E., 9226 Hudson Blvd., North Bergen, N. J.

Monitor Products Co., 815 Fremont St., So. Pasadena, Calif.

North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.

Premier Crystal Labs, Inc., 63 Park Row, New York, N. Y.


Reeves-Hoffman Corp., 215 E. 91st St., New York, N. Y.

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Scientific Radio Service, 4301 Sheridan St., University Park, Pa.

Sentry Crystal Co., 206 S. Washington St., Chicago, Ill.


Standard Crystal Corp., 441 East Gregory, Chicago, Ill.

Valpey Crystals, High Hill, Holliston, Mass.

Western Electric Co., Inc., 195 Broadway, New York, N. Y.
ELECTRONIC and ALLIED PRODUCTS

CRYS'TALS—Rockelle Salt
Brush Development Co., The, 2405 Perkins Ave., Cleveland 14, Ohio
Tibbetts Industries, Inc., Camden, Maine

CRYS'TALS—Silicon
Commercial Equipment Co., 1116 McGee St., Kansas City, Mo.
Western Electric Co., Inc., 195 Broadway, New York, N. Y.
See Advertisements on Pages 88, 89

CRYS'TALS—Tourmaline
Hudson American Corp., 25 W. 43rd St., New York, N. Y.
Miller, August E., 9226 Hudson Blvd., North Bergen, N. J.
Premier Crystal Labs., Inc., 63 Park Ave., Jersey City, N. J.
Reaves-Hoffman Co., 213 E. 91st St., New York, N. Y.
See Advertisement on Page 180

DECADE BOXES—Capacitance
Brown Engineering Co., 4625 S. E. Hawthorne Blvd., Portland 15, Oregon
Free Transformer Co., 12 Spring St., New York 12, N. Y.
Harvey Wells Electronics, Inc., North St., Southbridge, Mass.
Inductive Instruments, Inc., 17 Pollock Ave., Jersey City 5, N. J.
Metropolitan Electronic & Instrument Co., Inc., 14 Murray St., New York 7, N. Y.
Winslow Co., 9 Liberty St., Newark 5, N. J.

DECADE BOXES—Inductance
Burnell & Co., 45 Warburton Ave., Yonkers 2, N. Y.
See Advertisement on Page 192
Free Transformer Co., 72 Spring St., New York 12, N. Y.
See Advertisement on Page 233
Harvey Wells Electronics, Inc., North St., Southbridge, Mass.
Magazine Products Corp., The, The Norwalk, Conn.
Metropolitan Electronic & Instrument Co., 6 Murray St., New York 7, N. Y.
New York Transformer Co., Alpha, N. J.
See Advertisement on Page 165
Transformer Products Inc., 145 W. 1st St., New York 14, N. Y.
United Transformer Corp., 150 Varick St., New York 13, N. Y.
See Advertisement on Inside Front Cover

DECADE BOXES—Resistance
American Radio Co., 611 E. Garfield Ave., Glendale, Calif.
Brown Engineering Co., 4635 S. E. Hawthorne Blvd., Portland 15, Oregon
Claymont Instruments Inc., 248-2 8th St., Brooklyn, N. Y.
Daven Co., 191 Central Ave., Newark 4, N. J.
Electrodyne Co., The, 899 Boylston St., Boston 15, Mass.
Electronic Development Lab., 2655 W. 19th St., Chicago 8, Ill.
Harvey Wells Electronics Inc., North St., Southbridge, Mass.
Herbach & Redeman Inc., 517 Ludlow St., Phila, 6, Pa.
Inductive Instruments Inc., 17 Pollock Ave., Jersey City 5, N. J.
MacLeod & Hammar, 24 Chelsea St., Charles-town 29, Mass.

DENSITOMETERS
Communication Measurements Lab., Inc., 120 Greenwich St., New York, N. Y.
Eastman Kodak Co., Industrial Photographic Sales Div., 244 State St., Rochester 4, N. Y.
Electronic Mechanical Products Co., 13-15 N. Virginia Ave., Atlantic City, N. J.
Long Co., L. J., 18 Grand St., New York 13, N. Y.
Madison Electrical Prod. Co., 618 Frelinghuysen Ave., Newark 5, N. J.

DETECTORS—Crystal
Aircraft Radio Corp., Boonton, N. J.
See Advertisement on Page 185
Carbonburg Co., Globar Div., Niagara Falls, N. Y.
Insuline Corp. of America, 36-02 35th Ave., Long Island City, N. Y.
See Advertisement on Page 166
Serry Gyroscope Co., Inc., Great Neck, L. I., N. Y.
See Advertisements on Pages 80A, 80B
Sylvania Electric Products, Inc., 500 5th Ave., New York 18, N. Y.
See Advertisements on Pages 158 to 161
Televoid Products, Inc., 7466 West marble Park Rd., Chicago 34, Ill.

DETECTORS—Crystal Germanium
Caron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
Sylvania Electric Products, Inc., 500 5th Ave., New York 18, N. Y.
See Advertisements on Pages 158 to 161

DETECTORS—Crystal Silicon
Sylvania Electric Products, Inc., 500 5th Ave., New York 18, N. Y.
See Advertisements on Pages 158 to 161

DETECTORS—Explosive Gas
Busing Meter Co., 1048 Ivanhoe Rd., Canton, Ohio
Cardo Co., 151 North Ave., Long Beach, Calif.
Heliand Research Corp., 15 E. 5th St., Denver 3, Colo.

DETECTORS—Flaw & Defect
Brannon Instruments, Inc., Joe's Hill Rd., Danbury, Conn.
Brush Development Co., The, 3405 Perkins Ave., Cleveland 14, Ohio
Dial Engineering Co., Inc., The, 1818 Ashland St., Houston 8, Tex.
Electronic Engineers, 1039-B Pacific St., Santa Monica, Calif.
General Electric Co., Schenectady 5, N. Y.
See Advertisements on Pages 96B, 96C
Global Phone Mfg. Co., 2 Linden St., Reading, Mass.
Gerry Products Inc., 15th & Willow Ave., Hoboken, N. J.

DETECTORS—Galena
Carron Mfg. Co., 415 S. Aberdeen St., Chicago, Ill.
Insuline Corp. of America, 36-02 35th Ave., Long Island City, N. Y.
See Advertisement on Page 166

DETECTORS—Mercury Vapor
General Electric Co., Schenectady 5, N. Y.
See Advertisements on Pages 96B, 96C

DETECTORS—Null
Fried Transformer Co., 72 Spring St., New York 12, N. Y.
See Advertisement on Page 233
Sherron Electronics Co., 1201 Bushing Ave., Brooklyn 6, N. Y.
See Advertisement on Page 76

DETECTORS—r-f Null
Sherron Electronics Co., 1201 Bushing Ave., Brooklyn 6, N. Y.

DETECTORS—Vibration
Brush Development Co., The, 3405 Perkins Ave., Cleveland 14, Ohio
Consolidated Engineering Corp., 595 E. 34th St., New York 16, N. Y.
Electronic Control Corp., 1575 E. Forest St., Detroit, Mich.
General Electric Co., Schenectady 5, N. Y.
See Advertisements on Pages 96B, 96C
Hathaway Instrument Co., 1315 S. Clarkson St., Denver 16, Colo.
Heliand Research Corp., 150 E. 5th St., Denver 9, Colo.
Shure Brothers, 225 W. Huron St., Chicago, Ill.
See Advertisement on Page 157
Serry Gyroscope Co., Inc., Great Neck, L. I., N. Y.
See Advertisements on Pages 80A, 80B

DIAL CRYSTALS
Dial Instruments Co., 335 Throop Ave., Brooklyn 30, N. Y.
Chicago Die Mold Corp., 6901 Wrightwood Ave., Chicago 16, III.
Croname, Inc., 3701 Ravenswood Ave., Chicago 11, III.
Emeloid Co., Inc., 291 Laurel Ave., Long Island City, N. Y.
Etched Products Corp., 39-01 Queens Blvd., Long Island City, N. Y.

DIALS
Lombard Instruments Co., 14414 to 84th Ave., Bellwood, 10, Ill.
ELECTRONIC and ALLIED PRODUCTS

Speediplas Metal Specialties, 2199 E. 21st St., Brooklyn 17, N. Y.
Swanson Tool & Machine Co., 810-14 E. 8th St., Erie, Pa.
Switech, Inc., 2406 Denver Diversey Parkway, Chicago, Ill.
Thomas & Skinner Steel Products Co., 1122 3rd St., Indianapolis 5, Ind.
Tri-United Metals Corp., 380 Nye Ave., Irvington, N. J.
Vlewco Inc. Div. of Andrews & Perillo, 59-35 30 Crescent St., Long Island City, N. Y.
Walter Co., S., 144 Centre Ave., Brooklyn 21, N. Y.
Whistler & Sons, Inc., S. B., 782 Military Rd., Buffalo 17, N. Y.

DILATOMETERS—Automatic Recording
Bristol Co., The, Waterbury 21, Conn.
Sylvania Electric Products, Inc., 800 5th Ave., New York 18, N. Y.
See Advertisements on Pages 158 to 161

DISCS—Blank Recording
Advance Recording Products Co., 26-12 24th Ave., New York 10, N. Y.
Allied Recording Products Co., 21-09 43rd Rd., Ridgewood, N. J.
Audio-Matic Co., 38-12 34th St., L. L City, N. Y.
Gould Moody Co., 395 Broadway, New York, N. Y.
See Advertisement on Page 91
Presco Recording Co., 242 W. 55th St., New York, N. Y.
Recording Co., 376 Broadway, New York.
Recotone Corp., 212 Fifth Ave., New York.
Reeves Soundcraft Corp., 10 E. 52nd St., Chicago 1, Ill.
See Advertisement on Page 268
Sound Devices Co., 150 East 111th St., New York 28, N. Y.
Wilcox-Gay Corp., Traverse City, Mich.
Zeph Productions, 160 E. 111th St., New York 28, N. Y.

DRAFTING EQUIPMENT
American Photocopy Equipment Co., 3249 N. Clark St., Chicago, Ill.
Arthur Finishing Co., Providence, R. I.
Bruning Co., Inc., Charles, 4700 Montrose Ave., Chicago 41, Ill.
Cardinal Corp., Montclair, N. J.
Dicken & Co., Eugene, 2425 Sheffield Ave., Chicago, Ill.
Dixon Cruchle Co., Joseph, Jersey City, N. J.
Eagle Penll Co., 708 East 13th St., New York 28, N. Y.
Eberhard Faber Pencil Co., 37 Greenpoint Ave., Brooklyn 32, N. Y.
Engineers Specialties Div., Universal Engraving Colorplate Co., 364 Efficient Ave., Buffalo 9, N. Y.
Faber, Inc., A. W., 41 Dickerson St., New York.
Jiffy Sales Co., 1820 East 57th St., Cleveland 10, Ohio.
Keuffel & Esser Co., Hoboken, N. J.
Koehler Bros Pencil Co., Bloomingburg, N. J.
National Co., Inc. 61 Sherman St., Malden 48, Mass.

See Advertisement on Page 78
Paragon-Revolute Corp., 71 South Ave., Irondequoit.
Pock & Harvey, 5736-38 N. Western Ave., Chicago 1, Ill.
United States Blue Print Paper Co., 207 S. Wabash Ave., Chicago 3, Ill.
Universal Drafting Machine Co., 3110 Payne Ave., Cleveland 14, Ohio.

Well & J. H., 1315 Cherry St, Phila., Pa.

DIRECORS—Recording
Clarke Instrument Co., 910 King St., Silver Spring, Md.
Western Electric Co., Inc. 185 Broadway, New York 7, N. Y.
See Advertisements on Pages 88, 89

DRIVES—Antenna Mechanical
Foote Brothers Gear & Machine Corp., 5225 S. Western Blvd., Chicago 3, Ill.

DRIVES—Small Electric Drive Mechanisms
Kollman Instrument Div. of Square D Co., 89-08 45th Ave., Elmhurst, N. Y.
Magnetic Products Corp., The, Norwalk, Conn.
Price Electric Corp., East Church and 2nd St., Frederick, Md.

DRIERS—Dehydration and Drying
Barrett Co., Leon J., P. O. Box 378, Worcester 1, Mass.
Dempsey-Owen Co., 619 S. Eight St., Minneapolis 14, Minn.
Electronic Processes Corp., 249 Richards Rd, Ridgewood, N. J.
Fostoria Pressed Steel Corp., Fostoria, Ohio.
Hass-Hoffman Corp., 315 E. 91st St., New York, N. Y.
See Advertisement on Page 180

DYNAMOTORS
Continental Electric Co., Inc., 223-327 Ferry St., Newark 6, N. J.
Dillon & Co., Inc. W. C., 5410 W. Harrison Blvd., Chicago 41, Ill.
Electrical Products Co., 1725 Clarkstone Rd., Des Moines 12, Iowa.
General Electric Co., Schenectady 5, N. Y.
Hathaway Instrument Co., 1215 S. Clarkson St., Denver 4, Colo.
L. A. B. Corp., 51 Union Pl., Summit, N. J.
Lear, Inc., 110 Indiana Ave., Fort Wayne 2, Mich.
Rawson Electrical Co., 110 Potter St., Cambridge 37, Mass.
Ridgewood Co., 12 W. Broadway, New York 22, N. Y.
See Advertisement on Page 180

DYNAMO-METERS
Electro Physical Laboratories, Div. of Electro-Medics Corp. of America, 25 W. 18th St., New York 11, Conn.
Electro-Physical Laboratories Div. of Electro-Medics Corp. of America, 25 W. 18th St., New York 11, N. Y.
See Advertisement on Page 214
Triplet Electronics Instrument Co., 286 Harmon Road, Buffalo, Ohio.

ELECTRODYNAMOMETERS
Process & Instruments, 69 Greenpoint Ave., Brooklyn 22, N. Y.
Rawson Electrical Instrument Co., 110 N. Kedzie Ave., Chicago 25, Ill.
Rahn Instruments, Inc., 12 W. Broadway, New York 7, N. Y.
Thermionic Engineering Corp., Ponton Plains, N. J.

ELECTROENCEPHALOGRAphs
Electro-Physical Laboratories Div. of Electro-Medics Corp. of America, 25 W. 18th St., New York 11, Conn.
See Advertisement on Page 180

ELECTRO-SHOCK THERAPY
Arladco Inc., Melrose Ave & Battery Pl., Stampa, Conn.
Bogota, David, 663 Broadway, New York 12, N. Y.
Edin Electronics Co., 207 Main St., Worchester, Mass.
Electro-Physical Laboratories Div. of Electro-Medics Corp. of America, 20 W. 18th St., New York 11, N. Y.
Electronic Supply Co., 207 N. Kedzie Ave., Chicago 25, Ill.
Offner Electronic Corp., Inc. 5200 N. Kedzie Ave., Chicago 37, Ill.
Rahn Instruments, Inc., 12 W. Broadway, New York 7, N. Y.
Thermionic Engineering Corp., Ponton Plains, N. J.

ELECTRO-SHOCK THERAPY APPARATUS

Aerolight Corp., 655 11th Ave., New York 19, N. Y.
Electrodynamic Co., N. Y., 599 Boylston St., Boston, Mass.
Edin Electronics Co., 207 Main St., Worchester, Mass.
Edin Medial Lab. Inc., 8066 Santa Monica Blvd., Los Angeles, Calif.
Electronic Supply Co., 207 Main St., Worchester, Mass.
Lektra Labs, 30 E. 19th St., New York 11, N. Y.
Rahn Instruments, Inc. 12 W. Broadway, New York 7, N. Y.

ELECTRO-SURGICAL APPARATUS
Araladco Inc., Melrose Ave & Battery Pl., Stampa, Conn.
Bogota, David, 663 Broadway, New York 12, N. Y.
Dallons Labs., 8066 Santa Monica Blvd., Los Angeles 25, Calif.
Electronic Supply Co., 207 Main St., Worchester, Mass.
Lektra Labs, 30 E. 19th St., New York 11, N. Y.
Lieber-Faehrmel Co., 303 W. Third St., Cincinnati, Ohio.
Mooradian, High Frequency Labs, 137 Park Place, Bogota, N. J.
Proson & Instruments, 400 Greenpoint Ave., Brooklyn 22, N. Y.

ELECTRONIC and ALLIED PRODUCTS

ELECTRO-SURGICAL APPARATUS

Araladco Inc., Melrose Ave & Battery Pl., Stampa, Conn.
Bogota, David, 663 Broadway, New York 12, N. Y.
Dallons Labs., 8066 Santa Monica Blvd., Los Angeles 25, Calif.
Electronic Supply Co., 207 Main St., Worchester, Mass.
Hathaway Instrument Co., 1115 S. Clarkson St., Denver 4, Colo.
Rahn Instruments, Inc., 12 W. Broadway, New York 7, N. Y.
Sanborn Co., 29 Osborne St., Cambridge 38, N. J.
Thermionic Engineering Corp., Ponton Plains, N. J.

ELECTRO-SURGICAL APPARATUS
FINISHES

Egyptian Lacquer Mfg. Co., 1270 Sixth Ave., New York, N. Y.
Franklin Paint & Varnish Co., Benjamin, 1825 haup Street, Philadelphia 4, Pa.

See Advertisement on Page 90

Horse Co., A. C., 43-86 Thenth St., L. I.
Insulation Mfg. Co., 11 New York Ave., Brooklyn, N. Y.
Maas & Waldstein Co., 438 Riverside Ave., New York, N. Y.

See Advertisement on Page 53

Midland Paint & Varnish Co., 1115 Rono Ave., Cleveland, Ohio

Maas & Waldstein Co., 955 W. Washington Blvd., Chicago 6, Ill.

See Advertisement on Page 87

Maas & Waldstein Co., 438 Riverside Ave., New York, N. Y.

See Advertisement on Page 53


FLEXIBLE SHAFT EQUIPMENT

See Machines

FLOCK & FLOCKED PAPER

Colman Electric Co., 318 Madison St., Maywood, Ill.
Farrington Optical Co., Inc., Brook Blvd. at 28th St., New York 66, N. Y.

FLUX-Brazing Compounds

Chase Brass & Copper Co., Inc., Waterbury, Conn.
Division Lead Co., 356 W. Kinzie St., Chicago 22, Ill.
Do-All Co., 4011 Washington Ave., St., Minneapolis 4, Minn.
Eutectic Welding Alloys Co., 40 Worth St., New York 12, N. Y.
Goldsmith Bros., Smelting & Refining Co., 86 E. Washington St., Chicago 3, Ill.
Handy & Harman, 82 Fulton St., New York 7, N. Y.
Special Chemicals Co., 30 Irving Pl., New York 7, N. Y.
Superior Flux Co., 913 Public Square Bldg., Cleveland 12, Ohio
Westinghouse Electric Corp., Motor Div., Buffalo, N. Y.

FLUX—Soldering

American Solder & Flux Co., 2132 E. Norris Ave., St. Louis, Mo.
Burns Brass & Copper Co., Inc., St. Louis, Mo.

See Advertisement on Page 10

Division Lead Co., 383 W. Kinzie St., Chicago 22, Ill.

See Advertisement on Page 76

Eutectic Welding Alloys Co., 40 Worth St., New York 12, N. Y.

See Advertisement on Page 53

FLUXMETERS

Clark Instrument Corp., 910 King St., Baltimore, Md.

See Advertisement on Page 178

General Electric Co., 2875 5th Ave., New York 5, N. Y.

FLUX—Brazing Compounds

American Platinum Works, N. J. R. R. Ave. At Olver St., New York City 4, N. Y.

See Advertisement on Page 253

Division Lead Co., 356 W. Kinzie St., Chicago 22, Ill.
Eutectic Welding Alloys Co., 40 Worth St., New York 12, N. Y.
Goldsmith Bros., Smelting & Refining Co., 86 E. Washington St., Chicago 3, Ill.
Handy & Harman, 82 Fulton St., New York 7, N. Y.
Johnson & Co., Lloyd S., 2241 Indiana Ave.
Johnson Gas Appliance Co., 514 E. 14th St., Chicago 14, Ill.
Kester Solder Co., 4212 Wrightwood Ave., Chicago 11, Ill.
Lincoln Chemical Co., 29 E. Madison St., Chicago 2, III.
Marwin Co., Inc., Rahway, N. J.
Mitchell Rand Instrument Co., Inc., 51 Murray St., New York 7, N. Y.

See Advertisement on Page 53

FLUXMETERS

Clarke Instrument Corp., 910 King St., Baltimore, Md.

See Advertisement on Page 10

General Electric Co., 2875 5th Ave., New York 5, N. Y.

See Advertisement on Page 250

Hickok Electrical Instruments Co., 10534 Dupont Ave., Cleveland, Ohio
Malloy & Co., Inc., 25 North 3rd St., Minneapolis 7, Minn.
Marion Electrical Instrument Co., Maywood, Ill.
Rawson Electrical Instrument Co., 110 Pot-ter St., Cambridge, Mass.

See Advertisement on Page 244

FORKS—Electrically Driven Tuning

Automatic Electric Co., 1033 W. Van Buren St., Chicago, Ill.

See Advertisement on Page 250

FORKS—Antenna

Automatic Electric Co., 1033 W. Van Buren St., Chicago, Ill.

See Advertisement on Page 250

FORKS—Electrically Driven Tuning

Electric Tachometer Corp., 330 E. 31st St., New York 1, N. Y.

See Advertisement on Page 250

FORKS—Antenna

Automatic Electric Co., 1033 W. Van Buren St., Chicago, Ill.

See Advertisement on Page 250

Tachometer Corp., 330 E. 31st St., New York 1, N. Y.

See Advertisement on Page 244

Automatic Electric Co., 1033 W. Van Buren St., Chicago, Ill.

See Advertisement on Page 250

FORKS—Antenna

Automatic Electric Co., 1033 W. Van Buren St., Chicago, Ill.

See Advertisement on Page 250

Tachometer Corp., 330 E. 31st St., New York 1, N. Y.

See Advertisement on Page 244

Automatic Electric Co., 1033 W. Van Buren St., Chicago, Ill.
ELECTRONIC and ALLIED PRODUCTS

FORMS—Choke
Centralab, Div. of Globe Union, Inc., 900 Kent Ave., Brooklyn, N. Y.
Millen Mfg. Co., D. M., 36-02 35th Ave., Long Island City, N. Y.
See Advertisements on Page 25, 26.

INSULATION—Wire
Cuyahoga Spring Co., 10723 Berea Rd., Cleveland, Ohio
Grammes & Sons Inc., L. 9, 38 Union St., Altenberg, Pa.
Heany Bros., Plainfield, N. J.
Hubbard Spring Co., M. D., Central Ave., Columbus, Ohio
Reliable Spring & Wire Forms Co., Fulton Rd. & Paris Ave., Cleveland, Ohio
Tichener & Co., E. H., Binghamton, N. Y.

MAGNETOS—Misc.
Bud Radio Inc., 2118 E. Buggie & Co., H. H., 3489 N. Clark St., Chicago 14, III.
Consolidated Electric Wire & Cable Co., 350 T. S., Chicago 19, Ill.
Corning Glass Works, Corning, N. Y.
General Ceramics & Steatite Co., 1 Central Ave., Brooklyn 5, N. Y.
Joyner Corp.' The, 462 N. Johnson Co., E. F., Waseca, Minn.
Insuline Corp. of America, 36-02 35th Ave., Long Island City, N. Y.
See Advertisements on Pages 24, 25.

FORMS—Wire
Art Wire & Stamping Co., 227 High St., Newark 2, N. J.
Cuyahoga Spring Co., 10723 Berea Rd., Cleveland, Ohio
Grammes & Sons Inc., L. F., 38 Union St., Altenberg, Pa.
Heany Bros., Plainfield, N. J.
Hubbard Spring Co., M. D., Central Ave., Columbus, Ohio
Reliable Spring & Wire Forms Co., Fulton Rd. & Paris Ave., Cleveland, Ohio
Tichener & Co., E. H., Binghamton, N. Y.

FREQUENCY STANDARDS
See Crystals

FRITS—Resistor

FUSES
Bassman Mfg. Co., St. Louis 7, Mo.
Commercial Enclosed Fuse Co., Schenectady, N. Y.
Commercial Enclosed Fuse Co., of N. J., 1317 Willard Ave., Hoboken, N. J.
Electro Motive AVE, Cleveland 8, Ohio
Chicago 11th Ave., Chicago 41, Ill.
Littlefuse, Inc., 1457 Ravenswood Ave., Chicago 14, Ill.
Pierce Renzale Fuses, Inc., 211 Hertel Ave., Buffalo 7, N. Y.
Trico Fuse Mfg. Co., 2948 N. Fifth, Milwaukee 12, Wis.

GAGES—Comparator
Do-All Co., 1301 Washington Ave., S. Minneapolis, Minn.
Electronic Development Co., 4240 N. 23rd St., Omaha 11, Nebraska
Foose & Pierson & Co., Inc., 75 Hudson St., New York 13, N. Y.
Hathaway Instrument Co., 1215 S. Clark St., Denver 3, Colo.
International Merit Products Corp., 254 W. 44th St., New York 19, N. Y.
Moton Instrument Co., 412 Lincoln St., Binghamton, N. Y.
Panoramic Radio Corp., 242 W. 55th St., New York 19, N. Y.
Scherr, Geo. D., 200 Lafayette St., New York 13, N. Y.
Sheffield Corp., The, Dayton 1, Ohio
Statham Labs., 8222 Sunset Blvd., Los Angeles 34, Calif.
Sparkle Tool Co., Inc., 2531-35 North Pulaski Road, Chicago 41, Ill.

GAGES—Displacement Measuring
Hathaway Instrument Co., 1215 S. Clark St., Denver 3, Colo.

GAGES—Electronic Fuel Indicator
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
See Advertisement on Page 18.

GAGES—Electronic Inspection
Autotron Co., Danville, Ill.
Bradner Instruments, Inc., Joe's Hill Rd., Danbury, Conn.
See Advertisements on Pages 96-97.

GAGES—Electronic Spring Checking
Hathaway Instrument Co., 1315 S. Clarkson St., Denver 3, Colo.
Link Engineering Co., 13581 Elmiria St., Detroit 27, Mich.

GAGES—Ionization
Herbach & Rudeman Inc., 617 Ludlow St., Dayton 5, Pa.
National Union Radio Corp., 350 Scotland Ave., Orange, N. J.
Process & Instruments, 60 Greenpoint Ave., Brooklyn 32, N. Y.
Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.
See Advertisements on Pages 80A, 80B.

GAGES—Photoelectric Dimension
Electric Eye Equipment Co., 16 W. Fairchild St., Danville, Ill.

GAGES—Point Depth
Electronic Control Corp., 1573 E. Forest St., Detroit, Mich.
General Electric Co., Schenectady S. Y.
See Advertisements on Pages 90B, 96C.

GAGES—Pirani
Ballantine Labs., Inc., Boonton, N. J.
See Advertisement on Page 42.

ELECTRONICS BUYERS' GUIDE—June, 1947—MID-MONTH
D-41
ELECTRONIC and ALLIED PRODUCTS

Radio-Television Institute, Inc., 480 Lexington Ave., New York 17, N. Y.

ELECTRONIC and Sperry Gyroscope Co., Red Bank, N. J.

See Advertisement on Page 180

Speer Electronics Co., Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80B


GENERATORS—Electronic Wave

Amplifier Corp. of America, 236 Broadway, New York 13, N. Y.

Electronic Engineering Co., Inc., Red Bank, N. J.

See Advertisement on Page 68

Feller Engineering Co., 804 Milwaukee Ave., Chicago 11, Ill.


Lektra Labs., Inc., 46-67 10th Ave., New York 18, N. Y.

Sheron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

See Advertisements on Pages 80A, 80B

Westerheide Corp., 77 24th St., New York 10, N. Y.

GENERATORS—Gas-Engine Driven

Carson Machine & Supply Co., Box 4547, Oakland City 9, Ohio.


Continental Electric Co., Inc., 323-327 Ferry St., Newark 5, N. J.

Cyclohm Motor Corp., 5-17 46 Rd., L. I., N. Y.

Delco Appliance Div., General Motors Corp., Rochester, N. Y.

Electric Auto-Lite Co., The Toledo 1, Ohio.


Electric Indicators, Inc., 511 South St., Stamford, Conn.

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 96B, 96C

Homelite Corp., Port Chester, N. Y.

Kohler Co., Kohler, Wisc.


Master Vibrator Co., 300 Davis Ave., Dayton, Ohio.

Mideo Mfg. & Distributing Co., 1215 12th St., Waco, Texas.

Onan & Sons, D. W., 1264 Royalton Ave., North Bergen, N. J.


Pioneer Gen-E-Motor Corp. 5841 W. Dickens Ave., Chicago 33, Ill.

Real Electric Ind., 11351 Freud Ave., Detroit 14, Mich.

Universal Motor Co., 185 Harrison St., Oak- lish, Wis.


See Advertisement on Page 192

Monarch Electric Co., 1915 Fremont St., So. Pasadena, Calif.

Television Engineering Co., 7446 West Irving Park Road, Chicago 34, Ill.

GENERATORS—Induction and Dielectric Heating


Bondix Aviation Corp., Inc., Milwaukee 5, Wisc.

Bondix Aviation Corp., Red Bank, N. J.

See Advertisement on Page 216

Bud Co., 323-327 Ferry St., Newark 5, N. J.

Burke Electric Co., 12th & Cranberry Sts., Newark 2, N. J.

Carter Motor Co., 2644 N. Maplewood Ave., Chicago 47, Ill.

Century Electric Co., 1806 Pine St., St. Louis, Mo.


Continental Electric Co., Inc., 225 Ferry St., Newark 5, N. J.


Cyclohm Motor Corp. 5-17 46 Rd., L. I., N. Y.

Delco Appliance Div., General Motors Corp., Indianapolis 5, Ind.

Delco Appliance Div., General Motors Corp., Indianapolis 5, Ind.

See Advertisement on Page 219

Electro Auto-Lite Co., The Toledo 1, Ohio.


Electric Specialty Co., 211 South St., Stamford, Conn.


Gaston Power Tools, 2659 W. 95th St., Chicago 50, Ill.

General Aviation Equipment Co., Inc., Los Angeles 56, Calif.

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 96B, 96C

Geo-Nuclear Equipment Co., Key Bldg. & N. Rest St., Arlington, Va.

Great Lakes Electric Mfg. Co., 17 S. Desplains St., Chicago 6, Ill.

Hertner Electric Co., 1252 Cranston Ave., Cleveland 11, Ohio.

Holiday Ind., 355 W. Monroe St., Chicago 6, Ill.

Kato Engineering Co., 530 N. Front St., Mankato, Minn.

Kollman Instrument Div. of Square D Co., 98-98 43rd Ave., Elmhurst, N. Y.

See Advertisement on Page 46

Leland Electric Co., 1591 Webster St., Dayton, Ohio.

Master Motor Co., 200 Davis Ave., Dayton 1, Ohio.

Onan & Sons, D. W., 3264 Royalton Ave., Minneapolis 5, Minn.


Studebaker Electric Motors, 200 Bloomfield Ave., Bloomfield, N. J.

Superior Electric Co., 83 Laurel St., Bristol, Conn.

See Advertisements on Pages 5 to 16

Winchester Electric Corp., Motor Div., Buffalo, N. Y.

Wolfsen Corp., 7th & Division Sts., Sioux City, Iowa

GENERATORS—Pulse

American Radio Co., 611 E. Garfield Ave., Glendale, Calif.


Chalmette Electronics, 475 Washington St., Boston 2, N. J.

See Advertisement on Page 241


See Advertisement on Pages 96B, 96C


See Advertisements on Pages 94, 95

Industrial Instruments Co., 317 E. 55th St., New York 17, N. Y.

Radar Engineers, 4004 Arcade Bidg., Seattle 1, Wash.

Remington Rand, Electronics Div., Middle- town, Conn.


Rowe Radio Research Lab., 2422 N. Pulaski Road, Chicago 33, Ill.

Shain Electric Co., 1201 Flushing Ave., Brooklyn 6, N. Y.


See Advertisement on Page 76

Westinghouse Electric Corp., Motor Div., Buffalo, N. Y.

Rockwell, N. C., 1713 Kalamoras Rd., N.-W, Washington 9, D. C.

GENERATORS—Square Wave

American Radio Corp., 111 E. Garfield Ave., Glendale, Calif.

DeMornay-Bury, Inc., 475 Grand Concourse, The Bronx 1, N. Y.

See Advertisement on Page 171

Development Engineering Co., Inc., The, 1815 Ashland St., Houston 3, Texas.

Electric Indicators Co., 2451 Finley St., St. Louis 6, Mo.

Electro-Dynamics Div., Motor Div., 2655 W. 19th St., Chicago 8, Ill.


See Advertisement on Page 68

Espy Radio and Electronic Corp., 1218 Lincoln Ave., Santa Monica, Calif.

See Advertisement on Page 186


General Electric Co., Syracuse, N. Y.

See Advertisements on Pages 96A, 96B

Hi-Fidelity Electronics Corp., 1775 Broadway, New York 19, N. Y.


See Advertisements on Pages 94, 95

Measurement Engineering Ltd., 61 Duke St., Toronto, Ont.

Motor Co., Bloomfield, N. J.

See Advertisement on Page 193

Measurements Corp., Bloomington, New Jersey 11, N. J.

See Advertisement on Page 56

Reliner Electronics Co., 153 West 24th St, - New York 1, N. Y.

Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 5, N. Y.

Spray-Glycose Co., Inc. Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80B


GENERATORS—Ultrasound

Electronic Apparatus, Inc., 347 Madison Ave., New York 17, N. Y.

D-43
HEADDERS & HEADSETS

Perronoflux Corp., 4900 W. Grand, Chicago, Ill.
New York Transformer Co., 120 Greenwich St., New York, N. Y.
American Phenolic Corp., 1697 First Ave., New York City, N. Y.
Magnetic Products Corp., The, Newark, N. J.

HEADS—Recording

Allied Recording Products Co., 21-00 43rd Ave., Long Island City, N. Y.
See Advertisement on Page 233
Brush Development Co., 2405 Perkins Ave., Cleveland 14, Ohio
Caltron Co., 1191 W. Pico Blvd., Los Angeles, Calif.
Duotone Co., 799 Broadway, New York 3, N. Y.
Fairchild Camera & Instrument Corp. 88-10 W. Wyck Blvd., Jamaica 1, N. Y.
Miles Reproducer Co., Inc., 121 Broadway, New York 12, N. Y.
Ortho-Kut Co., 146 Grand St., New York 6, N. Y.
Shure Brothers, 225 W. Huron St., Chicago, Ill.
West B, Electrical Co., Inc., 195 Broadway, New York 7, N. Y.

HEARING AID CONNECTORS

Alden Products Co., 117 No. Main St., Bridgeport, Conn.
American Phenolex Corp., 1828 S. 54th Ave., Chicago 30, Ill.
Paraphone Hearing Aid, Inc., 2056 E. 44th St., Cleveland 15, Ohio

HEARING AID METERS


HEARING AID MICROPHONES

Astatic Corp., Conneaut, Ohio
Brush Development Co., The, 2405 Perkins Ave., Cleveland 14, Ohio
Paraphone Hearing Aid Inc., 2056 E. 44th St., Cleveland 15, Ohio
Perfonoflux Corp., 4900 W. Grand Ave., Chicago, Ill.

HEARING AID RECEIVERS

American Earphone Co., 10 E. 43rd St., New York, N. Y.
Brush Development Co., 2405 Perkins Ave., Cleveland 14, Ohio

HEARING AID TRANSFORMERS

Chicago Transformer Div., Essex Wire & Cable Corp., Chicago 13, Ill.
Control Corp., 721 Central Ave., Minneapolis 14, Minn.
Paraphone Hearing Aid Inc., 2056 E. 44th St., Cleveland 15, Ohio
Perfonoflux Corp., 4900 W. Grand Ave., Chicago, Ill.
ELECTRONIC and ALLIED PRODUCTS

Electronic and Allied Products Co., 12-15-17, N. Virginia Ave., Atlantic City, N. J.
Electronic Components, 85 So. Washington Ave.,
Bergenfield, New Jersey.

INDICATORS—Ultrasonic Depth

National-Simplex-Blaw-Knox, Inc.,
Div., 2500 S. Cote St., Chicago 7, N. Y.
Submarine Signal Co., Affiliated with Ray-
theon Mfg. Co., 2901 E. Tenth St., St. Louis 7, Mo.
Televised Products Inc., 7468 West Irving Park Road, Chicago 34, Ill.

INDICATORS—Volume

Amplifier Corp. of America, 286 Broadway, New York, N. Y.
Audio Products Co., 2101 W. Olive Ave.,
Burbank, Calif.
Collins Audio Products Co., 126 Park St.,
Westfield, N. J.
See Advertisement on Page 293
Davidson, 981 Central Ave., Newark 4, N. J.
Electronic Development Co., 4420 N. 23rd St.,
Omaha 11, Nebraska
Electrical Co., Schenectady 5, N. Y.
General Electric Co., 191 Central Ave., Newark
Hathaway Instrument Co., 1315 S. Clark-
son St., Denver 10, Colo.
Sound Apparatus Co., 233 Broadway, New
York 7, N. Y.
See Advertisement on Page 228
Tagalong Instruments Co., 29 Allyn St.,
New York 14, N. Y.
Western Electric Co., 190 Broadway,
New York 7, N. Y.
Zernicke & Co., 25 Park Row, New
York 3, N. Y.

INSTRUMENTS—Electronic Musical

Aerolux Corp., 453 11th Ave., New
York 14, N. Y.
Connecticut Co., 29 Allyn St.,
New York 14, N. Y.
Crystal Research Labs., Inc., 29 Allyn St.,
New York 14, N. Y.
Electronic Instrument Co., 29 Allyn St.,
New York 14, N. Y.
Electro-Optical Div., 2500 S. Cote St.,
Chicago 7, Ill.
Lektra Labs., 2500 S. Cote St.,
Chicago 7, Ill.
Ripley Co., Torrington, Conn.
Valco Mfg. Co., 4700 W. Walton St., Chi-
ago 34, Ill.
Westall Electrical Instrument Co., Newark
5, N. J.

INSTRUMENTS—Graphic Recording

Bruce Development Co., The, 3405 Perkins Ave.,
Cleveland 14, Ohio
Electric Tachometer Corp., Broad & Spring
Garage St., Philadelphia, Pa.
Esoterica-Angus Co., Inc., P. O. Box 597,
Indianapolis, Ind.
Foxboro Co., Foxboro, Mass.
Giannini & Co. Inc., G. M. Autolight In-
struments Div., 2500 S. Cote St.,
Chicago 7, Ill.
Hathaway Instrument Co., 1315 S. Clark-
son St., Denver 10, Colo.
See Advertisement on Page 288
Tagalong Instruments Co., 29 Allyn St.,
New York 14, N. Y.
Western Electric Co., 190 Broadway,
New York 7, N. Y.
Zernicke & Co., 25 Park Row, New
York 3, N. Y.

INSTRUMENTS—Ultrasonic

Branam Instruments, Inc., Joe's Hill Rd.,
Danbury, Conn.
Brush Development Co., 3405 Perkins Ave.,
Cleveland, Ohio
Crystal Research Labs., Inc., 29 Allyn St.,
New York 14, N. Y.
National-Simplex-Blaw-Knox, Inc.,
Div., 190 Broadway, New
York 7, N. Y.
Racoon Electric Co., 32 E. 10th St., New
York 3, N. Y.
See Advertisement on Page 213
Berry Products Co., 15th & Willow Ave.,
Holoken, N. J.
Submarine Signal Co., Affiliated with Ray-

ILLUMINATION CONTROLS

See Controls, Lighting

INDUCTION HEATING

See Heating, Induction

INFRARED DRYING OVENS

See Ovens

INSULATION PARTS—Precision

American Electro Metal Corp., 20 Yonkers
Ave., Yonkers, N. Y.
Assay Products Inc., Charing Fails,
Ohio
Boehnke Inc., H. O., 915 Broadway,
New York, N. Y.
Development Engineering Co., Inc., The,
1318 Ashland St., Houston 8, Texas
Diamond Instrument Co., North Ave.,
Waukegan, Ill.
Do-All Co., 1301 Washington Ave., S.
Minneapolis 4, Minn.
Electric Tachometer Corp., Broad & Spring
Garage St., Philadelphia, Pa.
Foote, Pierson & Co., Inc., 75 Hudson St.,
New York 7, N. Y.
Hathaway Instrument Co., 1315 S. Clarkson
St., Denver 10, Colo.
Instruments Corp., Oakington, N. Y.
See Advertisement on Page 253
See Advertisement on Page 255
Nelson Electrical Lab., 153 Lafayette St.,
New York 14, N. Y.
Precision Tool Co., 925 Terrace St., Phila-
adelphia 28, Pa.
See Advertisement on Page 218
Robinson & Co., 202 Fair Oaks Ave.,
South Pasadena, Calif.
Technology Instrument Corp., 1058 Main St.,
Waltham, Mass.
Van Den Hout Electronics Inc., Tarzana, Calif.
Western Electrical Instrument Co., 618 Fre-
linghuysen Ave., Newark 5, N. J.
Weymouth Instrument Co., 1440 Commercial
St., East Weymouth, Mass.
Whitcomb Corp., The, 9 Liberty St., Newark
5, N. J.

INSULATING COMPASSES

American Phenolic Corp., 1830 S. 54th Ave.,
Chicago 69, Ill.
See Advertisement on Page 23
American Products Mfg. Co., Osleander &
Dublin St., St. Louis 7, Mo.
General Electric Mfg. Co., 919 Taylor Ave-
sue, Rockford, Ill.
See Advertisement on Page 90
General Electric Co., Chemical Dept.,
Insulating Fibers, Pittsfield, Mass.
See Advertisement on Page 97
Haynes Labs., Inc., G. W. Chandler St.,
Springfield, Mass.
Ins-X Corp. Inc., The, 1976 Meeker Ave.,
Brooklyn 32, N. Y.
International Instruments, Inc., Broadway,
New York 2, N. Y.

Insulation Mfrs. Corp., 505 W. Washington
Blvd., Chicago 7, Ill.
see Advertisement on Page 186

Improving Compounds

Acme Wire Co., New Haven 14, Conn.
American Phenolic Co., 200 Madison Ave.,
New York 10, N. Y.
Bakelite Corp., 3415 Howard St., Skokie, Ill.
Canolix Corp., 211 N. Washington St.,
Bloomington, Ind.
Delphi Co., John C., 183 Emmett St., New-
ark, N. J.
General Cement Mfg. Co., 919 Taylor Ave.,
Rockford, Ill.
See Advertisement on Page 90
George E. D., 6200 N. 2nd St., St.
Louis, Mo.
Haliewa Products Div. Unicarbide & Car-
bon Corp., 30 E. 43rd St., New
York 17, N. Y.
Insulation Mfrs. Corp., 505 W. Washington
Blvd., Chicago 7, Ill.
See Advertisement on Page 87
Irvington Varnish & Insulator Co., 10 Ar-
ton Ter., Irvington 11, N. J.
See Advertisement on Pages 20, 21
Mica Insulator, Co., Schenectady 1, N. Y.
Mitchell Rand Insulation Co., Inc., 2 Mor-
ton St., New York 7, N. Y.
See Advertisement on Page 73
Standard Varnish Works, Terr., Staten Island 3, N.
Stevenson Bros. & Co., 110 Race Street, New
ark, N. J.
Trotter & Co., Inc., 581 Johnson Ave.,
Brooklyn 8, N. Y.
Zophar Mills Inc., 112-130 26th St., Brook-
lyn 32, N. Y.
See Advertisement on Page 190

Insulating Varnish

Acme Wire Co., New Haven 14, Conn.
American Phenolic Chemical Co., 184 Foster
St., Providence, Mass.
Arco Co., 7301 Bessemer Ave., Cleveland 4,
Ohio
Bakelite Corp., 300 Madison Ave., New
York 10, N. Y.
Communication Products Co., Inc., Broad-
way & Clark, Chicago 7, Ill.
John C., 183 Emmett St., Newark 5,
N. J.
Dow Corning Corp. Midland, Mich.
du Pont de Nemours & Co., James,
150 Exchange St., Boston, Mass.
General Cement Mfg. Co., Beverly
Hills, Calif.

INSULATING PRODUCTS

American Phenolic Corp., 1830 S. 54th Ave.,
Chicago 69, Ill.
See Advertisement on Page 23
American Products Mfg. Co., Osleander &
Dublin St., St. Louis 7, Mo.
General Electric Mfg. Co., 919 Taylor Ave-
sue, Rockford, Ill.
See Advertisement on Page 90
General Electric Co., Chemical Dept.,
Insulating Fibers, Pittsfield, Mass.
See Advertisement on Page 97
George E. D., 6200 N. 2nd St., St.
Louis, Mo.
Hercules Coal Co., Manitoowoc, Wis.
Bakelite, Inc., 10 Ar-
ton Ter., Irvington 11, N. J.
Mica Insulator, Co., Schenectady 1, N. Y.
Mitchell Rand Insulation Co., Inc., 2 Mor-
ton St., New York 7, N. Y.
Standard Varnish Works, Terr., Staten Island 3, N.
Stevenson Bros. & Co., 110 Race Street, New
ark, N. J.
Zophar Mills Inc., 112-130 26th St., Brook-
lyn 32, N. Y.
See Advertisement on Page 190
INSULATION PARTS

American Lava Corp., Chattanooga 5, Tenn.

American Phenolic Corp., 1830 S. 54th Ave., Chicago 30, Ill.


Aerofoil Co., 11 New York Ave., Pitman, N. J.

Aeromatics Corp., 109 New York Ave., Pitman, N. J.

Aep Industries, Inc., 121 Beach St., Boston 10, Mass.

Aeronautics, Inc., 2900 Griswold St., Detroit 2, Mich.

Aeronautics, Inc., 1830 S. 54th Ave., Chicago 30, Ill.

American Aircraft Corp., 51 Ninth St., N.Y.C.


American Atlas Corp., 69 Wooster St., New York 13, N. Y.

American Insulating Co., 410 Madison Ave., New York 17, N. Y.

American Insulating Co., 51 Murray St., New York 12, N. Y.

American Insulating Co., 121 Beach St., Boston 10, Mass.

American Insulating Co., 1426 General Ceramics & Steatite, New York 16, N. Y.

American Lava Corp., 150 Exchange St., Rochester, N. Y.

American Lava Corp., 250 Exchange St., Rochester, N. Y.

American Mfg. Co., 150 Exchange St., Rochester, N. Y.

American Mortar & Insulation Co., 2200 South Main St., Toledo 14, Ohio


American Phenolic Corp., 51 Murray St., New York 12, N. Y.

American Phenolic Corp., 1190 Park Ave., New York 33, N. Y.

American Phenolic Corp., 51 Murray St., New York 12, N. Y.

Amphenol Corp., 2900 Griswold St., Detroit 2, Mich.

Amphenol Corp., 121 Beach St., Boston 10, Mass.

Amphenol Corp., 51 Murray St., New York 12, N. Y.

Amphenol Corp., 1190 Park Ave., New York 33, N. Y.

Amphenol Corp., 121 Beach St., Boston 10, Mass.

Amphenol Corp., 51 Murray St., New York 12, N. Y.

Amphenol Corp., 1190 Park Ave., New York 33, N. Y.

Amphenol Corp., 121 Beach St., Boston 10, Mass.

Amphenol Corp., 51 Murray St., New York 12, N. Y.

Amphenol Corp., 1190 Park Ave., New York 33, N. Y.

American Radio Corp., 2900 Griswold St., Detroit 2, Mich.

American Radio Corp., 51 Murray St., New York 12, N. Y.

American Radio Corp., 1190 Park Ave., New York 33, N. Y.

American Radio Corp., 51 Murray St., New York 12, N. Y.

American Radio Corp., 1190 Park Ave., New York 33, N. Y.

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American Radio Corp., 1190 Park Ave., New York 33, N. Y.

American Radio Corp., 51 Murray St., New York 12, N. Y.

American Radio Corp., 1190 Park Ave., New York 33, N. Y.

American Radio Corp., 51 Murray St., New York 12, N. Y.
GENERAL CEMENT MFG. CO., 919 Taylor Ave., Rockford, Ill.

HUSE LIBERTY MICA CO., 171 Camden St., Malden, Mass.


INSULATION MRS. CORP., 565 W. Washington Blvd., Chicago 6, Ill., and 122 Greene St., New York 13, N. Y.

INSULINES, Corp. of America, 36-02 35th Ave., Long Island City, N. Y.

INSULINE CORP. OF AMERICA, 36-02 35th Ave., Malden, Mass.

INSULINE CORP. OF AMERICA, 1425 37th St., Chicago 16, Ill.

INNOVIA CHEMICAL DEPT., 520 Farrell St., Pittsburgh, Pa.

INSULATORS—ALEXANDER, Inc., 130 W. Washington St., 1051 Prospect St., and 401 Prospect St., Chicago 47, Ill.

INSULATORS—AMARIL, Inc., 125 E. 25th St., New York 17, N. Y.

INSULATORS—AMERICAN LAVAL CORP., Chattanooga 5, Tenn.

INSULATORS—AMERICAN LAVAL CORP., 150 E. 25th St., New York 14, N. Y.

INSULATORS—AMERICAN PHENOLIC CORP., 1830 S. 54th Ave., Chicago 39, Ill.

INSULATORS—ANCHOR, Inc., 108 Park Row, New York 7, N. Y.

INSULATORS—ANHYDROUS, Inc., 1917 N. Keasbey, N. J.

INSULATORS—APPLIANCES MFG. CO., 535 Fifth Ave., New York 18, N. Y.

INSULATORS—ARMADIO, Inc., 501 Prospect St., Chicago 47, Ill.

INSULATORS—ARMARIO, Inc., 901 Park Row, New York 13, N. Y.

INSULATORS—ARTHUR, Inc., 122 Greene St., New York 13, N. Y.

INSULATORS—ASSOCIATED COMPANIES, 122 Greene St., New York 13, N. Y.

INSULATORS—ASSOCIATED COMPANIES, 122 Greene St., New York 13, N. Y.

INSULATORS—ASSOCIATED COMPANIES, 122 Greene St., New York 13, N. Y.

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INSULATORS—ASSOCIATED COMPANIES, 122 Greene St., New York 13, N. Y.

INSULATORS—ASSOCIATED COMPANIES, 122 Greene St., New York 13, N. Y.
ELECTRONICS and ALLIED PRODUCTS

IRON—Electric Soldering
See Advertisement on Page 26
Baldwin Manufacturing Co., 441 W. Van Buren St., Chicago 44, Ill.
Drake Electric Works, 3534 Lincoln Ave., Chicago 19, Ill.
See Advertisement on Page 26
Dual-Electric, 244 So. Broadway, Los Angeles 13, Calif.
Eister Engineering Co., Inc., 748 S. 13th St., Newark 3, N. J.
Electric Soldering Iron Co., 1935 W. Elm St., Deep River, Conn.
General Electric Co., Schenectady 5, N. Y.
Hexagon Electric Company, 161 W. Clay Ave., Roselle Park, N. J.
Insuline Corp. of America, 36-02 35th Ave., Chicago 44, Ill.
See Advertisement on Page 166
Kellogg Switchboard & Supply Co., 215 Kearny St., San Francisco 2, Calif.
Telephonics Corp., 350 West 31st St., New York 1, N. Y.
Vibroplex Co., Inc., 833 Broadway, New York 12, N. Y.
Winstone Co., 6 Liberty St., Newark 5, N. J.

KILOVOLTAMETERS
Assembly Products, Inc., Chagrin Falls, Ohio
See Advertisement on Page 42
Electronic Development Co., 1420 N. 33rd St., Chicago 17, Ill.
Electronic Measurements Co., Red Bank, N. J.
See Advertisement on Page 24
Johnson Co., E. F., Waseca, Minn.
Kehor Mfg. Co., 701 Kearny St., San Francisco 9, Calif.
Kwikheater Div., Sound Equipment Corp., 3953 San Fernando Road, Glendale 4, Calif.
Lenk Mfg. Co., Newton Lower Falls 63, New York 17, N. Y.
Luma Electrical Equipment Co., P. O. Box 122, Toledo, Ohio
Mat-Pro Tool Co., 123 Sussex Ave., Newark 4, N. J.
See Advertisement on Page 24
Sound Equipment Corp. of California, 3903 S. Flores Avenue Rd., Glendale 4, Calif.
Ungar Electric Tools, Inc., 615 Ducommun Ave., Chicago 18, Ill.
Vulcan Electric Co., 88 Holten St., Danvers, Mass.
W. J. Willard Co., A. H., 64 Park Pl., New York 7, N. Y.
Western Electric Co., 516 Northampton St., Easton, Pa.

ISOLATION COUPLER—f-m Antenna
Andrew Co., 283 E. 76th St., Chicago 19, Ill.
Johnson Co., K. P., Waseca, Minn.

ISOTOPES—Radioactive
Isotope Section, Research Div., Manhattan Engineer District, P. O. Box E, Oak Ridge, Tenn.
Tracerlab, Inc., 65 Oliver St., Boston 10, Mass.

JACKS
See Plugs and Jacks

JUMPERS—Bonding
Aeronautical Radio Mfg. Co., 156 First St., Mineola, N. Y.
American & Wire Co., U. S. Steel Corp. Subs., Rockefeller Bldg., Cleveland 3, Ohio.
Rattigan-McClain, Inc., P. O. Box 1745, New Haven 7, Conn.

KEYERS & COUPLERS
Aero Communications, Inc., 221 Main St., East Orange, N. J.
American Phenolle Corp., 1830 S. 54th Ave., Chicago 30, Ill.
See Advertisement on Page 32
Bohme Inc., H. O., 915 Broadway, New York, N. Y.
Ercie Radio Labs, Inc., Fenimore Ave., Hempstead, N. Y.
Hempstead, N. Y.
Preble Electric Mfg. Corp., 1475 Broadway, New York City 18, N. Y.
Schultz & Sheets, Inc., 303 Kearny St., N. E., Washington 11, D. C.

KEYS & CODING EQUIPMENT
Aero Communications, Inc., 331 Main St., Hempstead, N. Y.
Allen Products Co., 177 N. Main St., Brockton, Mass.
Bohme Inc., H. O., 915 Broadway, New York, N. Y.
Ercie Radio Labs, Inc., Fenimore Ave., Hempstead, N. Y.
Preble Electric Mfg. Corp., 1475 Broadway, New York City 18, N. Y.
Schultz & Sheets, Inc., 303 Kearny St., N. E., Washington 11, D. C.

LAMINATIONS

KNOW—Wooden
Birnbaum Radio Co., Inc., 145 Hudson St., New York, N. Y.
Booan Mfg. Co., 130 W. 25th St., New York, N. Y.
Booan Mfg. Co., 130 W. 25th St., New York, N. Y.
Birnbaum Radio Co., Inc., 145 Hudson St., New York, N. Y.
Booan Mfg. Co., 130 W. 25th St., New York, N. Y.

LACQUER—Insulating Compounds

LAMINATIONS—Transformer
Kellogg Switchboard & Supply Co., 6650 V. S. Clearview Ave., Detroit 2, Mich.
Koppers Magnetics Corp. The, Norwalk, Ohio
See Advertisement on Page 78
Ovens-Illinois Glass Co., Plastics Div., Toledo, Ohio
Plastic Enterprises, 129 Bloomfield Ave., Bloomfield, N. J.
Radio Corp. of America, RCA Victor Div., Camden, N. J.
See Advertisements on Inside Back Cover & Back Cover, 231
Reiner Electric Co., 125 W. 25th St., New York, N. Y.
Richardson Mfg. Co., 700 Colgate Park, Ill.
See Advertisement on Page 209
See Advertisement on Page 164
Standard Molding Corp., Dayton, Ohio
Stokes Molds, Taylor St. at Tremont Ave., Chicago 3, Ill.
U. S. Instrument Corp., 1511 South Harrison St., East Orange, N. J.
See Advertisement on Page 255
U. S. Plastics Corp., 3335-35 Irving Park Rd., Chicago, N. Y.
Victory Mfg. Co., 1722 Ward Ave., Chi-
Waterbury Companies, Inc., Waterbury 90, Conn.
Wilmington Fibre Specialty Co., P. O. Drawer 1012, Wilmington 99, Del.

KNOWS—Plastic Molded
Alden Products Co., 117 No. Main St., Brockton, Mass.
Beach Mfg. Co., 222 East Beach Ave., Inglewood, Calif.
See Advertisement on Page 76
Birnbaum Radio Co., Inc., 145 Hudson St., New York, N. Y.
Bud Radio Inc., 2118 W. 55th St., Cleveland 3, Ohio.
Chicago Die Mold Corp., 4019 Wright Ave., Chicago 33, Ill.
Consolidated Wire & Associated Companies, 1625 S. Clinton St., Chicago 16, Ill.
Crossman, Inc., 3791 Eramond Ave., Chicago 39, Ill.
Davidson Molding Co., 1428 N. Wells St., Chicago 10, Ill.
Dimec Plastics, Inc., 921 Mississauga Ave., Rochester 5, N. Y.
Exar Resistor Corp., 644 W. 114th St., Erie, Pa.
See Advertisement on Page 47
Firestone Tire & Rubber Co., 1 Firestone Ave., Wall River, Mass.
General Cement Mfg. Co., 919 Taylor Ave., Rockford, III.
See Advertisement on Page 90
General Electric Co., Syracuse, N. Y.
See Advertisements on Pages 90, 96A.
Gordon Specialties Co., 823 S. Wabash Ave., Chicago 11, Ill.
Grammes & Sons Inc., L. F., 389 Union St., Syracuse 3, N. Y.

LAMINATIONS

LENARD—Allied
Lenard Electric Co., 8500 S. Cicero Ave., Chicago 38, Ill.

LAMINATIONS—Plastics

Lenmar Specialties Co., 823 S. Wabash Ave., Chicago 14, Ill.
Mayfair Molding Products Corp., 4440 N. E. 24th Ave., Portland 8, Ore.
Molded Insulation Co., Aircraft Control Div., Standard Molding Corp., Dayton, Ohio
Midwest Molding & Mfg. Co., 319 N. Whipple St., Chicago 7, Ill.
Midwest Molding & Mfg. Co., 319 N. Whipple St., Chicago 7, Ill.
Mayfair Molding Products Corp., Aircraft Control Div., Standard Molding Corp., Dayton, Ohio
Midwest Molding & Mfg. Co., 319 N. Whipple St., Chicago 7, Ill.

LAMINATIONS—Sound Equipment

LAMINATIONS—Wire

LAMINATIONS—Standard
Lenmar Specialties Co., 823 S. Wabash Ave., Chicago 14, Ill.
Mayfair Molding Products Corp., 4440 N. E. 24th Ave., Portland 8, Ore.
Molded Insulation Co., Aircraft Control Div., Standard Molding Corp., Dayton, Ohio
Midwest Molding & Mfg. Co., 319 N. Whipple St., Chicago 7, Ill.
Midwest Molding & Mfg. Co., 319 N. Whipple St., Chicago 7, Ill.
Mayfair Molding Products Corp., Aircraft Control Div., Standard Molding Corp., Dayton, Ohio
Midwest Molding & Mfg. Co., 319 N. Whipple St., Chicago 7, Ill.

LAMINATIONS—Sound Equipment

LAMINATIONS—Wire

LAMINATIONS—Standard
Lenmar Specialties Co., 823 S. Wabash Ave., Chicago 14, Ill.
Mayfair Molding Products Corp., 4440 N. E. 24th Ave., Portland 8, Ore.
Molded Insulation Co., Aircraft Control Div., Standard Molding Corp., Dayton, Ohio
Midwest Molding & Mfg. Co., 319 N. Whipple St., Chicago 7, Ill.
Midwest Molding & Mfg. Co., 319 N. Whipple St., Chicago 7, Ill.
Mayfair Molding Products Corp., Aircraft Control Div., Standard Molding Corp., Dayton, Ohio
Midwest Molding & Mfg. Co., 319 N. Whipple St., Chicago 7, Ill.
LEADS —Test
Aerolite Electronic Hardware Corp., 24 Cliff St., Jersey City, N. J.
See Advertisement on Page 246
Dial Light Co. of America, Inc., 900 Broadway, New York, 3, N. Y.
See Advertisement on Page 166
See Advertisement on Page 45

LIGHTS —Photoelectric Source
Aerolux Light Corp., 653 11th Ave., New York 19, N. Y.
Dial Light Co. of America, Inc., 900 Broadway, New York 3, N. Y.
See Advertisement on Pages 158 to 161

LINKS —Antenna
American Phonemol Corp., 1830 S. 54th Ave., Chicago 30, Ill.
See Advertisement on Page 23

LITHIUM COMPOUNDS
See Metals

LOCATORS —Electronic Metal Locators & Detectors
Electronic Engineers, 1033-B Pacific St., Santa Monica, Calif.
Engineering Lab., Inc., 620 E. 4th St., Tulsa, Okla.
Fish & Research Lab., 1901 University Ave., Palo Alto, Calif.
General Electric Co., Schenectady 5, N. Y.
See Advertisements on Pages 96B, 96C
Malco Co. Inc., 25 N. 3rd St., Minneapolis, Minn.
Thomson Electrical Lab., Inc., 103 Lafayette St., New York 3, N. Y.
Radio Corp. of America, R.C.A Victor Div., Camden, N. J.
See Advertisements on Inside Back Cover & Back Cover, 251
See Advertisement on Page 44
See Advertisement on Page 78

LOCATORS —Power Line Failure
Deutschmann Corp., Tope, Elberate Div., Canton, Mass.
See Advertisement on Page 82
General Electric Co., 900 Broadway, New York 3, N. Y.
See Advertisements on Pages 96B, 96C
Jarvis, Kenneth W., 1140 Cherry St., Winnetka, Ill.
Rutten Co., 497 N. Jackson St., Jackson, Mich.
See Advertisement on Page 46

LOCKS —Dial
Bud Radio, Inc., 3118 S. 55th St., Cleveland, Ohio
General Radio Co., 100 Gold St., New York 7, N. Y.
Sylvania Electric Prod., 500 5th Ave., New York 19, N. Y.
See Advertisements on Pages 158 to 161

LOCKS —Shaft
See Advertisement on Page 44
See Advertisement on Page 78

LORAN NAVIGATIONAL DEVICES
Radio Corp. of America, RCA Victor Div., Camden, N. J.
See Advertisements on Inside Back Cover & Back Cover, 251
Radio Marine Corp. of America, 78 Varick St., New York 13, N. Y.
Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.
See Advertisement on Pages 504A, 508B

LOUDSPEAKER DRIVER UNITS
Altec Lansing Corp., 1161 N. Vine St., Hollywood 28, Calif.
ELECTRONIC and ALLIED PRODUCTS

MACHINES

Radio Corp. of America, RCA Victor Div.,
Camden, N. J.
See Advertisements on Inside Back Cover &
Back Cover, 23.

Remler Co., Inc., 45 8th St., San Fran-
disco 10, Calif.

Taylor Machine Works Co., 120 Greenwich St.,
New York 6, N. Y.

University Loudspeakers, Inc., 225 Varick
Street, New York 14, N. Y.

Webster Electric Co., 1900 Clark St., Ba-
wire, Wis.

Western Electric Co., Inc., 195 Broadway,
New York 7, N. Y.

See Advertisements on Pages 88, 89

LUGS AND TERMINALS

Aerolite Electronic Hardware Corp., 24 Clif
St., Greenwich Village, N. Y.

See Advertisement on Page 24.

Aircraft Materials, Inc., 1213 N. Fourth St., Harrisburg, Pa.

Amalgamated Radio Television Corp., 476,
New York 12, N. Y.

Audio Products Co., 2101 W. Olive Ave.,
Los Angeles 27, Calif.

Belden Mfg. Co., 4647 W. Van Buren St.,
Chicago 11, Ill.

Birnbach Radio Co., Inc., 145 Hudson St.,
New York 13, N. Y.

Cambridge Thermionic Corp., 445 Concord
Ave., Cambridge, Mass.

Cinf Mfg. Corp., 2355 W. Van Buren St.,
Chicago 11, Ill.

Dante Electric Mfg. Co., 575 Lexington
Ave., New York 22, N. Y.

Dempster Mfg. Co., 195 W. 54th St., New York 19, N. Y.

Edison Mfg. Co., 1523 S. Michigan Ave.,
Chicago 13, Ill.

Eby Mfg. Co., Inc., 18 W. Cheyton Ave.,
Philadelphia 13, Pa.

Electro-Medical Instrument Co., 812
Bennett Dr., Cheyton, Pa.

Federal Electric Products Co., Inc., 50 Paris
St., Newark, N. J.

Franklin Airloot Co., 43-24 30th St., Long
Island City, N. Y.

See Advertisement on Page 61.

General Cement Mfg. Co., 509 Taylor Ave.,
Rockford, Ill.

See Advertisement on Page 90.

General Electric Co., Schenectady 5, N. Y.

See Advertisement on Page 98.

Grumman Corp., Long Island City, N. Y.

See Advertisement on Page 9.

Inulline Corp. of America, 36-02 35th Ave.,
Long Island City, N. Y.

Inulline Corp. of America, 85-02 35th Ave.,
Queens, N. Y.

Johnson Co., Inc., 655 S. Wabash Ave.,
Chicago 3, Ill.

Keystone Electronics Co., 59-22 Franklin St.,
New York 11, N. Y.

Kolon Electric Mfg. Co., 123 N. J. Rail-
road Ave, Newark 5, N. J.

Kulka Electric Mfg. Co., 50 South St.,
Middletown, N. Y.

La Marna Mfg. Co., Inc., East Rutherford,
N. J.

Manufacturers Screw Products, 270 W. Hub-
rard Ave., Chicago 11, Ill.

Moore Co., Frank W., 1209 Soldiers Field,
Cambridge 21, Mass.

O. Z. Electrical Mfg. Co., 262 Bond St.,
New York 7, N. Y.

Patton-MacGoyer Co., 17 Virginia Ave.,
Providence 3, R. I.

Pent-Rich Corp., 315 State St., Erie, Pa.

Rapin H. Co., Brookline, N. Y.

Rusgreen Mfg. Co., 14262 Birrow Ave.,
Detroit, Mich.

Schott Co., Walter L., 3386 Santa Monica
Blvd., Los Angeles 10, Calif.

Sherman Mfg. Co., H. B., 22 Barney St.,
Battle Creek, Mich.

States Co., 19 New Park Ave., Hartford 5, Conn.

Stover Mfg. Co., 33-21 85th St., Jamaica,
Queens, N. Y.

Stinson Co., Inc., Edwin B., 74 Franklin
Ave., Brooklyn 4, N. Y.

Stronghold Wire Products, Inc., 216 West Hub-
rard St., Chicago 10, Ill.

Thomas & Betts Co., Inc., 26 Butler St.,
Elizabeth 1, N. J.

Thompson-Bremer & Co., 1640 W. Hubbard
Ave., Chicago 10, Ill.

United Screw & Bolt Corp., 2513 W. Culler-
ton St., Chicago 14, Ill.

Waterbury Company, Inc., Waterbury, Conn.

West Cost Electronics Co., 1601 S. Burling-
ton St., Los Angeles 6, Calif.

Zierl Mfg. Co., 346 Gerard Ave., New York,
N. Y.

MACHINES—Blueprint

Dietzgen Co., Eugene, 2425 Sheffield Ave.,
Chicago, Ill.

Paragon-Revolute Corp., 71 South Ave.,
Cincinnati, Ohio.

Pease Co., C. F., 2501 W. Irving Park Rd.,
Chicago, Ill.

Peck & Harvey, 5736-38 N. Western Ave.,
Chicago 44, Ill.

MACHINES—Carbon Filling for Micro-
phones

Tech Laboratories, 337 Central Ave., Jersey City,
N. J.

MACHINES—Crystal Disc Lopping &
Manufacturing

Commercial Equipment Co., 1116 McGee
St., Kansas City, Mo.

National Gasket & Washer Mfg. Co., 122 E.
25th St., New York 10, N. Y.

Simonds Machine Co., Inc., 246-48 Worces-
ter St., Southbridge, Mass.

Sparkite Tools, Inc., 2931-35 North Pulaski
Road, Chicago 41, Ill.

MACHINES—Crystal Manufacturing &
Finishing

Commercial Equipment Co., 1416 McGee St.,
Kansas City, Mo.

Simonds Machine Co., Inc., 246-48 Worces-
ter St., Southbridge, Mass.

MACHINES—Electric Soldering

Baker-Phillips Co., 3097 Lyndale Ave. So.,
Minneapolis 1, Minn.

Cole Radio Works, 86 Westville Ave, Cald-
wood, N. J.

Eisler Engineering Co., Inc. 740 S. 13th St.,
Norwalk 3, N. J.

Electro-Medical Instrument Co., 1545 W. Eim
St., Deep River, Conn.

Mulberry Products Co., 123 Sussex Ave.,
Newark 4, N. J.

See Advertisement on Page 246.

Searle Aerio Industries, Inc., Orange, Calif.

Torit Mfg. Co., Walnut & Exchange Sts.,
St. Paul 2, Minn.

MACHINES—Electronic Balancing

Amicus Co., B. R. 1101 N. Delaware St.,
Indianapolis, Ind.

Baldwin Locomotive Co., North Ave., Wake-
field Mass.

Globe Machine Co., 1245 E. Washington
Ave., Madison 2, Wis.

Spermite Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80B

MACHINES—Electronic Beverage
Inspection

Electronic Apparatus Inc., 347 Madison
Ave., New York 17, N. Y.

Radio Corp. of America, RCA Victor Div.,
Camden, N. J.

See Advertisements on Inside Back Cover &
Back Cover, 251.
### METAL PARTS - Trimmings

**Bailey Co.,** Inc. 21 Water St.,胺沼美市、
**Dahleron Metallic Door Co., Jamestown**, N. Y. 

**Dayton Agee Co.,** 930 York St., Cincinnati, Ohio

**Gramme's & Sons Inc.,** L. F., 389 Union St., Allentown 2, Pa.

**Haydu Bros.,** Plainfield, N. J.

**Kings Electronics Co.,** 372 Classon Ave., Brooklyn 5, N. Y.

**Kings Metal Shaping Co.,** 174 Centre St.

**La Magna Mfg. Co., Inc., East Rutherford, N. J.

**Lovell Switchboard & Supply Co.,** 856 S. Michigan Ave., Chicago 3, Ill.

**National Co.,** Inc. 61 Sherman St., New York 16, N. Y.

**National Co.,** Inc. 150 Nassau St., New York 7, N. Y.

**Alicon**

- Arnold Engineering Co., 157 E. Ottawa St., Chicago 7, Ill.

**Antimony**

- American Smelting and Refining Co., Federated Metals Div., 120 Broadway, New York 6, N. Y.

**Arsenic**

- Belmort Smelting & Refining Wks., Inc. 330 Belmont Ave., Brooklyn 7, N. Y.
- Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.

**Barium**

- King Laboratory Inc., 127 Solar St., Syracuse, N. Y.

**Brass and Bronze**

- American Smelting and Refining Co., Federated Metals Div., 120 Broadway, New York 6, N. Y.
- Belmort Smelting & Refining Wks., Inc. 330 Belmont Ave., Brooklyn 7, N. Y.
- Chase Brass & Copper Co., Inc., Watertown, Conn.
- La Magna Mfg. Co., Inc., East Rutherford, N. J.
- Revere Copper & Brass Inc., 230 Park Ave., New York 7, N. Y.
- Riverside Metal Co., Riverside, N. J.

**Cadmium**

- American Smelting and Refining Co., Federated Metals Div., 120 Broadway, New York 6, N. Y.
- Belmort Smelting & Refining Wks., Inc. 330 Belmont Ave., Brooklyn 7, N. Y.
- Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.

**Cesium Compounds**


**Chromium**

- Belmort Smelting & Refining Wks., Inc. 330 Belmont Ave., Brooklyn 7, N. Y.
- Electro Metallurgical Co., Unit of Union Carbide & Carbon Corp., 50 E. 42nd St., New York 17, N. Y.

**Coefficient Metals**

- Carpenter Steel Co., Reading, Pa.
- Magnetic Metals Co., Camden, N. J.

**Columbus**


**Copper**

- Aluminum Wire Corp., 50 Howard St., New York, N. Y.
- American Smelting and Refining Co., Federated Metals Div., 120 Broadway, New York 6, N. Y.
- Baker & Co., 113 Astor St., Newark 5, N. J.
- Belmort Smelting & Refining Wks., Inc. 330 Belmont Ave., Brooklyn 7, N. Y.
- Chase Brass & Copper Co., Inc., Watertown, Conn.
- Revere Copper & Brass Inc., 230 Park Ave., New York 7, N. Y.
- Riverside Metal Co., Riverside, N. J.

**Foil-Aluminum, Tin & Lead**

- American Smelting and Refining Co., Federated Metals Div., 120 Broadway, New York 6, N. Y.

**Gold and Gold Alloys**

- American Platinum Works, N. J. R. R. Ave. at Oliver St., Newark 5, N. J.

**Jerrilium and Berrilium Alloys**

- Belmort Smelting & Refining Wks., Inc. 330 Belmont Ave., Brooklyn 7, N. Y.
- Brush Berrilium Co., The 3714 Chester Ave., Westville, N. J.
- Riversiide Metal Co., Riverside, N. J.
- Wilson Co., H. A., 97 Chestnut St., Newark, N. J.

**Metallograph**

- American Smelting and Refining Co., Federated Metals Div., 120 Broadway, New York 6, N. Y.
- Belmort Smelting & Refining Wks., Inc. 330 Belmont Ave., Brooklyn 7, N. Y.
- Chase Brass & Copper Co., Inc., Watertown, Conn.
- La Magna Mfg. Co., Inc., East Rutherford, N. J.
- Revere Copper & Brass Inc., 230 Park Ave., New York 7, N. Y.
- Riverside Metal Co., Riverside, N. J.
- Chrome Steel Mills Div., Ohio Industries, Inc., East Alton, Ill.

**Kings Electronics Co.**

- 372 Classon Ave., Brooklyn 5, N. Y.

**Kings Metal Shaping Co.**

- 174 Centre St.

**La Magna Mfg. Co., Inc.**

- East Rutherford, N. J.

**Lovell Switchboard & Supply Co.**

- 856 S. Michigan Ave., Chicago 3, Ill.

**National Co.**

- 61 Sherman St., New York 16, N. Y.
- 150 Nassau St., New York 7, N. Y.

**Alicon**

- Arnold Engineering Co., 147 E. Ontario St., Chicago 7, Ill.

**Antimony**

- American Smelting and Refining Co., Federated Metals Div., 120 Broadway, New York 6, N. Y.

**Arsenic**

- Belmort Smelting & Refining Wks., Inc. 330 Belmont Ave., Brooklyn 7, N. Y.
- Division Lead Co., 836 W. Kinzie St., Chicago 22, Ill.

**Barium**

- King Laboratory Inc., 127 Solar St., Syracuse 4, N. Y.
Pyrometer Instrument Co., Minneapolis
Honeywell Regulator Co., 2753 MB Instruments, Inc., 1060 State St., New
Foxboro Co., Foxboro, Mass.

Field Brown Instrument Co., 4428 Wayne Ave., Cleveland 15, Ohio
Bristol Co., The, Waterbury 91, Conn.

Bird Electronic

Bailey Meter Co., 1044 Ivanhoe Rd., Cleve-

lantoic Electric Instrument Co., Inc., 190 Broadway, New York 7, N. Y.

General Electric Co., Syracuse, N. Y.

Pan American Electric Co., 618 Frelinghuysen Ave., Newark 5, N. J.

See Advertisement on Pages 228

Sound Apparatus Co., 233 Broadway, New York 7, N. Y.

See Advertisements on Pages 88, 89

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 85, 86

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 228

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 88, 89

American Radio Co., 611 E. Garfield Ave., Glendale, Calif.

Boonton Radio Corp., Boonton, N. J.

See Advertisement on Page 295

Electronic Prods. Labs., 549 W. Randolph St., Chicago 6, Ill.

See Advertisement on Page 68

Freed Transformer Co., 72 Spring St., New York 12, N. Y.

See Advertisement on Page 255

General Electric Co., Syracuse, N. Y.

See Advertisements on Pages 96, 96A

Pan American Electric Co., Inc., 2912 Atlantic Ave., Brooklyn 7, N. Y.

See Advertisement on Page 227

General Electric Co., Schenectady 5, N. Y.

See Advertisement on Page 901, 96C


Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.

Heiland Research Corp., 130 E. 5th St. Denver 10, Colo.

Pan American Electric Co., Inc., 2912 Atlantic Ave., Brooklyn 7, N. Y.

See Advertisement on Page 56

Dillon & Co., Inc., W. C. 5410 W. Harrison St., Chicago 33, Ill.

Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.

Rek-O-Kut 146 Grand 14th St., New York 12, N. Y.

See Advertisement on Page 245

Sound Apparatus Co., 233 Broadway, New York 7, N. Y.

See Advertisement on Pages 88, 89

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 88, 89

Dillon & Co., Inc., W. C. 5410 W. Harrison St., Chicago 33, Ill.

Hathaway Instrument Co., 1315 S. Clarkson St., Denver 10, Colo.

Sipp-Eastwood Corp. Keen & Summer Sts., Paterson, N. J.

METERS—Temperature

Andrew Co., 363 E. 75th St., Chicago 19, Ill.

Assembly Products, Inc., Chagrin Falls, Ohio

Davison Co., 131 Central Ave., Newark 4, N. J.

General Electric Co., Schenectady 5, N. Y.

See Advertisement on Pages 96B, 96C


Pan American Electric Co., Inc., 2912 Atlantic Ave., Brooklyn 7, N. Y.

Precision Apparatus Co., 92-21 Horace Harding Blvd., Elmhurst, N. Y.

See Advertisement on Page 226

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 85, 86

Airainco Inc., Melrose Ave. & Battery Pl., Stamford, Conn.

Aircraft Radio Corp., Boonton, N. J.

See Advertisement on Page 193

Bud Radio Co., 3118 E. 55th St., Cleveland 10, Ohio

Decleof 742 W. Colfax Ave., Denver 4, Colorado

General Communication Co., 520 Common-

wealth Ave., Boston 15, Mass.

General Electric Co., 275 Massachusetts Ave.,

Cambridge 39, Mass.


See Advertisements on Pages 91, 95


See Advertisement on Page 44

Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 88, 89

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 228

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 88, 89

Airainco Inc., Melrose Ave. & Battery Pl., Stamford, Conn.

Aircraft Radio Corp., Boonton, N. J.

See Advertisement on Page 193

Bud Radio Co., 3118 E. 55th St., Cleveland 10, Ohio

Decleof 742 W. Colfax Ave., Denver 4, Colorado

General Communication Co., 520 Common-

wealth Ave., Boston 15, Mass.

General Electric Co., 275 Massachusetts Ave.,

Cambridge 39, Mass.


See Advertisements on Pages 91, 95


See Advertisement on Page 44

Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 88, 89

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 228

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 88, 89

Airainco Inc., Melrose Ave. & Battery Pl., Stamford, Conn.

Aircraft Radio Corp., Boonton, N. J.

See Advertisement on Page 193

Bud Radio Co., 3118 E. 55th St., Cleveland 10, Ohio

Decleof 742 W. Colfax Ave., Denver 4, Colorado

General Communication Co., 520 Common-

wealth Ave., Boston 15, Mass.

General Electric Co., 275 Massachusetts Ave.,

Cambridge 39, Mass.


See Advertisements on Pages 91, 95


See Advertisement on Page 44

Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 88, 89

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 228

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 88, 89

Airainco Inc., Melrose Ave. & Battery Pl., Stamford, Conn.

Aircraft Radio Corp., Boonton, N. J.

See Advertisement on Page 193

Bud Radio Co., 3118 E. 55th St., Cleveland 10, Ohio

Decleof 742 W. Colfax Ave., Denver 4, Colorado

General Communication Co., 520 Common-

wealth Ave., Boston 15, Mass.

General Electric Co., 275 Massachusetts Ave.,

Cambridge 39, Mass.


See Advertisements on Pages 91, 95


See Advertisement on Page 44

Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 88, 89

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 228

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.
MILLIMETERS

Westinghouse Electric Corp., Meter Div., Newark, N. J.

Westinghouse Instrument Corp., 318 Frelinghuysen Ave., Newark 5, N. J.

MILLIVOLTMETERS

Assembly Products, Inc., Chagrin Falls, Ohio

Ballantine Labs., Inc., Boonton, N. J.

See Advertisement on Page 114


Burlington Instrument Co., 214 N. 4th St., Schenectady, N. Y.

Commercial Research Labs., Inc., 20 Bartlett Ave., Milford, N. H.

Development Engineering Co., Inc., The, 3923 S. Sangamon St., Chicago, Ill.

Electric Heat Control Co., The, 9123 Inman Ave., Cleveland 5, Ohio

Electronic Development Co., 4220 N. 23rd St., Omaha 11, Nebraska

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 96B, 96C

General Electronics, Inc., 101 Hazel Street, Paterson, N. J.


General Electronics, Inc., 101 Hazel Street, Paterson, N. J.

General Electric Co., Syracuse, N. Y.

See Advertisements on Pages 96, 96A


Lampkin Labs., Inc., 3186 Market St., Philadelphia 34, Pa.

Radio Corp. of America, RCA Victor Div., Camden, N. J.

See Advertisements on Inside Back Cover & Back Cover, 231

West Coast Electronics Co., 1301 S. Burlington St., Los Angeles 6, Calif.

MONITORS—Frequency


Collins Radio Co., Cedar Rapids, Iowa

See Advertisements on Pages 36 to 39

Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.

General Electric Co., Syracuse, N. Y.

See Advertisements on Page 96, 96A


Lampkin Labs., Inc., Bradford, Fla.

See Advertisement on Page 256

Link, Fred M., 125 W. 17th St., New York, N. Y.


Milken Mfg. Co., James, 150 Exchange St., Providence, R. I.

Measurement Instrument Co., 103 Lafayette St., New York, N. Y.

Radio Corp. of America, RCA Victor Div., Camden, N. J.

See Advertisement on Page 103

Radio Laboratories, Inc., Columbus, Ohio

Sylvania Electric Products, Inc., 500 5th Ave., New York, N. Y.

See Advertisements on Pages 158 to 161

West Coast Electronics Co., 1301 S. Burlington St., Los Angeles 6, Calif.

MONITORS—Modulation

Collins Radio Co., Cedar Rapids, Iowa

See Advertisements on Pages 36 to 39

Doolittle Radio, Inc., 7421 S. Loomis Blvd., Chicago 36, Ill.

Du Mont Labs., Inc., Allen B., 2 Main Ave., Passaic, N. J.

General Electric Co., Syracuse, N. Y.

See Advertisements on Pages 96, 96A

Pan American World Airways, Inc., 128 Atlantic Ave., Brooklyn 7, N. Y.

Poland Electronics Co., 155 Liberty St., New York 6, N. Y.


Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.


Television Projects, Inc., 24 Walnut St., Newark 2, N. J.

MONITORS—Television Master

Du Mont Labs., Inc., Allen B., 2 Main Ave., Passaic, N. J.

General Electric Co., Syracuse, N. Y.

See Advertisements on Pages 96, 96A

Pan American World Airways, Inc., 128 Atlantic Ave., Brooklyn 7, N. Y.


Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.


Television Projects, Inc., 24 Walnut St., Newark 2, N. J.

MONITORS—Television System

Alliance Mfg. Co., Lake Park Blvd., Alliance, Ohio

See Advertisement on Page 182

Ameriphone Co., 16 52nd St., New York 33, N. Y.

Anco Products Co., 757 Market St., Paterson, N. J.

Armstrong Cork Co., 126 Broad St., New York 22, N. Y.

Barker Corp., 212 River St., Newark 3, N. J.


Bodine Electric Co., Ohio St. & Oakley Ave., Cleveland 14, Ohio


Century Electric Co., 1806 Pine St., Oklahoma City, Okla.

Continenta l Electronics Co., 3232-237 Ferry St., Newark, N. J.

Cylohm Motor Corp., 5-17 48 Rd., L. I. City 1, N. Y.

See Advertisement on Page 252

Dayton Acme Co., 380 York St., Cincinnati 14, Ohio

DeLo Appliance Div., General Motors Corp., 315 Lyell Ave., Rochester, N. Y.

Delex Mfg. Co., 120 S. 2nd St., Somerville, N. J.

Eastern Television Devices, Inc., 585 Dean St., Brooklyn 17, N. Y.

See Advertisement on Page 172

Eleor, Inc., 1501 W. Congress St., Chicago 3, Ill.

See Advertisement on Page 210

Electric Indicator Co., 21 Parker Ave., Racine, Wisc.

Electric Specialty Co., 311 South St., Stanford, Conn.

Penn Marion, Gear & Instrument Corp., Jamaica 1, N. Y.

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 96B, 96C

General Industries Co., Taylor & Olive Sts., Elyria, Ohio

Glidden-Cabot, Div. of First Industrial Corp., Alliance, Ohio

Jack & Hants Precision Industries, Inc., Los Angeles, Calif.

Janette Mfg. Co., 556 W. Monroe St., Chicago 6, Ill.

Kato Engineering Co., 550 N. Front St., Manistost, Minn.

Leeds & Northrup Co., Orchard Park, N. Y.

L. G. Electric Co., 1801 Webster St., Dayton 14, Ohio

Magnetic Products Corp., The, Norwalk, Conn.

Ohio Electric Mfg. Co., 5909 Maurice Ave., Cleveland 4, Ohio


Reynolds Electric Co., 2600 W. Congress St., Chicago 2, Ill.

Robbins & Myers, 1345 Lagonda Ave., Cincinnati, Ohio


Schauer Machine Co., Cincinnati 2, Ohio

Smith Mfg. Corp., 1630 Elm St., Chicago 23, Ill.

Smith Mfg. Co., A. P. O. Box 508, Rochester 2, N. Y.


Superior Electric Co., 81 Laurel St., Bristol, Conn.


Universal Electric Co., 590 E. Main St., Owosso, Mich.

Victor Electric Products, Inc., 2650 Robertson Ave., Dayton 14, Ohio

Wagner Electric Corp., 4600 Plymouth Ave., Cleveland 10, Ohio

Walker-Turner Co., Inc., 1463 Herndon Ave., Plainfield, Ill.

Westbrook-Chicago Corp., 5622 Bloomdale Ave., Cleveland 3, Ohio

Wincharger Corp., 7th & Division Sts, Sioux City, Iowa

MOTORS—Phonograph

Alliance Mfg. Co., Lake Park Blvd., Alliance, Ohio

See Advertisement on Page 182

Barks Electric Co., 12th & Cranberry Sts., Elyria, Ohio

Fairchild Camera & Instrument Corp., 61 Van Wyck Blvd., Jamaica 1, N. Y.

Favorite Mfg. Co., 105 E. 12th St., New York 3, N. Y.

Garrett Sales Corp., 401 Broadway, New York 13, N. Y.

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 96B, 96C

General Industries Co., Taylor & Olive Sts., Elyria, Ohio

Magnetic Products Corp., Norwalk, Conn.

Rek-O-Kut Co., 146 Grand St., New York 13, N. Y.

See Advertisement on Page 245

Spiral Products Corp., 100-02-04 Grand St., Grand St., Brooklyn 24, N. Y.

Webster Chicago Corp., Electronics Div., N. 59th St., Armidale, N. Y.

Wincharger Corp., 7th & Division Sts, Sioux City, Iowa

MOTORS—Remote Control

Barber Colman Co., River & Loomis Sts., Rockford, Ill.
NAME PLATES
See Plates, Name

NEEDLES—Phasing
Acme Fire Alarm Co., Inc., 106 Seventh Ave., New York 11, N. Y.
American Radio Co., 411 E. Garfield Ave., Glendale, Calif.
Andrew Co., 363 E. 57th St., Chicago 11, Ill.
Johnson Co., E. F., 235 Ashland Ave., Chicago 8, Ill.
Westinghouse Electric Corp., Industrial Electronics Div., Baltimore, Md.

NETWORKS—Directional Antenna Phasing
Aero Communications, Inc., 231 Main Street, New Haven, Conn.
Burling & Co., Inc., 11576 Rutland Ave., New York 29, N. Y.
Burrus & Co., Canal Street, New York 1, N. Y.

NUTS—Self-Locking
Boots Aircraft Nut Corp., New Canaan, Conn.
Columbia Nut & Bolt Co., 345 M Main St., Bridgeport, Conn.

NUTS—Sealing
American Screw Co., Providence, R. I.

OEM HUMMERS
Assembly Products, Inc., Chagrin Falls, Ohio

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHASING
Acme Fire Alarm Co., Inc., 106 Seventh Ave., New York 11, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOMETERS
H. F. Mfg. Co., 4111 Ft. Hamilton Parkway, Brooklyn 9, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOSTAT MACHINES
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOSYNTHETICS

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOSENSITIVE MATERIALS
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOFINISHING
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOGRAPHIC PROJECTORS
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOGRAPHIC SERVICES
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOGRAPHIC SUPPLIES
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOGRAPHIC SERVICES
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOGRAPHY
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOGRAPHY-REPRODUCTION
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOFINISHING
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOGRAPHIC SERVICES
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOGRAPHIC SUPPLIES
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.

PHOTOGRAPHIC SERVICES
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.

PARKER KALON CORP., 200 Varick St., New York 14, N. Y.
OSCILLATORS

1947-1948 DIRECTORY of ELECTRONICS BUYERS' GUIDE

Oscillators

Oscillators — Telephone


Brown Engineering Co., 4816 S. E. Haw- thorne Blvd., Portland 10, Oregon


Clarks Instrument Corp., 910 King St., Boston 8, Mass.

Collins Radio Co., Cedar Rapids, Iowa

See Advertisements on Page 99, 109

D & M., Mfg., Co., 2 Delford Ave., Bergenfield, N. J.

Collins Radio Co., Cedar Rapids, Iowa

See Advertisements on Pages 30 to 35

Decimeter, 742 W. Colfax Ave., Denver 7, Colo.

Electronic Apparatus, 856 3rd Ave., New York 17, N. Y.

Hickok Electrical Instrument Co., The, 1775 Broadway, New York, N. Y.

Hazeltine Electronics Corp., 1775 Broadway, New York, N. Y.


Patterson Blvd., Dayton 1, Ohio

Radio Corp. of America, Tube Div. Har- rison, N. J.

Raytheon Manufacturing Co., 16 West Broadway, Harrison, N. J.

RCA Victor Div., 409 E. Exchange St., Port- land 5, Ore.


See Advertisement on Page 76

Westinghouse Electric Corp., 15 Broadway, New York 7, N. Y.

See Advertisements on Pages 88, 89

Wilson & Co., G. C., 2 N. Passaeta Ave., Chatham, N. J.

Browning Labs., Inc., 750 Main St., Win- chester, Mass.

See Advertisement on Page 65

Central Scientific Co., 4500 S. Dixie Park Blvd., Chicago 13, Ill.

Cleveland Baking Co., 405 N. Broadway, Chicago, Ill.


Electronic Development Lab., 2855 W. 19th St., Chicago 9, Ill.

Electronic Tube Corp., 1000 E. Mermaid Ave., Camden, N. J.

Furst Electronics, 800 N. Ward Ave., Chicago 25, Ill.

See Advertisement on Page 248


Hickok Electrical Instrument Co., 10514 Du Pont Ave., Cleveland, Ohio

Industrial Electronics, Inc., 1249 Main St., Malden, Mass.

See Advertisement on Page 256

Industrial Instruments Inc., 17 Pollack Ave, West New York, N. Y.

Motorola Inc., 96 E. Chicago St., Chicago 14, Ill.

See Advertisements on Pages 96, 96A

Raytron, Inc., 407 N. Jackson St., Jackson, Miss.

Supreme Instrument Corp., Greenwood, Miss.

Sylvania Electric Products, Inc., 500 Fifth Ave., New York 7, N. Y.

See Advertising on Pages 158 to 161


Triumph Labs., Inc., 750 Main St., Win- chester, Mass.


Oscillators — Radio Frequency


Brown Engineering Co., 4816 S. E. Haw- thorne Blvd., Portland 10, Oregon


Clarks Instrument Corp., 910 King St., Boston 8, Mass.

Collins Radio Co., Cedar Rapids, Iowa

See Advertisements on Page 99, 109

D & M., Mfg., Co., 2 Delford Ave., Bergenfield, N. J.

Collins Radio Co., Cedar Rapids, Iowa

See Advertisements on Pages 30 to 35

Decimeter, 742 W. Colfax Ave., Denver 7, Colo.

Electronic Apparatus, 856 3rd Ave., New York 17, N. Y.

Hickok Electrical Instrument Co., The, 1775 Broadway, New York, N. Y.

Hazeltine Electronics Corp., 1775 Broadway, New York, N. Y.


Patterson Blvd., Dayton 1, Ohio

Radio Corp. of America, Tube Div. Har- rison, N. J.

Raytheon Manufacturing Co., 16 West Broadway, Harrison, N. J.

RCA Victor Div., 409 E. Exchange St., Port- land 5, Ore.


See Advertisement on Page 76

Westinghouse Electric Corp., 15 Broadway, New York 7, N. Y.

See Advertisements on Pages 88, 89

Wilson & Co., G. C., 2 N. Passaeta Ave., Chatham, N. J.

Browning Labs., Inc., 750 Main St., Win- chester, Mass.

See Advertisement on Page 65

Central Scientific Co., 4500 S. Dixie Park Blvd., Chicago 13, Ill.

Cleveland Baking Co., 405 N. Broadway, Chicago, Ill.


Electronic Development Lab., 2855 W. 19th St., Chicago 9, Ill.

Electronic Tube Corp., 1000 E. Mermaid Ave., Camden, N. J.

Furst Electronics, 800 N. Ward Ave., Chicago 25, Ill.

See Advertisement on Page 248


Hickok Electrical Instrument Co., 10514 Du Pont Ave., Cleveland, Ohio

Industrial Electronics, Inc., 1249 Main St., Malden, Mass.

See Advertisement on Page 256

Industrial Instruments Inc., 17 Pollack Ave, West New York, N. Y.

Motorola Inc., 96 E. Chicago St., Chicago 14, Ill.

See Advertisements on Pages 96, 96A

Raytron, Inc., 407 N. Jackson St., Jackson, Miss.

Supreme Instrument Corp., Greenwood, Miss.

Sylvania Electric Products, Inc., 500 Fifth Ave., New York 7, N. Y.

See Advertising on Pages 158 to 161


Triumph Labs., Inc., 750 Main St., Win- chester, Mass.

**PANELS—Relay Rack**

Art-Lloyd Metal Products Corp., 2973 Croy Ave., Cleveland, Ohio
See Advertisement on Page 236

PAPER—Insulation Materials

Advan Products, Inc., 117 N. Main St., Brookline, Mass.
Radio Inventions, Inc., 155 Perry St., New York, N. Y.
Times Facsimile Corp., 229 W. 43rd St., New York, N. Y.
W. W. Union Telegraph Co., 60 Hudson St., New York, N. Y.

PERMEAMETERS—High H


PHENOCLAY MOLDING COMPOUNDS

See Insulating Compounds

PHONOGRAPH—Electric Phonographs & Record Players

Admiral Corp., 3800 Cortland St., Chicago 47, Ill.
Air-King Products Co., Inc., 1523 23rd St., Brooklyn, N. Y.
Andrus Magnetics, Inc., 45-29 35th St., L. I., City, N. Y.
Autocar Corp., 41 Joes Ave., West Hempstead, N. Y.
Audak Corp., 515 Fifth Ave., New York, N. Y.
Audio Industries, Michigan City, In.
Avocet Radio Corp., 3835 N. Hamilton Ave., Chicago 15, Ill.
Aviola Radio Corp., Phoenix, Arizona
Bell Telephone Co., Inc., 3113 Essex Ave., Columbus, Ohio


Bendix Radio Div., Bendix Aviation Corp., Baltimore 6, Md.
Bostwick Radio Corp., 15 A. V. A., New York 1, N. Y.
Borg & David, 663 Broadway, New York 13, N. Y.
Carroll Motors Associates, Ltd., 505 Morse St., N. E., Washington 2, D. C.
Carron Mfg. Co., 415 E. 10th St., Chicago 31, Ill.
Collins Audio Products Co., 126 Park St., New York 17, N. Y.

See Advertisement on Page 236

COMMUNICATION PRODUCTS

Comm-Aid, Inc., 2003 E. 18th St., New York 3, N. Y.
Continuous Electronics Corp., 5101 N. Paulina St., Chicago 32, Ill.
Deco-Graphics, Inc., 50-5 W. 57th St., N. Y.
Eastern Amplifier Corp., 794 E. 140th St., New York 73, N. Y.
Eastern Electronics Corp., 41 Chestnut St., New York 7, N. Y.
Electronic Corp. of America, 170 53rd St., Newark, N. J.
Electronic Devices Co., 601 W. 26th St., New York 10, N. Y.
Electronic Enterprises, Inc., 1314 Forest Ave., Dallas 15, Texas.
Emerson Radio & Phonograph Corp., 110 Eighth Ave., New York 19, N. Y.
Eaton Corp., 306 29th St., New York 18, N. Y.
Fado Radio & Electronics Co., Inc., 56-29 74th St., Maspeth, N. Y.
Favorite Mfg. Co., 106 12th St., New York 19, N. Y.
Fisher Radio Co., 41 E. 47th St., New York 16, N. Y.
Gary Son, 416 Broadway, Cambridge, Mass.
Globe Electronics, Inc., 225 W. 17th St., N. Y.
Godfrey Mfg. Co., 171 S. 2nd St, Milwaukee, Wis.
Haltechers, Inc., 4401 W. Fifth Ave., Cleveland 7, Ohio.
General Electric Co., Bridgeport 2, Conn.
Globeco, Inc., 401 W. 26th St., New York 10, N. Y.
George Radio & Television Co., 72 Cortlandt St., N. Y.
General Electric Co., Bridgeport 2, Conn.
Globe Electronics, Inc., 225 W. 17th St., N. Y.
Godfrey Mfg. Co., 171 S. 2nd St, Milwaukee, Wis.
Haltechers, Inc., 4401 W. Fifth Ave., Cleveland 7, Ohio.
Genecar, Inc., 4801 W. Fifth Ave., Cleveland 7, Ohio.
Geneco Electric Co., Bridgeport 2, Conn.
Globe Electronics, Inc., 225 W. 17th St., N. Y.
Godfrey Mfg. Co., 171 S. 2nd St, Milwaukee, Wis.
Haltechers, Inc., 4401 W. Fifth Ave., Cleveland 7, Ohio.
Genecar, Inc., 4801 W. Fifth Ave., Cleveland 7, Ohio.
Geneco Electric Co., Bridgeport 2, Conn.
Globe Electronics, Inc., 225 W. 17th St., N. Y.
Godfrey Mfg. Co., 171 S. 2nd St, Milwaukee, Wis.
Haltechers, Inc., 4401 W. Fifth Ave., Cleveland 7, Ohio.
Genecar, Inc., 4801 W. Fifth Ave., Cleveland 7, Ohio.
Geneco Electric Co., Bridgeport 2, Conn.
Globe Electronics, Inc., 225 W. 17th St., N. Y.
Godfrey Mfg. Co., 171 S. 2nd St, Milwaukee, Wis.
Haltechers, Inc., 4401 W. Fifth Ave., Cleveland 7, Ohio.
Genecar, Inc., 4801 W. Fifth Ave., Cleveland 7, Ohio.
Geneco Electric Co., Bridgeport 2, Conn.
Globe Electronics, Inc., 225 W. 17th St., N. Y.
Godfrey Mfg. Co., 171 S. 2nd St, Milwaukee, Wis.
Haltechers, Inc., 4401 W. Fifth Ave., Cleveland 7, Ohio.
Genecar, Inc., 4801 W. Fifth Ave., Cleveland 7, Ohio.
Geneco Electric Co., Bridgeport 2, Conn.
Globe Electronics, Inc., 225 W. 17th St., N. Y.
Godfrey Mfg. Co., 171 S. 2nd St, Milwaukee, Wis.
Haltechers, Inc., 4401 W. Fifth Ave., Cleveland 7, Ohio.
Genecar, Inc., 4801 W. Fifth Ave., Cleveland 7, Ohio.
Geneco Electric Co., Bridgeport 2, Conn.
Globe Electronics, Inc., 225 W. 17th St., N. Y.
Godfrey Mfg. Co., 171 S. 2nd St, Milwaukee, Wis.
Haltechers, Inc., 4401 W. Fifth Ave., Cleveland 7, Ohio.
Genecar, Inc., 4801 W. Fifth Ave., Cleveland 7, Ohio.
Geneco Electric Co., Bridgeport 2, Conn.
Globe Electronics, Inc., 225 W. 17th St., N. Y.
Godfrey Mfg. Co., 171 S. 2nd St, Milwaukee, Wis.
Haltechers, Inc., 4401 W. Fifth Ave., Cleveland 7, Ohio.
Genecar, Inc., 4801 W. Fifth Ave., Cleveland 7, Ohio.
PHOTOTUBES AND PHOTOCELLS
See Tubes

PICKUPS—Industrial
Brush Development Co., 3405 Perkins Ave., Cleveland 14, Ohio
Wilson & Co., C. N. N. Passave Ave., Chatham, N. Y.

PICKUPS—Magnetic
Audak Co., 500 Fifth Ave., New York, N. Y.
Calton Co., 11821 W. Pico Blvd., Los Angeles 34, Calif.
Clarkman Corp., 11257 W. Pico Blvd., Los Angeles 34, Calif.
Consolidated Engineering Corp., 656 E. 121st St., New York 53, N. Y.

PICKUPS—Photoelectric
Electronic Products Co., 19 No. First St., Geneva, N. Y.

PHOTOGRAMS
1947-1948 DIRECTORY

West Coast Electronics Co., 1401 S. Burton St., Los Angeles 6, Calif.
Western Electric Co., 195 Broadway, New York 7, N. Y.
See Advertisements on Pages 88, 89

PILOTS—Automatic
Eclipse Pioneer Div., Bendix Aviation Corp., Binghamton, N. Y.
Mettler Co., Lee B., 106 S. Main St., Los Angeles 21, Calif.
Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.
See Advertisements on Pages 805, 806

PITCH
See Insulating Compounds

PLASTIC MATERIALS

Allyl
Goodrich Chemical Co., B. F., Cleveland 15, Ohio

Cellulose Acetate
Austin Elec. Co., 335 Throop Ave., Brooklyn 11, N. Y.
Bamberger, A., 44 Hewes St., Brooklyn 15, N. Y.
Blum & Co., Julius, 532 W. 22nd St., New York 10, N. Y.
Celenease Plastics Corp., 180 Madison Ave., New York 10, N. Y.
Chemaco, Inc., 552 W. 22nd St., New York 10, N. Y.
Clevenger Chemicals Co., Subs. of Manufacturers Chemical Corp., Berkeley Heights, N. J.
Davis Plastics Corp., Joseph, Schuler & Fj., 1101 N. 4th St., Trenton, N. J.
Eclipse Pioneer Div., Bendix Aviation Corp., Binghamton, N. Y.
Eliott Co., L. N., 1909 Liberty St., Trenton, N. J.
International Merit Products Corp., 254 Fifth Ave., New York 17, N. Y.
New Hampshire Bell Bearings, 5 Main St., Peterborough, N. H.
New Co. J. M., Patterson, N. J., N. J.
Permco, Inc., 6415 Ravenwood Ave., Chicago, Ill.
R. E. Steel Co., Herman D., Lafayette Bldg., Chicago, Ill.

Ph. METERS, RECORDERS AND COM- PUTERS
See Meters

PHOTOCOPY MACHINES
See Machines

D-74
ELECTRONIC and ALLIED PRODUCTS

PLASTIC MATERIALS


Cellulose Acetate Butyrate
Bamberger Corp., A, 44 Hewes St., Brooklyn, N. Y.
Blum Co., Julius, 522 W. 22nd St., New York 11, N. Y.
David Plastics Co., Joseph, Schuyler at Ft. of Quincy Ave., Arlington, N. J.
Eastman Kodak Co., Industrial Photo Products Div., Rochester 4, N. Y.
Felsenthal & Sons, G., 4100 W. Grand Ave., Chicago 53, Ill.
Oppenheiner Inc., Alan D., 582-584 Exchange St., Buffalo, N. Y.
Plastic Accessories, Inc., 460 Broome St., New York 13, N. Y.
Plasticraft Products Co., 20 Hudson St., New York 14, N. Y.

Methyl Methacrylate
American Phenolic Corp., 1830 S. 54th Ave., Chicago 50, III.
See Advertisement on Page 23
American Resinous Chemical Co., 104 Poster St., Peabody, Mass.
Bamberger Corp., A, 44 Hewes St., Brooklyn N. Y.
Emeloid Co., The, 291 Laurel Ave., Burlington, N. J.
Felsenthal & Sons, G., 4100 W. Grand Ave., Chicago 57, Ill.
Oppenheiner Inc., Alan D., 582-584 Exchange St., Buffalo, N. Y.
Plastic Accessories, Inc., 460 Broome St., New York 13, N. Y.

Phenol Formaldehyde—(Phenolics)
Adhesive Products Co., 3400 13th St., SW, Washington 6, D. C.
Alden Products Co., 117 No. Main St., Milford, Conn.
American Phenolic Corp., 1830 S. 54th Ave., Chicago 50, III.
American Resinous Chemical Co., 104 Poster St., Peabody, Mass.
Baez Co., N.S., 9 Montgomery St., hillside, N. J.
See Advertisement on Page 227
Bakelite Corp., 300 Madison Ave., New York 17, N. Y.
Catalin Corp., 1 Park Ave., New York 17, N. Y.
Drackei, G., 5020 Spring Grove Ave., Cincinnati 21, Ohio.
Insulating Fabricators, Inc., 12 E. 12th St., New York 3, N. Y.
Interlake Chemical Corp., Union Commerce Bldg., Cleveland 14, Ohio.
Kuhn & Jacob Molding & Tool Co., 1200 Southard St., Trenton, N. J.
LaPointe-Plascomold Corp., Unionville, Conn.
Mica Insulator Co., Schenectady 1, N. Y.
Pondvinnell Oil Products Co., Petrolia, Pa.
Plastic Accessories, Inc., 460 Broome St., New York 13, N. Y.
See Advertisement on Page 97

Ethyl Cellulose
Bamberger Corp., A, 44 Hewes St., Brooklyn, N. Y.
Celanese Plastics Corp., 180 Madison Ave., New York 16, N. Y.
Davis Plastics Co., Joseph, Schuyler & Ft. of Quincy Ave., Arlington, N. J.
Chemical & Specialty of Manufacturers Chemical Corp., Berkeley Heights, N. J.
Chemaco Corp., Subsidiary of Manufacturers Chemical Corp., Berkeley Heights, N. J.
Davis Plastics Co., Joseph, Schuyler at Ft. of Quincy Ave., Arlington, N. J.
Felsenthal & Sons, G., 4100 W. Grand Ave., Chicago 57, Ill.
Insulating Fabricators, Inc., 265 W. Grand Ave., Chicago 51, Ill.
See Advertisement on Page 87
Manufacturers Chemical Corp., Berkeley Heights, N. J.
Nixon Nitration Wks., Nixon, N. J.
Oppenheiner Inc., Alan D., 582-584 Exchange St., Buffalo, N. Y.
Plastic Accessories, Inc., 460 Broome St., New York 13, N. Y.

Melamine Formaldehyde
American Cyanamid Co., Plastics Div., 30 Rockefeller Plaza, New York 20, N. Y.
Ciba Products Co., Inc., 627 Greenwich St., New York 13, N. Y.
Herzfeld & Co., Inc., 909 Market St., Wilmington 99, Del.
Insulating Mfg. Co., Inc., 12 E. 12th St., New York 2, N. Y.

Polyethylene
American Phenolic Corp., 1830 S. 54th Ave., Chicago 50, Ill.
See Advertisement on Page 23
Bakelite Corp., 300 Madison Ave., New York 17, N. Y.
Bamberger Corp., A, 44 Hewes St., Brooklyn 6, N. Y.
David Plastics Co., Joseph, Schuyler at Ft. of Quincy Ave., Arlington, N. J.
Felsenthal & Sons, G., 4100 W. Grand Ave., Chicago 57, Ill.
Oppenheiner Inc., Alan D., 582-584 Exchange St., Buffalo, N. Y.
Plastic Accessories, Inc., 460 Broome St., New York 13, N. Y.
Plastic Accessories, Inc., 460 Broome St., New York 13, N. Y.
Plastcraft Products Co., 20 Hudson St., New York 14, N. Y.

Polytetrafluoroethylene
Insulating Fabricators, Inc., 12 E. 12th St., New York 3, N. Y.
Interlake Chemical Corp., Union Commerce Bldg., Cleveland 14, Ohio.
Kuhn & Jacob Molding & Tool Co., 1200 Southard St., Trenton, N. J.
LaPointe-Plascomold Corp., Unionville, Conn.
Mica Insulator Co., Schenectady 1, N. Y.
Oppenheiner Inc., Alan D., 582-584 Exchange St., Buffalo, N. Y.
Plastic Accessories, Inc., 460 Broome St., New York 13, N. Y.
Plastcraft Products Co., 20 Hudson St., New York 14, N. Y.
Plastic Accessories, Inc., 460 Broome St., New York 13, N. Y.
Plastcraft Products Co., 20 Hudson St., New York 14, N. Y.

Polyurethane
American Phenolic Corp., 1830 S. 54th Ave., Chicago 50, III.
See Advertisement on Page 23
Bakelite Corp., 300 Madison Ave., New York 17, N. Y.
Bamberger Corp., A, 44 Hewes St., Brooklyn 6, N. Y.
Blum & Co., Julius, 522 W. 22nd St., New York 14, N. Y.
Catalin Corp., 1 Park Ave., New York 17, N. Y.
Chemaco Corp., Berkeley Heights, N. J.
Davis Plastics Co., Joseph, Schuyler at Ft. of Quincy Ave., Arlington, N. J.
Emeloid Co., Inc., The, 291 Laurel Ave., Burlington, N. J.
Felsenthal & Sons, G., 4100 W. Grand Ave., Chicago 57, Ill.
Oppenheiner Inc., Alan D., 582-584 Exchange St., Buffalo, N. Y.
Plastic Accessories, Inc., 460 Broome St., New York 13, N. Y.

Resins
Bamberger Corp., A, 44 Hewes St., Brookv, N. Y.
Barrett Div., Allied Chemical & Dye Corp., Newark 5, N. J.
Catalin Corp., One Park Ave., New York 17, N. Y.
Ciba Co., Inc., 627 Greenwich St., New York 13, N. Y.
Drackei, G., 5020 Spring Grove Ave., Cincinnati 21, Ohio.
Sylvar Corp., 415 E. Front St., Wilmington 99, Del.
Taylor Ferry Co., Norristown, Pa.
U. S. Plastic Corp., 2525-32 Irving Park Road, Chicago, III.
Watertown Mfg. Co., Watertown, Conn.
Wilmington Speciality Co., P. O. Drawer 1028, Wilmington 99, Del.

PLASTIC MATERIALS

Shawingan Products Corp., 350 5th Ave., Brooklyn, N. Y.
Simon Frazer, 415 E. Front St., Wilmington, Delaware
Tennessee Insulating Co., Div. Eastman
U. S. Rubber Co., 1321 8th Ave., New York
U. S. Signawre Co., Akron 9, Ohio
Valite Corp., Whitney Blvd., New Orleans

Silicone Resin
Dow Corning Corp., Midland, Mich.

Urea Formaldehyde
American Cyanamid Co., Plastics Div., 30 Rockefeller Plaza, New York 20, N. Y.
Kuhn & Jacob Molded & Teol Co., 1200 South St., Trenton, N. J.
Mica Insulator Co., Schenectady 1, N. Y.
Fission Division, Libbey-Owens-Ford Glass Co., Van Noy Ave., Toledo 6, Ohio
Resinite Products & Chemical Co., Inc., 222 W. Washington Square, Pella, Iowa
Synthetic Resins, Inc., 122 E. 42nd St., New York, N. Y.

Vinyl Compounds
American Phenolic Corp., 1800 5th Ave., Chicago 50, Ill.
See Advertisement on Page 23
Bakelite Corp., 300 Madison Ave., New York 10, N. Y.
Bamberger Corp., A., 44 Hewes St., Brooklyn, N. Y.
Holmes-Queensboro Co., Inc., E. L. Plastics Deport, 626 Schuyler Ave., Arlington 1, N. Y.
Emeloid Co. Inc., The, 291 Laurel Ave., Arlington 1, N. Y.
Goodrich Chemical Co., B. F., Cleveland 15, Ohio
Manufacturers Chemical Corp., Berkeley Heights, N. J.
Oppenheimer Inc., Alan D., 552-556 Exchange St., Buffalo, N. Y.
Plastic Fabricators Co., Inc., 600 Sansome St., San Francisco, Calif.
Resinite Inc. Wellington Ave., Cranston 10, R. I.

PLATES—Name
Aerocraft Co., 9-12 Morrell St., Elizabeth 4, N. J.
American Emblem Co., Utica, N. Y.
American Sign Mfg. Co., Inc., 103 Lafayette St., New York 13, N. Y.
Austin Hardware & Mfg. Co., 29-01 39th Ave., Brooklyn 1, N. Y.
Bud Radio Inc., 2118 E. 55th St., Cleveland 2, Ohio.
Colonial Brass Co., 100 Vine St., Middleboro, Mass.
Control Corp., 715 Central Ave., Minneapolis 14, Minn.
Cronamee, Inc., 3701 Ravenswood Ave., Chicago 37, Ill.
Emeloid Co. Inc., The, 291 Laurel Ave., Arlington 1, N. Y.
Etched Products Corp., 35-01 Queens Blvd., Long Island City, N. Y.
Gordon Specialties Co., 825 W. Babash Ave., Chicago 5, Ill.
Gunmetal Inc., L. F., 38 Union St., Allentown, Pa.
Hopps Inc., 460 W. 34th St., New York, N. Y.
Insuline Corp. of America, 36-02 53rd Ave., Long Island City, N. Y.
Laminol Fabricators, 3600 W. Potomac Ave., Chicago 61, Ill.
Mica Insulator Co., Schenectady 1, N. Y.
New England Etching & Plating Co., 25 Spring St., Rochester 1, N. Y.
Plastic Fabricators Co., 244 Sansome Street, San Francisco, Calif.
Premier Metal Etching Co., 21-03 44th Ave., Long Island City, N. Y.
Reynolds Metals Co., 2500 So. Third St., Louisville 1, Ky.
Silverlock-Miller Co., 10 Parker Ave., W. 80, Orange, N. J.

PLATING Metal on Plastic
Austin Co., O., 355 Throop Ave., Brooklyn 21, N. Y.
Baker & Co., 213 Astor St., Newark 5, N. J.
Bart Labs, Inc., Main St., Belleville 9, N. J.
Electro Plastic Processes, 2125 West Charleston St., Chicago 41, Ill.
Huntington Mfg. Co., The, 17 Academy St., Newark 2, N. J.
Waterbury Mfg. Co., Inc., Waterbury 90, Conn.

PLUGS—Terminal
Aerocraft Corp., 1800 5th Ave., Chicago 50, Ill.
See Advertisement on Page 23
American Phenolic Corp., 1800 5th Ave., Chicago 50, Ill.
See Advertisement on Page 23
American Phenolic Corp., 1800 5th Ave., Chicago 50, Ill.
See Advertisement on Page 23
American Phenolic Corp., 1800 5th Ave., Chicago 50, Ill.
See Advertisement on Page 23
American Phenolic Corp., 1800 5th Ave., Chicago 50, Ill.
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American Phenolic Corp., 1800 5th Ave., Chicago 50, Ill.
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American Phenolic Corp., 1800 5th Ave., Chicago 50, Ill.
See Advertisement on Page 23
American Phenolic Corp., 1800 5th Ave., Chicago 50, Ill.
See Advertisement on Page 23
American Phenolic Corp., 1800 5th Ave., Chicago 50, Ill.
See Advertisement on Page 23
American Phenolic Corp., 1800 5th Ave., Chicago 50, Ill.
See Advertisement on Page 23
American Phenolic Corp., 1800 5th Ave., Chicago 50, Ill.
See Advertisement on Page 23
American Phenolic Corp., 1800 5th Ave., Chicago 50, Ill.
ELECTRONIC and ALLIED PRODUCTS


Aerelastic Electronic Hardware Corp., 24 Cliff St., Jersey City, N. J.

Aerelastic Electronic Hardware Corp., 24 Cliff St., Jersey City, N. J.

Puget Sound Co., C. J., 720 N. 14th St., Seattle, Wash.

Raytheon Electronic Co., 133 South St., New York 7, N. Y.

Pan American Airways, 400 Pearl St., New York 17, N. Y.

Points—Contact

Brainin Co., C. S., 233 Spring St., New York 13, N. Y.


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Baldwin, A. H., 54 Park Pl., New York 17, N. Y.

Powders—Polishing

Lindley Chemical Co., 29 E. Madison St., Chicago 2, Ill.

POWER PACKS

Airpax Products Co., P. O. Box 6766, Baltimore 4, Maryland

American Television & Radio Co., 311 E. Garfield Ave., Glendale, Calif.


Amplidyne Electronic Co., 304 Broadway, New York 15, N. Y.

Points—Contact

Brainin Co., C. S., 233 Spring St., New York 13, N. Y.


See Advertisements on Page 256


Baldwin, A. H., 54 Park Pl., New York 17, N. Y.

Powders—Polishing

Lindley Chemical Co., 29 E. Madison St., Chicago 2, Ill.

POWER PACKS

Airpax Products Co., P. O. Box 6766, Baltimore 4, Maryland

American Television & Radio Co., 311 E. Garfield Ave., Glendale, Calif.


Amplidyne Electronic Co., 304 Broadway, New York 15, N. Y.
POWER PACKS

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ELECTRONIC and ALLIED PRODUCTS

Superior Electric Co., 83 Laurel St., Bristol, Conn.
See Advertisements on Pages 5 to 16


Thermionic Engineering Corp., Pomptain Plains, N. J.

Transmitter Equipment Co., Inc., 345 Hudson St., New York, N. Y.

Universal Transformer Corp., 158 Varick St., New York, N. Y.

See Advertisement on Page 22

Ward Leonard Electric Co., 31 South St., Newark, N. J.

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Weymouth Instrument Co., 1410 Commercial St., East Weymouth, Mass.

PRE-AMPLIFIERS for COMMUNICATION RECEIVERS

American Communications Corp., 306 Madison Ave., New York, N. Y.

Barone Co. S. A., 145 W. 22nd St., New York, N. Y.

Eckstein Radio & Television Co., 914 LaSalle Ave., Minneapolis 3, Minn.


McMurdo Silver Co., Inc., 1748 Main St., Hartford, Conn.


See Advertisement on Page 44

Pan American Electric Co., Inc., 321 Atwater St., Brooklyn 7, N. Y.

Stark Sound Engineering Co., P. 0. Box 493, Atlantic Ave., Brooklyn 7, N. Y.


PRE-SELECTORS

American Radio Co., 611 E. Garfield Ave., Glendale, Calif.


See Advertisement on Page 44


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S-W Industries, Inc., 1956 N. Wood St., Chicago, Ill.

PRESSES—Hydraulic Molding

Hydraulic Press Mfg Co., Mt. Gilead, Ohio


PROBES

Barber Labs., A. W., 34-34 Francis Lewis Blvd., Flushing, N. Y.

Devinthorn Engineering Co., Inc., The, 1818 Ashland St., Houston 8, Texas

Kartron Inc., 331A South 4th St., Allhamra, Calif.

Keystone Electronics Co., 59-52 Franklin St., New York 13, N. Y.

Radio City Products, 127 W. 26th St., New York, N. Y.

Production Tube Testing Equipment

Buck Engineering Co., 37-41 Marcy St., Freehold, N. J.

See Advertisement on Page 22

Chatham Electronics, 475 Washington St., Newark 2, N. J.

Electrophant Mfg. Co., 49 Fredericks St., Brooklyn 27, N. Y.

Electronic Apparatus, Inc., 345 Madison Ave., New York 17, N. Y.

Electronic Controls, Inc., 44 Summer Ave., Newark 8, N. J.

Radio City Products, 127 W. 26th St., New York, N. Y.

Radio Corp. of America, Tube Div., Harrison, N. J.

Heiner Eletronics Co., 152 W. 25th St., New York, N. Y.

Sherrill Engineering Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

Weston Electrical Instrument Co., 618 Preble Ave., Newark 5, N. J.

PROTECTIVE SEALERS

See Insulating Compounds

PYROMETERS and POTENTIOMETER PYROMETERS

Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 1, Ohio

Bristol Co., The, Waterbury 5, Conn.

Brookfield Engineering Corp., 1415 S. Michigan Ave., Chicago 46, Ill.

Eastern Electric Equipment Co., 331 Canal St., Newark 5, N. J.


Foxxboro Co., Foxboro, Mass.

General Electric Co., 191 Hazel St., Paterson, N. J.

Gorton Co., Claude S., 3900 S. Wallace St., Chicago 16, Ill.

Illinois Testing Labs., Inc., 420 N. LaSalle St., Chicago 11, Ill.

J B T Instruments, Inc., 441 Chapel St., New Haven 9, Conn.


Lewie Engineering Co., 52 Rubber Ave., Naugatuck, Conn.

Meters, Inc., 815 Riverside Dr., Indianapolis 5, Ind.


Pyrometer Instrument Co., 193 Lafayette St., New York, N. Y.


Taubman Div., C. J. Portable Products Corp., 950 Park Ave., Brooklyn 23, N. Y.


Wheaton Instrument Co., 846 W. Harrison St., Chicago 7, Ill.

Winslow Co., 5 Liberty St., Newark 5, N. J.

QUARTZ—Unfinished Crystals

American Gem & Pearl Co., 6 West 48th St., New York 19, N. Y.

Cadie Chemical Products, Inc., 621 Sixth Ave., New York, N. Y.

Commercial Equipment Co., 1416 McGee St., Kansas City, Mo.

Cryotronics Research, Inc., 25 Allyn St., Hartford, Conn.

Dahoon Labs., 2520 Santa Monica Blvd., Los Angeles, Calif.

Eldon Electronic Co., 1802 N. Third St., Temple, Texas

Monitor Products Co., 815 Fremont St., So. Pasadena, Calif.

Nebel Lab., 8 E., 1104 Lincoln Pkwy., Brookl

Premier Crystal Labs., Inc., 63 Park Row, New York 7, N. Y.

Reeves-Hoffman Co., 215 E. 91st St., New York 28, N. Y.

RACKS—Relay

Art-Joy Metal Products Corp., 2973 Cropper Ave., Brooklyn 14, N. Y.

See Advertisement on Page 236

Audio Products Co., 2301 W. Olive Ave., Burbank, Calif.

Autoell Co., The, Shelby, Ohio

Automatic Electric Co., 1633 W. Van Buren St., Chicago 7, Illinois


Dahlon's Metal Door Co., Jamestown, N. Y.

Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.

See Advertisement on Page 196

Insuline Corp. of America, 36-02 35th Ave., Woodside, N. Y.

See Advertisement on Page 166

Johnston Co., E. F., Waseca, Minn.

Radio & Hydraulics

Radio & Medical Lab., Inc.

Radio & Electronics...
**ELECTRONIC AND ALLIED PRODUCTS**

**RECEIVERS**

**a-m Fixed Frequency**

**Aero Communications, Inc.**, 231 Main St., Hempstead, N. Y.

**Amemiya Communications Corp.**, 306 Broadway, New York 7, N. Y.

**Broco Electronics Corp.**, 55 Vandam St., New York, N. Y.

**Collins Radio Co., Cedar Rapids, Iowa**

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**Eckstein Radio & Television Co.**, 914 Pineapple St., Minneapolis 2, Minn.

**Erco, Radio Labs. Inc.,** Fenimore Ave., Brooklyn 1, N. Y.

**Garod Radio Corp.,** 70 Washington St., Brooklyn 39, N. Y.

**Hammurad Mfg. Co.,** 460 W. 34th St., New York 18, N. Y.

**Harvey Wells Electronics Inc.,** North St., Greenfield, Mass.

**Herbach & Rademan Inc.,** 914 Cedar Ave., Minneapolis 2, Minn.

**Hoffman Radio Corp.,** 3430 S. Hill St., Los Angeles 7, Calif.

**Iggy Radio Corp.,** 950 N. 11th St., Sacramento, Calif.

**Kaar, Engineering Co.,** 619 Emerson St., Palo Alto, Calif.

**Kennedy Manufacturing & Supply Co.,** 6500 S. Cicero Ave., Chicago 33, Ill.

**Link, Fred M.,** 125 W. 17th St., New York 11, N. Y.

**McMurdo Silver Co.,** 1249 Main St., Hartford, Conn.


**National Co.,**, 61 Sherman St., Malden 18, Mass.

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**National Co.,**, 61 Sherman St., Malden 18, Mass.

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**Press, Mr. W.,** Broadway, New York 18, N. Y.

**Radio Corp. of America, RCA Victor Div.,** Camden, N. J.

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**Seale Electric Ind., Inc.,** Orange, Calif.

**Sonora Radio & Television Corp.,** 325 N. Cicero Ave., Chicago 38, Ill.

**Technical Devices Corp.,** 851 Madison Ave., New York 28, N. Y.

**Ward, W.**, 819 9th St., Oakland, Calif.

See Advertisement on Page 10

**Wireless Mfg. Corp.,** 1475 Broadway, New York 18, N. Y.

**Radio Corp. of America, RCA Victor Div.,** Camden, N. J.

**Radio Development & Research Co.,** 36 Broadway, New York 7, N. Y.


**Radio Engineers Inc.,** Pasadena, Calif.

**Radio Receptor Co.,** 251 W. 19th St., New York 11, N. Y.

See Advertisement on Page 10

**Radio Spectro Mfg. Corp.,** 65 1st Ave., Portland 14, Oregon

**Sargent,** 2109 Ninth St., Oakland, Calif.

**Technical Devices Corp.,** 819 9th St., Oakland, Calif.

**Ward, W.**, 819 9th St., Oakland, Calif.

**Ward, W.**, 819 9th St., Oakland, Calif.

**Ward, W.**, 819 9th St., Oakland, Calif.

See Advertisement on Page 166

**LaBarge Engineering Co.,** 120 Greenwich St., New York 38, N. Y.

**Tappan Electronics, Inc.,** 120 Greenwich St., New York 38, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.

**Tappan Radio & Electric Co.,** 391 W. 34th St., New York 10, N. Y.
Western Electric Co., Inc., 195 Broadway, New York 6, N. Y.

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RECEIVERS—Loran

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RECEIVERS—Marine
Aero Communications, Inc., 231 Main St., Hemstead, N. Y.

Bassett Inc., 500 SE 2nd St., Ft. Lauderdale, Fla.

Communications Co., Inc., 300 Gree Ave., Coral Gables 34, Fla.

Dine and Co., Inc., 2221 Warwick Ave., Santa Monica, Calif.

Deolittle Radio Inc., 7421 S. Loomis Blvd., Chicago 19, Ill.

Ekco Radio & Television Co., 914 Irving Park Blvd., Westfield, N. J.

Erco Radio & Television Co., 3100 N. Crystal Ave., Hemstead, N. Y.

Farnsworth Radio & Television Corp., Ft. Wayne, Ind.

Radio Corp. of America, RCA Victor Div., Cambridge, Mass.

General Electric Co., Syracuse, N. Y.

See Advertisements on Pages 86, 96A

Hallicrafters Co., 3410 W. 40th Ave., Chicago 11, Ill.

Hose-McCann Telephone Co., 177 South St., Brooklyn 2, N. Y.

Kear Edlund Co., 619 Emerson St., Palo Alto, Calif.

Lee-Ther Mfg. Co., 125 W. 17th St., New York 11, N. Y.

Moore Mfg. Co., 33 East Fourth St., Long Beach 2, Calif.

Radio Corp. of America, RCA Victor Div., Camden, N. J.

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RECEIVERS—Radio Direction Finder
Airplane & Marine Instruments, Inc., Clearfield, Utah

Bendix Radio Div., Bendix Aviation Corp., Baltimore 1, Md.

Collins Radio Co., Cedar Rapids, Iowa

See Advertisements on Pages 30 to 33

Electro-Communications, Inc., 61 Brighton Ave., Long Branch, N. J.

Fairchild Camera and Instrument Corp., 58th-66th St., Van Wyck Blvd., Jamaica 1, N. Y.

Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.

See Advertisements on Pages 48A to 48D

General Electric Co., Syracuse, N. Y.

See Advertisements on Pages 86, 96A

Gray Radio Co., 730 Okeechobee Blvd., Hialeah, Fla.

Hallicrafters Co., 4401 W. Fifth Ave., Chicago 34, Ill.

Harris Electronics Co., North St., Southbridge, Mass.

Hose-McCann Telephone Co., 177 Pacific St., Brooklyn 2, N. Y.

Hudson Radio Co., 25 W. 43rd St., New York 18, N. Y.

Jefferson-Travis Inc., 40 E. Merrick Rd., Freeport, N. Y.

Jefferson-Travis Inc., 380 Second Ave., New York 14, N. Y.

Kaar Engineering Co., 613 Emerson St., Palo Alto, Calif.


See Advertisement on Page 78

Northern Radio Co., 2208 Fourth Ave., Seattle, Wash.

Radio Development and Research Co., 26 Faraday Avenue, Jersey City, N. J.

Radiomatic Corp. of America, 75 Varick Street, New York 14, N. Y.

Radio Navigational Instrument Corp., 500 La Salle Ave., Minneapolis 2, Minn.

Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80B

Thompson Co., John E., 1440 W. Division St., Malden, Mass.

VHF-Converters Inc., 345 Hudson St., New York 14, N. Y.

Westinghouse Electric Corp., 1490 West 202nd St., H. N. Y.

Western Electric Co., Inc., 195 Broadway, New York 6, N. Y.

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Collins Radio Co., Cedar Rapids, Iowa

See Advertisements on Pages 30 to 33

Communications Co., Inc., 300 Gree Ave., Coral Gables 34, Fla.

Dine and Co., Inc., F. E., 2221 Warwick Ave., Santa Monica, Calif.

Deolittle Radio Inc., 7421 S. Loomis Blvd., Chicago 19, Ill.

Ekco Radio & Television Co., 914 Irving Park Blvd., Westfield, N. J.

Erco Radio & Television Co., 3100 N. Crystal Ave., Hemstead, N. Y.

Farnsworth Radio & Television Corp., Ft. Wayne, Ind.

Radio Corp. of America, RCA Victor Div., Camden, N. J.

See Advertisements on Inside Back Cover & Back Cover, 251


Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80B

Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.

Western Electric Co., Inc., 195 Broadway, New York 6, N. Y.

See Advertisements on Pages 48A, 48B

Collins Radio Co., Cedar Rapids, Iowa

See Advertisements on Pages 30 to 33

Electro-Communications, Inc., 61 Brighton Ave., Long Branch, N. J.

Fairchild Camera and Instrument Corp., 58th-66th St., Van Wyck Blvd., Jamaica 1, N. Y.

Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.

See Advertisements on Pages 48A to 48D

General Electric Co., Syracuse, N. Y.

See Advertisements on Pages 86, 96A

Gray Radio Co., 730 Okeechobee Blvd., Hialeah, Fla.

Hallicrafters Co., 4401 W. Fifth Ave., Chicago 34, Ill.

Hose-McCann Telephone Co., 177 Pacific St., Brooklyn 2, N. Y.

Jefferson-Travis Inc., 40 E. Merrick Rd., Freeport, N. Y.

Jefferson-Travis Inc., 380 Second Ave., New York 14, N. Y.

Kaar Engineering Co., 613 Emerson St., Palo Alto, Calif.


See Advertisement on Page 78

Northern Radio Co., 2208 Fourth Ave., Seattle, Wash.

Radio Development and Research Co., 26 Faraday Avenue, Jersey City, N. J.

Radiomatic Corp. of America, 75 Varick Street, New York 14, N. Y.

Radio Navigational Instrument Corp., 500 La Salle Ave., Minneapolis 2, Minn.

Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80B

Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.

Westinghouse Electric Corp., Industrial Electronics Div., Baltimore, Md.

RECEIVERS—Microwave
Bendix Radio Div., Bendix Aviation Corp., Baltimore 1, Md.

De Menery, Ray Inc., 475 Grand Concourse, New York 31, N. Y.

Doeney, Ray Inc., 475 Grand Concourse, New York 31, N. Y.

See Advertisements on Page 171

Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.

See Advertisement on Pages 48A to 48D

Radar Engineers, 4094 Arcade Bldg., Seattle 1, Wash.

Radio Corp. of America, RCA Victor Div., Camden, N. J.

See Advertisements on Inside Back Cover & Back Cover, 251

Raytron, Inc., 724 Jackson Street, Jackson, Mich.

Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80B

Television Products Co., 656 W. Irving Park Rd., Chicago 34, Ill.

RECEIVERS—Panoramic
Hallicrafters Co., 4401 W. Fifth Ave., Chicago 34, Ill.

Panoramic Radio Corp., 242 W. 55th St., New York 19, N. Y.

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Northern Radio Co., 2208 Fourth Ave., Seattle, Wash.


Radio Corp. of America, RCA Victor Div., Camden, N. J.

See Advertisements on Inside Back Cover & Back Cover, 251

Raytron Labs., Industrial Blvd., Seattle 6, Wash.

Radio Navigational Instrument Corp., 500 Fifth Ave., New York 18, N. Y.

Sargent Co., E. M., 212 Ninth St., New York 10, N. Y.

Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisement on Page 80A

Weber Electronics Co., 195 Broadway, New York 7, N. Y.

RECEIVERS—Railroad
Airplane & Marine Instruments, Inc., Clearfield, Pa.


Collins Radio Co., Cedar Rapids, Iowa

See Advertisements on Pages 30 to 33

Communications Co., Inc., 300 Gree Ave., Coral Gables 34, Fla.

Dine and Co., Inc., F. E., 2221 Warwick Ave., Santa Monica, Calif.

Deolittle Radio Inc., 7421 S. Loomis Blvd., Chicago 19, Ill.

Ekco Radio & Television Co., 914 Irving Park Blvd., Westfield, N. J.

Erco Radio & Television Co., 3100 N. Crystal Ave., Hemstead, N. Y.

Farnsworth Radio & Television Corp., Ft. Wayne, Ind.

Radio Corp. of America, RCA Victor Div., Camden, N. J.

See Advertisements on Inside Back Cover & Back Cover, 251

Radio Development and Research Co., 26 Wall St., Jersey City, N. J.


Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80B

Western Electric Co., Inc., 195 Broadway, New York 6, N. Y.

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ELECTRONIC and ALLIED PRODUCTS

RECEIVERS

A. R. F. Products, 7713 Lake St., River Forest, Ill.
Admiral Corp., 3380 W. Cortland St., Chicago, Ill.
American Electronics, 37 E. 18th St., New York, N. Y.
Analex Radio Corp., 41 J. S. Aves, Tren- ton 9, N. J.
Bittmore Radio Corp., 15 A. Ave, New York, N. Y.
Brook Electronics, Inc., Elizabeth, N. J.
Colonial Radio Corp., 254 Rano St., Buffalo, N. Y.
Crosley Corp., 1329 Arlington St., Cincinnati, Ohio.
Crossley, Inc., 61 Duke St., New York, N. Y.
Eclampsea, Div. of Hallcrafters Co., 4401 W. Fifth Ave., Chicago, Ill.
Electrophone Radio & Television Co., 5712 S. Western Ave., Chicago, Ill.
Fana Radio & Electric Co., 38-28 Thomson Ave., Sunnyside, Queens, N. Y.
Farnsworth Television & Radio Corp., 3700 W. Division St., Chicago, Ill.
Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.
See Advertisements on Pages 48A to 48D

A. R. F. Products

RECEIVERS, HOME—2-M Hz

A. R. F. Products, 7713 Lake St., River Forest, Ill.
Admiral Corp., 3380 W. Cortland St., Chicago, Ill.
American Electronics, 37 E. 18th St., New York, N. Y.
Analex Radio Corp., 41 J. S. Aves, Tren- ton 9, N. J.
Bittmore Radio Corp., 15 A. Ave, New York, N. Y.
Brook Electronics, Inc., Elizabeth, N. J.
Colonial Radio Corp., 254 Rano St., Buffalo, N. Y.
Crosley Corp., 1329 Arlington St., Cincinnati, Ohio.
Crossley, Inc., 61 Duke St., New York, N. Y.
Eclampsea, Div. of Hallcrafters Co., 4401 W. Fifth Ave., Chicago, Ill.
Electrophone Radio & Television Co., 5712 S. Western Ave., Chicago, Ill.
Fana Radio & Electric Co., 38-28 Thomson Ave., Sunnyside, Queens, N. Y.
Farnsworth Television & Radio Corp., 3700 W. Division St., Chicago, Ill.
Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.
See Advertisements on Pages 48A to 48D

Federal Telephone and Radio Corp.

RECEIVERS, HOME—4-M Hz

A. R. F. Products, 7713 Lake St., River Forest, Ill.
Admiral Corp., 3380 W. Cortland St., Chicago, Ill.
American Electronics, 37 E. 18th St., New York, N. Y.
Analex Radio Corp., 41 J. S. Aves, Tren- ton 9, N. J.
Bittmore Radio Corp., 15 A. Ave, New York, N. Y.
Brook Electronics, Inc., Elizabeth, N. J.
Colonial Radio Corp., 254 Rano St., Buffalo, N. Y.
Crosley Corp., 1329 Arlington St., Cincinnati, Ohio.
Crossley, Inc., 61 Duke St., New York, N. Y.
Eclampsea, Div. of Hallcrafters Co., 4401 W. Fifth Ave., Chicago, Ill.
Electrophone Radio & Television Co., 5712 S. Western Ave., Chicago, Ill.
Fana Radio & Electric Co., 38-28 Thomson Ave., Sunnyside, Queens, N. Y.
Farnsworth Television & Radio Corp., 3700 W. Division St., Chicago, Ill.
Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.


Radio Electronic Products
Radio Corp. of America,
See Advertisements
Metropolitan Electronic
Magnavox Co., The,
Garod Radio Corp.,
See Advertisements
Admiral Corp., 2800
Electronic
Belmont Radio Co.,
A. R. F. Products,
RECEIVERS, HOME—fm Consoles
Admiral Corp., 3800 Cortland St., Chicago
Air-King Products Co., Inc., 1523 63rd St.,
Belmont Radio Co., Div. Raytheon Mfg Co.,
Raytheon Mfg Co., Power Tube Div.,
Sentinel Radio Corp., 851 Madison Ave., New York
Zenith Radio Corp., 6001 Dickens Ave.,
Ilinois
Electronics Buyer's Guide
1947-1948

RECEIVERS, HOME—fm Vast Pockets
Metropolitan Electronic & Instrument Co.,
Six Murray St., New York 11, N. Y.
Raytheon Mfg Co., Power Tube Div.,
Waltham 54, Mass.

RECEIVERS, HOME—Built-in Wall Type
American Communications Corp., 306 Broadway,
New York 7, N. Y.
Anasley Radio Corp., 41 St. Jones Ave.,
Trenton, N. J.
DeWalt Radio Mfg Co., 35-15 37th Ave.,
Woodside, N. Y.
Electronic Enterprises, Inc., 1314 Forest
Ave., Dallas 16, Texas
Flush Wall Radio Co., 15 Washington St.,
Waltham 54, Mass.
Measurements Engineering Co., 61 Duke St.,
Toronto, Canada
See Advertisements on Page 193
Rensler Co., Ltd., 3011 Bryant St., San Francisco 6, Calif.
Smith-Keeler Engineering Co., 125Marlay
St., New York 7, N. Y.

RECEIVERS, HOME—Recorders & Phonograph Combos
Airadio Inc., Melrose Ave. & Battery Pl.,
Stamford, Conn.
Air-King Products Co., Inc., 1523 63rd St.,
Brooklyn, N. Y.
Andrea Radio Corp., 43-30 34th St., Long
Island City, N. Y.
Andes Radio Corp., 41 St. Jones Ave.,
Trenton, N. J.
Andler Radio Co., Inc.,
Automatic Radio Mfg Co., Inc., 122 Brook-
Ave., Brooklyn 1, N. Y.
Belmont Radio Co., Div. Raytheon Mfg Co.,
Raytheon Mfg Co., Power Tube Div.,
Waltham 54, Mass.
Sentinel Radio Corp., 851 Madison Ave.,
Evansville, Ind.
Zenith Radio Corp., 6001 Dickens Ave.,
Chicago, III.

RECEIVERS, HOME—fm Portable Radios
Air-King Products Co., Inc., 1523 63rd St.,
Belmont Radio Co., Div. Raytheon Mfg Co.,
Enstrom Radio & Phonograph Co.,
American Communications Corp., 306 Broadway,
New York 7, N. Y.
Belmont Radio Co., Div. Raytheon Mfg Co.,
Foreman Electronics Inc., 958 South Spring St.,
Belmont Radio Co., Div. Raytheon Mfg Co.,
Raytheon Mfg Co., Power Tube Div.,
Biltmore Radio Corp., 15 Ave. of the Americas,
New York 11, N. Y.
Caivert Motors Associates, Ltd., 565 Morse
St., N. E., Washington 2, D. C.
Colin Radio Products Co., 61 Duke St.,
Westfield, N. J.
See Advertisements on Page 252
Colopial Radio Corp., 254 Rano St., Buffalo
Conn Ltd., C. G., Elkhart, Ind.
Emerson Radio & Phonograph Corp.,
111 N. Los Angeles St., Los Angeles 2, Calif.
Favorite Mfg Co., 108 E. 1:2th St., New York 2, N. Y.
Garod Radio Corp., 70 Washington St.,
Brooklyn 1, N. Y.
Garod Radio Corp., 70 Washington St.,
Brooklyn 1, N. Y.
Hallirafers Co., 4401 W. Fifth Ave.,
Cleveland 6, Ohio
Hoffman Radio Co., 3430 S. Hill St.,
Los Angeles 7, Calif.
Maguire Industries, Inc., 958 South Spring St.,
Wayne 4, Ind.
Mahan Inc., 79 Thurman Ave.,
Brooklyn 1, N. Y.
Melser Mfg Div., Maguire Industries, Inc.,
New York 11, N. Y.
Metropolitan Electronic & Instrument Co.,
6 Murray St., New York 11, N. Y.
Metropolitan Electronic & Instrument Co.,
5 Murray St., New York 6, N. Y.
Moxa Vie Co., 32 Indiana Ave., New York
Motorola Radio, Mfg Co.,
Metal Electronic & Instrument Co.,
Murray Mfg Co., Power Tube Div.,
Metropolitan Electronic & Instrument Co.,
Metro Aluminum & Engineering Co.,
235W. 21st St., Los Angeles 6, Calif.
Moxa Vie Co., 32 Indiana Ave., New York
Motorola Radio, Mfg Co.,
4545 Augusta Blvd., Chicago, III.

RECEIVERS, HOME—fm Table Models
A. R. F. Products, 7713 Lake St.,
River Forest, Ill.
Admiral Corp., 3800 Cortland St., Chicago
American Communications Corp., 306 Broadway,
New York 7, N. Y.
Belmont Radio Co., Div. Raytheon Mfg Co.,
Raytheon Mfg Co., Power Tube Div.,
Sentinel Radio Corp., 851 Madison Ave.,
Chicago, III.

RECEIVERS, HOME—Built-in Wall Type
American Communications Corp., 306 Broadway,
New York 7, N. Y.
Anasley Radio Corp., 41 St. Jones Ave.,
Trenton, N. J.
DeWalt Radio Mfg Co., 35-15 37th Ave.,
Woodside, N. Y.
Electronic Enterprises, Inc., 1314 Forest
Ave., Dallas 16, Texas
Flush Wall Radio Co., 15 Washington St.,
Waltham 54, Mass.
Measurements Engineering Co., 61 Duke St.,
Toronto, Can.
See Advertisements on Page 193
Rensler Co., Ltd., 3011 Bryant St., San Francisco 6, Calif.
Smith-Keeler Engineering Co., 125Marlay
St., New York 7, N. Y.

RECEIVERS, HOME—Recorders & Phonograph Combos
Airadio Inc., Melrose Ave. & Battery Pl.,
Stamford, Conn.
Air-King Products Co., Inc., 1523 63rd St.,
Brooklyn, N. Y.
Andrea Radio Corp., 43-30 34th St., Long
Island City, N. Y.
Andes Radio Corp., 41 St. Jones Ave.,
Trenton, N. J.
Andler Radio Co., Inc.,
Automatic Radio Mfg Co., Inc., 122 Brook-
Ave., Brooklyn 1, N. Y.
Belmont Radio Co., Div. Raytheon Mfg Co.,
Raytheon Mfg Co., Power Tube Div.,
Biltmore Radio Corp., 15 Ave. of the Americas,
New York 11, N. Y.
Caivert Motors Associates, Ltd., 565 Morse
St., N. E., Washington 2, D. C.
Colin Radio Products Co., 61 Duke St.,
Westfield, N. J.
See Advertisements on Page 252
Colopial Radio Corp., 254 Rano St., Buffalo
Conn Ltd., C. G., Elkhart, Ind.
Emerson Radio & Phonograph Corp.,
111 N. Los Angeles St., Los Angeles 2, Calif.
Favorite Mfg Co., 108 E. 1:2th St., New York 2, N. Y.
Garod Radio Corp., 70 Washington St.,
Brooklyn 1, N. Y.
Garod Radio Corp., 70 Washington St.,
Brooklyn 1, N. Y.
Hallirafers Co., 4401 W. Fifth Ave.,
Cleveland 6, Ohio
Hoffman Radio Co., 3430 S. Hill St.,
Los Angeles 7, Calif.
Maguire Industries, Inc., 958 South Spring St.,
Wayne 4, Ind.
Mahan Inc., 79 Thurman Ave.,
Brooklyn 1, N. Y.
Melser Mfg Div., Maguire Industries, Inc.,
New York 11, N. Y.
Metropolitan Electronic & Instrument Co.,
6 Murray St., New York 11, N. Y.
Metropolitan Electronic & Instrument Co.,
5 Murray St., New York 6, N. Y.
Moxa Vie Co., 32 Indiana Ave., New York
Motorola Radio, Mfg Co.,
4545 Augusta Blvd., Chicago, III.

RECEIVERS, HOME—Built-in Wall Type
American Communications Corp., 306 Broadway,
New York 7, N. Y.
Anasley Radio Corp., 41 St. Jones Ave.,
Trenton, N. J.
DeWalt Radio Mfg Co., 35-15 37th Ave.,
Woodside, N. Y.
Electronic Enterprises, Inc., 1314 Forest
Ave., Dallas 16, Texas
Flush Wall Radio Co., 15 Washington St.,
Waltham 54, Mass.
Measurements Engineering Co., 61 Duke St.,
Toronto, Can.
See Advertisements on Page 193
Rensler Co., Ltd., 3011 Bryant St., San Francisco 6, Calif.
Smith-Keeler Engineering Co., 125Marlay
St., New York 7, N. Y.
ELECTRONIC and ALLIED PRODUCTS

RECORDERS — Electronic Self-Balancing Recorders and Indicators

Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio
Foxboro Co., Foxboro, Mass.
Instrumental Instruments Inc., 1710 Pollock Ave., Jersey City 5, N. J.
Electronic Scale Labs, 26 Howard St., Philadelphia, Pa.
Miles Reproducer Co., Inc., 812 Broadway, New York 13, N. Y.

RECORDERS — Sound and Phonograph

Allied Recording Products Co., 21-09 43rd Ave., Long Island City 1, N. Y.
See Advertisement on Page 243
Auda Co., 500 Fifth Ave., New York, N. Y.
Audre, Inc., Above, S. 7th St., New York 3, N. Y.
Harwell & McAllister, 6736 Santa Monica Blvd., Hollywood, Calif.
Bell & Howell, 1183 Essex Ave., Columbus, Ohio
Colonial Radio Corp., 254 Rano St., Buffalo, N. Y.
Curtis, C. G., Elkart, Ind.
Cook Laboratories, 139 Gordon Blvd., Floral Park, N. Y.
Dictaphone Corp., 420 Lexington Ave., New York 7, N. Y.

RECORDERS — Electronic Office Recorders & Playbacks

Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio
First Electronics, 800 W. North Ave., Chicago 22, Ill.
See Advertisement on Page 248

RECORDERS — Dielectric Constant

Tech Labs, 337 Central Ave., Jersey City, N. J.

RECORDERS — Electronic Office Recorders & Playbacks

Dictaphone Corp., 420 Lexington Ave., New York 7, N. Y.
Edison Inc., Thomas A., 51 Lakeside Ave., Newark, N. J.
Ellinwood Industries, 150 W. Slauson Ave., Los Angeles 3, Calif.
Electronic Chemical Engineering Co., 1233 16th St., Los Angeles, Calif.
Miles Reproducer Co., Inc., 812 Broadway, New York 13, N. Y.

RECORDERS — Frequency

Consolidated Engineering Corp., 935 E. 30th St., Pasadena, Calif.
Potter Instrument Co., 136-46 Roosevelt Ave., Flushing, N. Y.
See Advertisement on Page 243

RECORDERS — Mechancal

Annis Co., B. R., 1191 N. Delaware St., Indianapolis, Ind.
Autocell Co., The, Shelby, Ohio
Hornbach & Rademan Inc., 517 Ludlow St., Philadelphia 6, Pa.
Miles Reproducer Co., Inc., 812 Broadway, New York 3, N. Y.

RECORDERS — Oxygen

Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio

RECORDERS — Potentiometer

Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio
Foxboro Co., Foxboro, Mass.
Miles Reproducer Co., Inc., 812 Broadway, New York 3, N. Y.

RECORDERS — Sound and Phonograph

Allied Recording Products Co., 21-09 43rd Ave., Long Island City 1, N. Y.
See Advertisement on Page 243
Auda Co., 500 Fifth Ave., New York, N. Y.
Audre, Inc., Above, S. 7th St., New York 3, N. Y.
Harwell & McAllister, 6736 Santa Monica Blvd., Hollywood, Calif.
Bell & Howell, 1183 Essex Ave., Columbus, Ohio
Colonial Radio Corp., 254 Rano St., Buffalo, N. Y.
Curtis, C. G., Elkart, Ind.
Cook Laboratories, 139 Gordon Blvd., Floral Park, N. Y.
Dictaphone Corp., 420 Lexington Ave., New York 7, N. Y.

RECORDERS — Electronic Self-Balancing Recorders and Indicators

Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio
Foxboro Co., Foxboro, Mass.
Instrumental Instruments Inc., 1710 Pollock Ave., Jersey City 5, N. J.
Electronic Scale Labs, 26 Howard St., Philadelphia, Pa.

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Leach Relay Co., Inc., 5915 Avalon Blvd., Los Angeles 3, Calif.  
See Advertisement on Page 59  
Belgian Electric Mfg. Co., 154 W. 14th St., New York 13, N. Y.  
See Advertisement on Page 354
See Advertisement on Page 354
Westinghouse Electric Corp., Meter Div., Newark, N. J.

RELAYS—Industrial Control
Adams & Westlake Co., Michigan St., Elk-hart, Ind.  
Advance Electric & Relay Co., 1260 W. Second St., Los Angeles, Calif.  
Allied Control Co., Inc., 2 East End Ave., New York 21, N. Y.  
See Advertisement on Page 221  
Brallier Manufacturing Co., Inc., 617 N. Gibson St., Princeton, Ind.  
Phillips Electrical Co., 154 W. 14th St., New York 13, N. Y.  
See Advertisement on Page 175
Leach Relay Co., Inc., 5915 Avalon Blvd., Los Angeles 3, Calif.  
See Advertisement on Page 59  
Belgian Electric Mfg. Co., 154 W. 14th St., New York 13, N. Y.  
See Advertisement on Page 354
See Advertisement on Page 354
Westinghouse Electric Corp., Meter Div., Newark, N. J.

RELAYS—Instrument
Assembly Products, Inc., Chagrin Falls, Ohio  
Baker Instrument Co., 310 Main St., Orange, N. J.  
Clarostat Mfg. Co., Inc., 84-5 6th St., Newark, N. J.  
Fisher-Pierce Co., 70 Ceylon St., Boston 21, Mass.  
See Advertisement on Page 162  
Leach Relay Co., Inc., 5915 Avalon Blvd., Los Angeles 3, Calif.  
North Electric Mfg. Co., 501 S. Market St., Galion, Ohio  
See Advertisement on Page 221
See Advertisement on Page 175
Ward Leonard Electric Co., 31 South St., Mt. Vernon, N. Y.  
See Advertisement on Page 175

RELAYS—Latching
Advance Electric & Relay Co., 1260 W. Second St., Los Angeles, Calif.  
Allied Control Co., Inc., 2 East End Ave., New York 21, N. Y.  
See Advertisement on Page 221  
AutoCall Co., The, Shelby, Ohio  
Allied Control Co., Inc., 41 E. 11th St., New York 3, N. Y.  
Control Corp., 37 S. Central Ave., Minneapol-is 14, Minn.  
Cook Electric Co., 2700 Southport Ave., Chicago 31, Ill.  
Grayhill Corp. 1 N. Pulaski Rd., Chicago 14, Ill.  
Leach Relay Co., Inc., 5915 Avalon Blvd., Los Angeles 3, Calif.  
North Electric Mfg. Co., 501 S. Market St., Galion, Ohio  
Price Electric Corp., East Coast and 2nd Stats., Frederick, Md.  
Sigma Instruments, Inc., 70 Ceylon St., Boston 22, Mass.  
See Advertisement on Page 59  
Signal Engineering & Mfg. Co., 154 W. 14th St., New York 13, N. Y.  
See Advertisement on Page 354
Standard Electrical Products Co., Dayton 3, Ohio  
See Advertisement on Page 175
Ward Leonard Electric Co., 31 South St., Mt. Vernon, N. Y.  
See Advertisement on Page 175

RELAYS—Mercury
Adams & Westlake Co., Michigan St., Elkhart, Ind.  
AutoCall Co., The, Shelby, Ohio  
Brown Instrument Co., Inc., 1010 N. Gibson St., Princeton, Ind.  
Chatham Electric, 475 Washington St., Newark, N. J.  
Leach Relay Co., Inc., 5915 Avalon Blvd., Los Angeles 3, Calif.  
Selens Devices, Inc., 70 Ceylon St., Boston 21, Mass.  
See Advertisement on Page 59  
Belgian Electric Mfg. Co., 154 W. 14th St., New York 13, N. Y.  
See Advertisement on Page 354
See Advertisement on Page 175
Ward Leonard Electric Co., 31 South St., Mt. Vernon, N. Y.  
See Advertisement on Page 175

Hernsaael Co., Riverside Dr., Elkhart, Ind.  
See Advertisement on Pages 99, 222  
North Electric Mfg. Co., 601 S. Market St., Galion, Ohio  
See Advertisement on Page 175
Sigma Instruments, Inc., 70 Ceylon St., Boston 22, Mass.  
See Advertisement on Page 354  
Standard Electrical Products Co., Dayton 3, Ohio  
See Advertisement on Page 175
Ward Leonard Electric Co., 31 South St., Mt. Vernon, N. Y.  
See Advertisement on Page 175

RELAYS—Multi-Contact
Advance Electric & Relay Co., 1260 W. Second St., Los Angeles, Calif.  
Allied Control Co., Inc., 2 East End Ave., New York 21, N. Y.  
See Advertisement on Page 221  
Auth Electric Specialty Co., 422 E. 33rd St., New York 17, N. Y.  
Clare & Co., C. F., 4719 Sunnyside Ave., Chicago 31, Ill.  
General Electric Co., Schenectady 5, N. Y.  
See Advertisement on Pages 96B, 96C  
Minneapolis-Honeywell Regulator Co., 2734 Fourth Ave., Minneapolis, Minn.  
Pratt Electric Corp., East Coast and 2nd Sts., Frederick, Md.  
Sigma Instruments, Inc., 70 Ceylon St., Boston 22, Mass.  
See Advertisement on Page 354
Sigma Engineering & Mfg. Co., 154 W. 14th St., New York 13, N. Y.  
See Advertisement on Page 354
Standard Electrical Products Co., Dayton 3, Ohio  
Ward Leonard Electric Co., 31 South St., Mt. Vernon, N. Y.  
See Advertisement on Page 175
Westinghouse Electric Corp., Meter Div., Newark, N. J.

RELAYS—Overload and Underload
Adams & Westlake Co., Michigan St., Elkhart, Ind.  
Advance Electric & Relay Co., 1260 W. Second St., Los Angeles, Calif.  
Allied Control Co., Inc., 2 East End Ave., New York 21, N. Y.  
See Advertisement on Page 221  
Bartle Co., The, 968 Farmington Ave., West Hartford, Conn.  
Clarke Electric Co., 1146 E. 152nd St., Cleveland 16, Ohio  
Cutler-Hammer, Inc., 315 N. 12th St., Milwaukeee 1, Wis.  
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.  
See Advertisement on Page 18  
Fisher-Pierce Co., 70 Ceylon St., Boston 21, Mass.  
See Advertisement on Page 165
General Electric Co., Schenectady 5, N. Y.  
See Advertisement on Pages 96B, 96C  
Minneapolis-Honeywell Regulator Co., 2734 Fourth Ave., Minneapolis, Minn.  
Pratt Electric Corp., East Coast and 2nd Sts., Frederick, Md.  
Sigma Instruments, Inc., 70 Ceylon St., Boston 22, Mass.  
See Advertisement on Page 354
Standard Electrical Products Co., Dayton 3, Ohio  
Ward Leonard Electric Co., 31 South St., Mt. Vernon, N. Y.  
See Advertisement on Page 175
Westinghouse Electric Corp., Meter Div., Newark, N. J.

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ELECTRONIC and ALLIED PRODUCTS

**RELAYS—Photocell**

Advance Electric & Relay Co., 1260 W. Lake St., Chicago 22, III.

Allied Control Co., Inc., 2 East End Ave., New York 22, N. Y.

See Advertisement on Page 221

*See Advertisement on Page 219*

**RELAYS—Plate Circuit**

Adams & Westlake Co., Michigan St., Elkom, Ind.

Advance Electric & Relay Co., 1260 W. Lake St., Chicago 22, III.

Allied Control Co., Inc., 2 East End Ave., New York 22, N. Y.

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*See Advertisement on Page 219*

**RELAYS—Power**

Adams & Westlake Co., Michigan St., Elkom, Ind.

Advance Electric & Relay Co., 1260 W. Lake St., Chicago 22, III.

Allied Control Co., Inc., 2 East End Ave., New York 22, N. Y.

See Advertisement on Page 221

*See Advertisement on Page 219*

**RELAYS—Plate Circuit**

Adams & Westlake Co., Michigan St., Elkom, Ind.

Advance Electric & Relay Co., 1260 W. Lake St., Chicago 22, III.

Allied Control Co., Inc., 2 East End Ave., New York 22, N. Y.

See Advertisement on Page 221

*See Advertisement on Page 219*
RESISTORS—Hermetically Sealed
Daven Co., 191 Central Ave., Newark 4, N. J.

RESISTORS—High Mogehm
Ohio Carbon Co., 12586 Berea Rd., Cleveland, Ohio

RESISTORS—Precision

RESISTORS—Wire Wound

RESISTORS—Temperature Sensitive
Globar Division, The Carbonbund Company, Niagara Falls, N. Y.

RESISTORS—Voltage Sensitive
General Electric Company, Schenectady, N. Y.
TIONS and ALLIED PRODUCTS

Mfg. Corp., 2335 W. Van Buren St., Chicago, Ill. See Advertisement on Page 75.


Johnson Co., Lloyd S., 2241 Indiana Ave., Chicago, III. See Advertisement on Page 410.

Kester Solder Co., 1212 Wrightwood Ave., Chicago 7, III. See Advertisement on Page 36.


New York Solder Co., 15 Crosby St, New York 13, N. Y. See Advertisement on Page 90.

Rubin Chemical Co., 68 McDowell St., Columbus 1, Ohio. See Advertisement on Page 176.


SOLDER — Platinum


SOLDER - Rings and Preforms

Alpha Metals, Inc., 263 Hudson Ave., Brooklyn 1, N. Y. See Advertisement on Page 163.


Dividend Lead Co., 86 W. Kinzie St., Chicago 22, Ill. See Advertisement on Page 76.


SOLDERING GUNS

See Tools, Soldering Guns

SOLDERING IRONS, ELECTRIC

See Irons, Electric Soldering

SOLENOIDS


Cannis Electric Development Co., 2200 Humboldt St., Los Angeles 31, Calif. See Advertisement on Page 76.

Clippard Instrument Lab., 1466 Chase Ave., Cincinnati 21, Ohio. See Advertisement on Page 362.


Davis & Co., Dean W., Kentland, Ind. See Advertisement on Page 161.


Electronic Transformer Co., 207 W. 25th St., St. Louis 10, Mo. See Advertisement on Page 23.


Leach Relay Co., Inc., 5915 Avalon Blvd., Los Angeles 38, Calif. See Advertisement on Page 36.


Magnetovox Co., The, Fort Wayne 4, Ind. See Advertisement on Page 76.

Magnetic Devolos Corp., 76-14 Woodside Blvd., Glendale, Calif. See Advertisement on Page 36.

Meletron Corp., 980 N. Highland Ave., Los Angeles 21, Calif. See Advertisement on Page 36.


Magnaflux Co., The, Fort Wayne 4, Ind. See Advertisement on Page 36.

SONIC PRESSURE MEASURING EQUIPMENT


SORTERS—Electronic


SOUND SYSTEMS—Complete

Alltec Lancing Corp., 1161 N. Vine St., Elmhurst, Calif. See Advertisement on Page 36.

American Radio Co., 611 E. Garfield Ave., Glendale, Calif. See Advertisement on Page 36.


Bogen Co., David, 663 Broadway, New York 12, N. Y. See Advertisement on Page 36.


Collins Audio Products Co., 126 Park St., Rochester, N. Y. See Advertisement on Page 36.

Collins Radio Co., 123 Hampshire St., Quincy, Mass. See Advertisement on Page 36.

Dilorco Corp., 2101 Bryant St., San Francisco 38, Calif. See Advertisement on Page 36.

Dilks, Inc., Norwalk, Conn. See Advertisement on Page 36.

Dayton Acme Co., 390 York St, Cincinnati 14, Ohio. See Advertisement on Page 36.


**RESISTORS**

**1947-1948 DIRECTORY of**

American Coil & Engineering Co., 1271 N. 3rd St., Chicago 13, Ill.

Audio Products Co., 2191 W. Olive Ave., Burbank, Calif.

Brown & Pope, Inc., 465 S. E. Haw-

Carter Radio Div., Precision Parts Co., 213

Chicago Institute Pl., Chicago 12, III.

Climate Engineering Co., 1446 E. 152nd St., Cleveland 16, Ohio

Continental Carbon Co., 12590 Lorain Ave., Cleveland, Ohio

David Mfg. Co., 191 Central Ave., Newark 4, N. J.

Electrical Reactance Corp., Franklinville, N. Y.

General Electric Co., Schenectady 5, N. Y.

RHEOSTATS

Hardwick, Hindle Inc., 40 Herman St., Newark 2, N. J.

See Advertisement on Page 258

Hardwick, Hindle Inc., 409 Herman St., Newark 2, N. J.

See Advertisement on Page 233


Mallory & Co., Inc., P. R., 3029 E. Wash-

RHEOSTATS - Slide Wire

Rex Rheaostat Co., 3 Foxhurst Rd., Bald-

RHEOSTATS -Slide Wire

Aerovox Corp., 740 Bellevue Ave., New

Hardwick, Hindle Inc., 409 Herman St., Newark 2, N. J.

See Advertisement on Page 233


Mallory & Co., Inc., P. R., 3029 E. Wash-

RHEOSTATS - Slide Wire

Rex Rheaostat Co., 3 Foxhurst Rd., Bald-

RHEOSTATS -Slide Wire

Aerovox Corp., 740 Bellevue Ave., New

Hardwick, Hindle Inc., 409 Herman St., Newark 2, N. J.

See Advertisement on Page 233


Mallory & Co., Inc., P. R., 3029 E. Wash-

RHEOSTATS - Slide Wire

Rex Rheaostat Co., 3 Foxhurst Rd., Bald-

**RINGS—Carbon Packing**


**RINGS—Collector**


**See Advertisement on Page 38**

**RINGS—Oil Sealing**


**See Advertisement on Page 75**

**RINGS—Making**

Barnes-Gibson-Raymond Div. of Associated

National Rivet Co., Inc., 33 Union St., Allen
town 2, Pa.

**See Advertisement on Page 250**

**SCALES—Oscilloscope**

Du Mont Labs., Inc., Allen B., 2 Main Ave., Passaic, N. J.


Republic Steel Corp., Republic Bldg., Cleve-

Ill.

Penn Fibre & Specialty Co., 3090 E. West-

Spring Corp., 6400 Miller Ave., Detroit 11, Mich.

Garrett Co., Inc., George F., 1421 Chest-

St., Philadelphia 2, Pa.

Forrest & Sons & Co., J. A., 399 Union St.,

Fisher-Pierce Co., 70 Ceylon St., Boston 8, Mass.

See Advertisement on Page 163


Radio Inventions, Inc., 155 Perry St., New York 14, N. Y.

**SCANNERS—Reflected & Transmitted Light**

Alden Products Co., 117 No. Main St., Millen, N. J.

Hollingsworth & Bros. Co., 561 Broad St., Newark 4, N. J.

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**See Advertisement on Page 39**

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**See Advertisement on Page 28**

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**See Advertisement on Page 179**

**See Advertisement on Page 229**

**See Advertisement on Page 179**

**See Advertisement on Page 222**

**See Advertisement on Page 44**
ELECTRONIC and ALLIED PRODUCTS

SCREWS

Aerolite Electronic Hardware Corp., 42 Cliff St., Jersey City, N. J.
Aircraft Screw Products Co., 47-23 35th St., Long Island City 1, N. Y.
Allmetal Screw Products Co., 80 Grand St., New York 13, N. Y.
American Screw Co., Providence, R. I.
Automatic Metal Prod. Inc., 215 Berry St., Brooklyn 1, N. Y.
Automatic Screw Co., 221 13th St., New York, N. Y.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Central Screw Co., 3511 Shields Ave., Chicago, Ill.
Chandler Products Co., 1475 Chardon Rd., Cleveland, Ohio
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Cork Electric, 2730 Southport Ave., Chicago, Ill.
Ercison Screw Machine Products Co., 25 Fabbook St., Brooklyn 1, N. Y.
Inspec Products Co., 40 Grand St., New York 13, N. Y.
Kellogg Switchboard & Supply Co., The, Cleveland, Ohio
LaMond & Sessions Co., 1971 W. 85th St., Chicago, Ill.
Lamson & Sessions Co., 1711 W. 55th St., Cleveland, Ohio
National Screw & Mfg. Co., The, Cleveland, Ohio
New England Screw Co., Keene, New Hampshire
Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.
Publicity Products Inc., 196 6th Ave., New York 14, N. Y.
Schult Co., 2906 29th Street W., Chicago 6, I11.
South Bend Tool Co., Syracuse Ave., Watertown, N. Y.
Stronghold Screw Products, 216 West Hubbard St., Chicago 10, Ill.
United Screw & Bolt Corp., 2513 W. Cutler St., Chicago, Ill.

SCREWS—Set

Allmet Screw Products Co., 80 Grand St., New York 13, N. Y.
American Screw Co., Providence, R. I.
Automatic Metal Prod. Inc., 215 Berry St., Brooklyn 1, N. Y.
Birnbach Radio Co., Inc., 145 Hudson St., New York, N. Y.
Central Screw Co., 3511 Shields Ave., Chicago, Ill.
Chandler Products Co., 1475 Chardon Rd., Cleveland, Ohio
Chase Brass & Copper Co., Inc., Waterbury, Conn.
Cork Electric, 2730 Southport Ave., Chicago, Ill.
Ercison Screw Machine Products Co., 25 Fabbook St., Brooklyn 1, N. Y.
Inspec Products Co., 40 Grand St., New York 13, N. Y.
Kellogg Switchboard & Supply Co., The, Cleveland, Ohio
LaMond & Sessions Co., 1971 W. 85th St., Chicago, Ill.
Lamson & Sessions Co., 1711 W. 55th St., Cleveland, Ohio
National Screw & Mfg. Co., The, Cleveland, Ohio
New England Screw Co., Keene, New Hampshire
Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.
Publicity Products Inc., 196 6th Ave., New York 14, N. Y.
Schult Co., 2906 29th Street W., Chicago 6, I11.
South Bend Tool Co., Syracuse Ave., Watertown, N. Y.
Stronghold Screw Products, 216 West Hubbard St., Chicago 10, Ill.
United Screw & Bolt Corp., 2513 W. Cutler St., Chicago, Ill.

SEALS — Carbon

Electro-Cite Carbon Corp., 1133 E. Columbus Avenue, Cincinnati 25, Pa.
Sealol Corp., 15 Willard Ave., Providence 5, R. I.

SEALS — Hermetic

Cincinnati Electric Products Co., Carthage at Hannaford, Cincinnati 12, Ohio
Corner Products Works, Corning, N. Y.
Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.
Inspec Products Co., 40 Grand St., New York 13, N. Y.
Lamson & Sessions Co., 1711 W. 55th St., Cleveland, Ohio
National Screw & Mfg. Co., The, Cleveland, Ohio
New England Screw Co., Keene, New Hampshire
Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.
Publicity Products Inc., 196 6th Ave., New York 14, N. Y.
Schult Co., 2906 29th Street W., Chicago 6, I11.
South Bend Tool Co., Syracuse Ave., Watertown, N. Y.
Stronghold Screw Products, 216 West Hubbard St., Chicago 10, Ill.
United Screw & Bolt Corp., 2513 W. Cutler St., Chicago, Ill.

SEALs — Metal—To—Glass

Aerolux Light Corp., 663 11th Ave., New York 19, N. Y.
Andrew Co., 363 E. 75th St., Chicago, Ill.
Carborundum Co., Reading, Pa.
Chatham Electronic Products Co., 413 Washington St., New York 13, N. Y.
Cincinnati Electric Products Co., Carthage at Hannaford, Cincinnati 12, Ohio
Corning Glass Works, Corning, N. Y.
Dorado Silver Co., 270 W. Hubbard St., Chicago, III.
Elkhart, I11.
Hermetic Seal Products Co., 414 Morris Ave., New York 13, N. Y.
Litton Engineering Labs., Redwood City, Calif.
Spleri, Inc., Northwood Station, Cincinnati 12, Ohio
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Trippelt & Barton Inc., Burbank, Calif.
Wheaton Co., T. C., Industrial Div. B, Millville, N. J.
Xerox Instrument Co., 191 Vine St., Hartford 6, Conn.

SEALS — Oil

Auburn Mfg. Co., Cumberland, Conn.
Sealol Corp., 45 Willard Ave., Providence 3, R. I.

SELECTIVE CALLING APPARATUS

Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.
Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.
See Advertisements on Pages 8A to 48D
Hermetic Seal Products Co., 414 Morris Ave., New York 13, N. Y.
Link, Fred M., 126 W. 17th St., New York, N. Y.
Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.
West Coast Electronics, Inc., 1901 S. Burlington St., Los Angeles 6, Calif.

SERVOMECHANISMS

See Controls, Servo

SCHAFTS

Aerolite Electronic Hardware Corp., 42 Cliff St., Jersey City, N. J.
Centralab Dlv., Globe Union Inc., 900 Keefe Ave., Milwaukie, Ore.
See Advertisements on Pages 8A, 25
Electronics Mechanics Inc., 10 Clifton Blvd., Clifton, N. J.
Gardiner Mfg. Co., 2711 Union St., Oakland 7, Calif.
See Advertisement on Page 90

SCHAFTS — Flexible

Birnbaum Radio Co., Inc., 145 Hudson St., New York, N. Y.
Bud Light & Radio Co., 2118 25th St., Cleve-

SCHAFTS — Flexible

Birnbaum Radio Co., Inc., 145 Hudson St., New York, N. Y.
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SCHAFTS — Flexible

Birnbaum Radio Co., Inc., 145 Hudson St., New York, N. Y.
Bud Light & Radio Co., 2118 25th St., Cleve-
June, 1947 — MID-MONTH — ELECTRONICS BUYERS’ GUIDE

RESISTORS

1947-1948 DIRECTORY of

American Coil & Engineering Co., 1271 N. Ferret Avenue, Chicago 39, Ill.
Audio Products Co., 2191 W. Olive Ave., Glendale 30, Calif.
Brown Engineering Co., 4683 S. E. Hawthorne Blvd., Portland 15, Oregon
Clark Bros., 1146 E. 152nd St., Cleveland 6, Ohio
Clarke Electric, Inc., 285-615th St., Brooklyn, N. Y.
Continental Carbon Co., 13980 Loom Ave., Cleveland, Ohio
Dahlco, 101 Central Ave., Newark 4, N. J.
Electrical Reactance Corp., Franklinville, N. Y.
Genic Electric Co., Schenectady 5, N. Y.
See Advertisement on Page 20
Hardwire, Inc., 40 Herman St., Newark, N. J.
See Advertisement on Page 222
Houlahan Co., 421 S. Th, 5214 W. Lawrence Ave., Chicago 25, Ill.
See Advertisement on Page 109
Industrial Instruments Co., 17 Pollack Ave., Jersey City 5, N. J.
Instrument Resistors Co., 1920 Commerce Ave., Union, N. J.
See Advertisement on Page 55
Lectrohm, Inc., 5125 W. 25th St., Cicero, Ill.
Legri-S Co., Inc., 846-850 Amsterdam Ave., New York 19, N. Y.
See Advertisement on Page 102
Mager Mfg. Co., 174 Main St., Madison, N. J.
Mallory & Co., F. R., 3289 E. Washington St., Indianapolis 6, Ind.
See Advertisements on Pages 257 to 290
Mallory & Co., F. R., 3289 E. Washington St., Indianapolis 6, Ind.
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See Advertisements on Pages 257 to 290
Mallory & Co., F. R., 3289 E. Washington St., Indianapolis 6, Ind.
See Advertisements on Pages 257 to 290
Mallory & Co., F. R., 3289 E. Washington St., Indianapolis 6, Ind.
See Advertisement on Page 256
Shalemo Mfg. Co., 10 Jackson Ave., Cleveland 21, Ohio
See Advertisement on Page 274
Tensor Co., 1111 E. 184th St., New York 62, N. Y.
Utah Radio Products Co., 820 Orleans St., Chicago 8, Ill.
Van Dyke Instruments, Inc., Tarrytown, Calif.
Ward Leonard Electric Co., 31 South St., Newark, N. J.
Ward Leonard Electric Co., 31 South St., Newark, N. J.
See Advertisement on Page 175
RINGS—Carbon Packing
Electro-Nite Carbon Co., 1133 E. Columbia Ave., Chicago, Ill.
RINGS—Collector
See Advertisement on Page 58
RINGS—Oil Sealing
Penn Fibre & Specialty Co., 2030 E. Westmoreland St., Philadelphia 41, Pa.
Schlitz Corp., 49 Willard St., Providence, R. I.
SCREWDRIVERS AND SMALL INSULATED TOOLS

See Tools

SCREWS

Aerolite Electronic Hardware Corp., 24 Cliff St., Jersey City, N. J.
Aircraft Screw Products Co., Inc., 47-23 W. Long Island City 1, N. Y.
Allmetal Screw Products Co., 80 Grand St., New York, N. Y.
American Screw Co., Providence, Rhode Island
Automatic Metal Products Co., 215 Berry St., Brooklyn, N. Y.
Autobolt Co., 1111 W. 15th St., New York, N. Y.
Birmingham Screw Co., Inc., 145 Hudson St., New York, N. Y.
Central Screw Co., 3511 Shields Ave., Chicago, Ill.
Chandler Products Co., 1475 Chardon Rd., Cleveland, Ohio.
Chase Brass & Copper Co., Inc., Waterbury 3, Conn.
Columbus Screw Mfg. Co., 2527 Southport St., Chicago, Ill.
Ehreth Machine Products Co., 25 West Union St., Canton, Ohio.
Harpco, H. M., The, 2620 Fletcher St., Chicago, Ill.
Hanson, Inc. John, Clay & Oakland Sts., Brooklyn, N. Y.
Hubbell Inc. Harvey, Bridgeport 3, Conn.
Insulator Products Co., Snow Ave. & Water St., Osinnin, N. Y.
International Merit Products Corp., 225 E. 39th St., New York, N. Y.
Kellogg Switchboard & Supply Co., 6650 & Cleary Ave., Chicago 33, Ill.
Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Lamson & Sessions Co., The, Cleveland, Ohio.
Park-Kalon Corp., 209 Varick St., New York, N. Y.
Publix Metal Products Inc., 100 6th Ave., New York, N. Y.
Publix Metal Screw Co., 1111 W. 34th St., Chicago, Ill.
Public Metal Screw Co., Keene, N. H.
Ridgway Electric Products Co., 1120 E. 27th St., Jersey City, N. J.

See Advertisement on Page 50

Harpco, H. M., The, 2620 Fletcher St., Chicago, Ill.
Hanson, Inc. John, Clay & Oakland Sts., Brooklyn, N. Y.
Hubbell Inc. Harvey, Bridgeport 3, Conn.
Insulator Products Co., Snow Ave. & Water St., Osinnin, N. Y.
International Merit Products Corp., 225 E. 39th St., New York, N. Y.
Kellogg Switchboard & Supply Co., 6650 & Cleary Ave., Chicago 33, Ill.
Lamson & Sessions Co., 1971 W. 85th St., Cleveland, Ohio.
Lamson & Sessions Co., The, Cleveland, Ohio.
Park-Kalon Corp., 209 Varick St., New York, N. Y.
Publix Metal Products Inc., 100 6th Ave., New York, N. Y.
Publix Metal Screw Co., 1111 W. 34th St., Chicago, Ill.
Public Metal Products Inc., 100 6th Ave., New York, N. Y.
Publix Metal Screw Co., 1111 W. 34th St., Chicago, Ill.
St. Louis & Screw & Bolt Co., 8900 Broadway, St. Louis, 15, Mo.
Shankco, Inc., Div. of Ill. Tool Wks., 221 N. Keeler Ave., Chicago 33, Ill.

See Advertisement on Page 204

Sterling Bolt Co., 209 W. Jackson Blvd., Chicago 6, Ill.
Stoughton Screw Products, 216 West Hubbard St., Chicago, Ill.
United Screw & Bolt Corp., 2533 W. Cullerton St., Chicago, Ill.

SEALs—Metal-To-Glass

Aerolite Light Corp., 652 11th Ave., New York, N. Y.
Andrew Co., 303 E. 76th St., Chicago, Ill.
Carpenter Steel Co., Reading, Pa.
Chatham Electronics, Inc., 170 Grand St., New York, N. J.

See Advertisement on Page 247

Chicago, Electric Products Co., Carterage at Hannaford, Cincinnati 12, Ohio

Electrical Industries, Inc., 42 Summer Ave., Newark, N. J.

See Advertisement on Page 236

Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.

See Advertisements on Pages 65 to 68

Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.

See Advertisements on Pages 65 to 68

General Controls Corp., 100 Kingsland Rd., Clifton, N. J.

See Advertisement on Page 12

Stewart Warner Corp., 3704 17th Ave., Chicago, Ill.

See Advertisement on Page 78

Stewart Warner Corp., 3704 17th Ave., Chicago, Ill.
SHAPERS—Television Signal

Sherron Electronics Co., 1201 Flushing Ave., New York, N. Y. See Advertisement on Page 66

SHELLING— Radio Ignition


Reynolds Metals Co., 2200 So. Third St., Louisville 1, Ky.

Shaver Industries Inc., 4721 W. Montrose Ave., Chicago, Ill.

Fishwick Radio Co., 423 Colorado Blvd., Washington, D. C. Kling Metal Spinning Co., 174 Centre St., New York 13, N. Y.

Rusell Wire & Cable Co., 4721 W. Montrose Ave., Chicago, Ill.

Searle Airo Industries, Inc., Orange, Calif.

SHEILD—Coatbridge Tube


Prec. 150 Exchange St., Malden, Mass.

Rice's Sons Inc., Bernard, 325 Fifth Avenue, New York, N. Y.

SHEILD—Cathode Ray Tube


SHEILD—Transformer


Brockway Mfg. Co., 2500 So. Third St., Louisville 1, Ky.

Shaw Mfg. Co., 445 State St., Binghamton, N. Y.

Walker-Turner Co. Inc., 1493 Belknap St., Chicago 17, Ill.


SHAPERS—Television Signal

Sherron Electronics Co., 1201 Flushing Ave., New York, N. Y. See Advertisement on Page 66

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Rice's Sons Inc., Bernard, 325 Fifth Avenue, New York, N. Y.

SHEILD—Cathode Ray Tube


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SHEILD—Transformer


Brockway Mfg. Co., 2500 So. Third St., Louisville 1, Ky.

Shaw Mfg. Co., 445 State St., Binghamton, N. Y.

Walker-Turner Co. Inc., 1493 Belknap St., Chicago 17, Ill.


SHEILD—Transformer


Brockway Mfg. Co., 2500 So. Third St., Louisville 1, Ky.

Shaw Mfg. Co., 445 State St., Binghamton, N. Y.

Walker-Turner Co. Inc., 1493 Belknap St., Chicago 17, Ill.


SHEILD— Tube

American Phenolic Corp., 1830 S. 54th Ave., Chicago 11, Ill. See Advertisement on Page 23

SHEILD—Cathode Ray Tube


Prec. 150 Exchange St., Malden, Mass.

Rice's Sons Inc., Bernard, 325 Fifth Avenue, New York, N. Y.

SHEILD—Transformer


Brockway Mfg. Co., 2500 So. Third St., Louisville 1, Ky.

Shaw Mfg. Co., 445 State St., Binghamton, N. Y.

Walker-Turner Co. Inc., 1493 Belknap St., Chicago 17, Ill.


SHEILD— Tube

American Phenolic Corp., 1830 S. 54th Ave., Chicago 11, Ill. See Advertisement on Page 23

SHEILD—Cathode Ray Tube


Prec. 150 Exchange St., Malden, Mass.

Rice's Sons Inc., Bernard, 325 Fifth Avenue, New York, N. Y.

SHELTERS—Signal

Communication Measurements Lab. Inc., 156 Greenwich St., New York, N. Y.

Hallericorers Co., 4401 W. Fifth Ave., Cincinnati 6, Ohio

Harvey Radio Labs., Inc. 447 Concord Ave., Cambridge, Mass.

Measurement Engineering Ltd., 61 Duke St., Toronto, Can.


Prec. 150 Exchange St., Malden, Mass.

Rice's Sons Inc., Bernard, 325 Fifth Avenue, New York, N. Y.

SHIELD—Transformer


Brockway Mfg. Co., 2500 So. Third St., Louisville 1, Ky.

Shaw Mfg. Co., 445 State St., Binghamton, N. Y.

Walker-Turner Co. Inc., 1493 Belknap St., Chicago 17, Ill.


SHEILD— Tube

American Phenolic Corp., 1830 S. 54th Ave., Chicago 11, Ill. See Advertisement on Page 23

SHEILD—Cathode Ray Tube


Prec. 150 Exchange St., Malden, Mass.

Rice's Sons Inc., Bernard, 325 Fifth Avenue, New York, N. Y.
ELECTRONIC and ALLIED PRODUCTS

SUPPRESSORS

Auto Radio Ignition
Consolidated Wire & Associated Companies, 1525 S. Clinton St., Chicago 16, Ill.
Continental Carbon, Inc., 13900 Lorain Ave., Cleveland 11, Ohio
Erie Resistor Corp., 644 W. 12th St., Erie, Pa.
See Advertisement on Page 47

Fluorescent Light
Atlas Condenser Products Co., 3120 Third Ave., New York, N. Y.
Centralab Div., Globe Union Inc., 900 Keele Ave., Milwaukee 1, Wis.
See Advertisements on Pages 44, 45

Ionostron Static Eliminator
U. S. Radius Corp., 535 Pearl St., New York 7, N. Y.

Noise
Amplifier Corp. of America, 336 Broadway, New York 7, N. Y.
Atlas Condenser Products Co., 3120 Third Ave., New York, N. Y.
Consolidated Wire & Associated Companies, 1525 S. Clinton St., Chicago 16, Ill.
Continental Carbon, Inc., 13900 Lorain Ave., Cleveland 11, Ohio
Erie Resistor Corp., 644 W. 12th St., Erie, Pa.
See Advertisement on Page 47

Parasitic
Pyramid Electric Co., 158-73 22nd St., Long Island City, N. Y.
Pyramid Electric Co., 158 Oxford St., South Bend, Ind.
Searle Aero Industries, Inc., Orange, Calif.
Texas Instruments Corp., 1565 Main St., Waitham, Mass.

Parasitic
Clarostat Mfg. Co., Inc., 285-7 6th St., Brooklyn, N. Y.
Erie Resistor Corp., 644 W. 12th St., Erie, Pa.
See Advertisement on Page 47

Stroboscopes
University Loudspeakers Inc., 225 Varick St., New York 7, N. Y.
Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.
See Advertisements on Pages 88, 89

STANDARDS-Inductance
Industrial Transformer Corp., 2540 Belmont Ave., New York 38, N. Y.
W-W Inductor Co., 1956 N. Wood St., Chicago, Ill.
United Transformer Corp., 195 Varick St., New York 13, N. Y.
See Advertisement on Inside Front Cover

STANDARDS-Laboratory Time
Gibbs Dial Div., W. O. Borg Corp., Delavan, Wis.
Hathaway Instrument Co., 1515 S. Clarkson St., Denver 10, Colo.
Norman Labs, Ernst, Williams Bay, Wis.

STANDARDS-Microphone
American Microphone Co., 1550 W. Verdugo Ave., Burbank, Calif.
Nielsen Electrical Lab., Inc., 115 Lafayette St., New York 13, N. Y.

STANDS-Microphone
Amperite Co., 561 Broadway, New York, N. Y.
See Advertisement on Page 282
Art Specialty Co., 3435 Lake St., Chicago, Ill.
Astoria Corp., Connect, Ohio
Atlas Sound Corp., 1443 39th St., Brooklyn 18, N. Y.
See Advertisement on Page 68D
Burlington Div., 2115 E. 55th St., Cleveland 5, Ohio
Elecotope Voice Corp., 1239 South Bend Ave, South Bend 24, Ind.
Elecotope Voice Corp., 52 E. 14th St., New York 3, N. Y.
See Advertisement on Page 93
Molenorton Corp., 1058 N. Highland Ave., Los Angeles 58, Calif.
Radio Research Labs., 52 East 19th St., New York 3, N. Y.
See Advertisement on Page 513
Radio Corp. of America, RCA Victor Div., Camden, N. J.
See Advertisements on Inside Back Cover & Back Cover, 251
Shure Brothers, 235 N. Huron St., Chicago, Ill.
See Advertisement on Page 157
Turner Co., Cedar Rapids, Iowa
University Microphone Co., Ingegwood, Iowa
See Advertisement on Page 84

STANDARD—Gamma Ray
Vickerman Instrument Co., 5806 Hough Ave., Cleveland 3, Ohio

STANDARDS—Gamma Ray
Vickerman Instrument Co., 5806 Hough Ave., Cleveland 3, Ohio

STEADITE
See Insulation Materials

STENCKLS-Metal Marking
Acromark Co., 5-13 Morrell St., Elizabeth, N. J.
Austin Co., 338 Throop Ave., Brooklyn 1, N. Y.
Luna Electric Equipment Co., P. O. Box 202, Jersey City, N. J.
Numberfalt Stamp & Tool Co., Huguenot Park, Staten Island 12, N. Y.

STETHOGRAphS AND STETHOPHONES
Shure Brothers, 225 W. Huron St., Chicago, Ill.
See Advertisement on Page 157

STETHOSCOPl-—Amplifying
Audio Development Co., 2833 13th Ave., S., Seattle 2, Wash.
Malco Corp., 25 N. 3rd St., Minneapolis, Minn.
Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.
See Advertisements on Pages 88, 89

STRAIN RELIEFS
American Phenolic Corp., 1889 S. 54th Ave., Chicago 31, Ill.
See Advertisement on Page 23
Campbell-Reeder, 1027 W. Kinzie Street, Milwaukee, Wis.
Heyman Mfg. Co., Kensington, N. J.
Walker Co., George, 118 Amsterdam Ave., Passaic, N. J.
See Advertisement on Page 246

STRAPS—Leather

STROBOSCOPES
Communication Measurements Lab., 120 Greenwich St., New York, N. Y.
**SURFACE ANALYSERS AND COMPARATORS**

See Analysts

**SUPPRESSIONS—Speaker**

Hawley Products Co., St. Charles, Ill.

**SUPPRESSIONS—Switch**


**SUPPRESSIONS—Wiring**

Kay Electric Co., 34 Marshall St., Newark, N. J.

See Advertisement on Page 184

Searl Aero Industries, Inc., Orange, Calif.

**SWITCH PARTS**

*Call Letter Tabs*

Bostonian Process Co., 40 W. 12th St., New York 11, N. Y.

Cardy & Landmark Corp., 1801 W. Byron St., Chicago 13, Ill.

Ever Ready Label Corp., 141-25 E. 55th St., New York 10, N. Y.


See Advertisement on Page 90

Insignia Corp. of America, 36-02 35th Ave., Long Island City, N. Y.

See Advertisement on Page 59

Parisian Novelty Co., 3160 South Western Ave., Chicago 8, Ill.

Plastic Accessories, Inc., 460 Broomo St., New York 14, N. Y.

Plastic Fabricators Inc., 440 Sason St., San Francisco 11, Calif.


Printers Supply Co., 95 Mercer St., New York 11, N. Y.

See Advertisement on Page 198

*Contacts*

Fansteel Metallurgical Corp., 2200 Sheridan Rd., No. Chicago, III.

Gamm & Sons Inc., E. P., 330 Union Ave., Paterson, N. J.

Leach Relay Co. Inc., 5915 Avalon Blvd., Los Angeles 33, Calif.

Superior Carbon Products Inc., 9112 George Ave., Cleveland, Ohio

Switchgear, Inc., 7 West Diversey Parkway, Chicago 14, Ill.

*Telegraph Tape*

Poote Pierson & Co., Inc., 75 Hudson St., Newark 4, N. J.

**SWITCHBOARDS—Radio**

American Communications Corp., 306 Broadway, New York 7, N. Y.

Federal Telephone and Radio Corp., 50 Park St., Newark, N. J.

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 98B, 96C

**SWITCHBOARDS—Switch**

American Communications Corp., 136-56 38th Ave., Woodside, N. Y.

Federal Telephone and Radio Corp., 136-56 38th Ave., Woodside, N. Y.

Hart Mfg. Co., 340 Barbihomew Ave., Hartford 1, Conn.

Oscram Corp., Auburn Rd., Seneca Falls, N. Y.

Signal Engineering & Mfg. Co., 154 W. 14th St., New York, N. Y.

See Advertisement on Page 254

**SWITCHES—Coaxial Cable**

Bird Electronic Corp., 1800 E. 38th St., Cleveland 14, Ohio.


Kings Electronics Co., 372 Classtown, Brooklyn 5, N. Y.

**SWITCHES—Control**

Adams & Westlake Co., Michigan St., Dillhart, Ind.

Avometer Corp., 670 W. 55th St., New York 1, N. Y.

Barber Colman Co., River & Loonion Sts., Rockford, Ill.

Cook Electric Co., 2700 Southport Ave., Chicago, Ill.

Cutler-Hammer, Inc., 315 No. 12th St., Milwaukee 1, Wis.

Electronic Controls, Inc., 44 Summer Ave., Newark, N. J.


See Advertisement on Page 90

General Electric Co., Schenectady 5, N. Y.

General Electric Co., Bridgeport 2, Conn.

General Electric Co., 4835 W. Flournoy St., Chicago 25, Ill.

Insulation Corp. of America, 36-02 35th Ave., Long Island City, N. Y.

See Advertisement on Page 166

Swatchift, Inc. 1736 West Diversey Parkway, Chicago 14, Ill.

Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

See Advertisements on Pages 88, 89

**SWITCHES—Knife**

Arrow-Hart & Hegeman Electric Co., 103 Hawthorn St., Hartford 6, Conn.

Bihrlich Radio Co. Inc., 145 Hudson St., New York, N. Y.

General Electric Co., Bridgeport 2, Conn.

Insulation Corp. of America, 36-02 35th Ave., Long Island City, N. Y.

See Advertisement on Page 166


See Advertisement on Page 199


See Advertisement on Page 43

Westinghouse Electric Corp., 3533 South L. N. J. Railroad Ave., Newark 6, N. J.

Trumpell Electric Co., 88 Adams Ave., Plainville, Conn.

Westinghouse Electric Corp., 3533 South L. N. J. Railroad Ave., Newark 6, N. J.

**SWITCHES—Leever**

Automatic Electric Co., 1023 W. Van Buren St., Chicago 12, Ill.

Centralab, Div. of Globe Union Inc., 900 Centralab Ave., Milwaukee 1, Wis.

See Advertisement on Pages 21, 22

Clare & Co., C. F., 4719 Sunnyside Ave., Chicago 36, Ill.

General Electric Co., Bridgeport 2, Conn.

General Electric Co., 4835 W. Flournoy St., Chicago 25, Ill.

Insulation Corp. of America, 36-02 35th Ave., Long Island City, N. Y.

See Advertisement on Page 166

Long Island Electric Co., 300 Broadway, New York 11, N. J.

See Advertisement on Page 166

Long Island Electric Co., 300 Broadway, New York 11, N. J.

**SWITCHES—Limit**

Aero Electric Co., 1315 Superior Ave., Cleveland, Ohio

Arklow Engineering Co., 1717 51 Water St., Water- town, Mass.

Baldwin, Co., 134 W. Greenfield Ave., Milwaukee 3, Wis.

Cook Electric Co., 2700 Southport Ave., Chicago, Ill.

Cuthbert-Hammer, Inc., 315 North 12th St., Milwaukee 1, Wis.

Fries Instrument Div., Bendix Aviation Corp., 1722-24 E. 58th St., Chicago 17, Ill.

General Electric Co., Schenectady 5, N. Y.

General Electric Co., Bridgeport 2, Conn.

General Electric Co., 4835 W. Flournoy St., Chicago 25, Ill.

Hetherington & Son, Inc., Ripley Ave., St. Louis, Mo.

Mercoid Corp., 1291 Belmont Ave., Brooklyn 12, N. Y.

**SWITCHES—Suppression**


Cutler-Hammer, Inc., 515 No. 12th St., Milwau- kee 7, Wis.

General Electric Co., Schenectady 5, N. Y.

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**SWITCHES—Switchboard**

Federal Telephone and Radio Corp., 1033 W. Van Buren St., Chicago 12, Ill.


General Electric Co., Bridgeport 2, Conn.

Mercoid Corp., 1291 Belmont Ave., Brooklyn 12, N. Y.

Potter Instrument Co., 1316-56 38th Ave., Woodside, N. Y.

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**SWITCHES—Wiring**

American Communications Corp., 306 Broadway, New York 7, N. Y.

Federal Telephone and Radio Corp., 50 Park St., Newark, N. J.

General Electric Co., Schenectady 5, N. Y.

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**BUYERS’ GUIDE**

D-100

1947-1948 DIRECTORY of
SWITCHES—Time

Adams & Westlake Co., Michigan St., Elyria, Ohio
Autocontrol Co., The, Shelby, Ohio

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General Electric Co., Schenectady 5, N. Y.

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Hart Mfg. Co., 110 Bartholomew St., Indianapolis 6, Ind.

Wood Electric Co., 31 South St., Mt. Vernon, N. Y.

Ward Ross Electric Co., 31 South St., Mt. Vernon, N. Y.


SWITCHES—TR


Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

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Motel Corp., 98 N. Highland Ave., Los Angeles 36, Calif.

Western Electric Co., Inc., 195 Broadway, New York 6, N. Y.

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SYNCHRONIZERS—Electronic


Burlington Instrument Co., 214 N. 4th St., Burlington, Iowa

Control Corp., 718 Central Ave., Minneapolis 14, Minn.

DeMorgan-Burn Inc., 475 Grand Concourse, New York 3, N. Y.

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Sherwood Electronics, 1301 Flushing Ave., Brooklyn 6, N. Y.

SYNCHRONIZERS—Electronic Aircraft Magneto

Electric Heat Control Co., The, 9123 Inman Ave., Cleveland 5, Ohio


Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

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SYNCRONSCOPES

American Radio Co., 611 E. Garfield Ave., Chicago, Ill.

Glendale, Calif.


General Electric Co., Schenectady 5, N. Y.

Hazelton Electronics Corp., 1776 Broadway, New York 19, N. Y.


Polaroid Electronics Co., 44 Liberty St., New York 5, N. Y.

Radar Engineers, 4004 Arcade Bldg., Seattle 1, Wash.

Miller Control Co., 51 S. Gay St., Baltimore 2, Md.


Mossman, Donald, 612 N. Michigan Ave., Chicago, Ill.

Muter Co., 1356 S. Michigan Ave., Chicago, Ill.

PASS & Seymour, Inc., Bolivar Station, Syrac.


Switchcraft, Inc., 1735 West Diversey Parkway, Chicago 13, Ill.

Trumbull Electric Co., Co., Plainville, Conn.


Utah Radio Products Co., 820 Orleans St., Salt Lake City, Utah

Ward Ross Electric Co., 31 South St., Mt. Vernon, N. Y.


TELEMETERING SYSTEMS—Electronic


Bally Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio


Electro Heat Control Co., 9123 Inman Ave., Cleveland 5, Ohio


Electronic Development Co., 4420 N. 23rd St., Omaha 11, Nebraska

Foxboro Co., Foxboro, Mass.

General Electric Co., Schenectady 5, N. Y.

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Leupold & Stevens Instruments, 4445 S. Greenwood Ave., Portland 13, Ore.

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Ripleys Co., 812 Broadway, New York 3, N. Y.

Sticht Co., Inc., Herman H., 27 Park Pl., New York 7, N. Y.


Zernickow Co., O. 15 Park Row, New York 7, N. Y.

TAPE—Magnetic Recorder

Brush Development Co., The, 9405 Perkins Ave., Cleveland 17, Ohio

Controls Labs., Inc., 93 Union St., Worceston Ave., Indianapolis 6, Ind.

Indiana Steel Products Co., The, 9123 Inman Ave., Cleveland 5, Ohio

See Advertisement on Page 54

Miller Bros. Controls Co., Inc., 812 Broadway, New York 3, N. Y.

See Advertisement on Page 255


TAPE—Insulation Parts

Telemetering Systems—Electronic


Bally Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio


Control Corp., 718 Central Ave., Minneapolis 14, Minn.

Esterline-Angus Co., Inc., 5 P. O. Box 596, Indianapolis, Ind.


General Electric Co., Syracuse, N. Y.

See Advertisements on Pages 96A, 96B

Glidden & Co., Inc., G. M. Autolight In-

See Advertisement on Page 80


Bally Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio


Control Corp., 718 Central Ave., Minneapolis 14, Minn.

Esterline-Angus Co., Inc., P. O. Box 596, Indianapolis, Ind.


General Electric Co., Syracuse, N. Y.

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Glidden & Co., Inc., G. M. Autolight In-
<table>
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<tr>
<th>Company Name</th>
<th>Address</th>
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<tr>
<td>MacLeod &amp; Hanopol, 303 W. 42nd</td>
<td>Cincinnati, Ohio</td>
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<td>Ecco High Frequency Corp.</td>
<td>Norwalk, Conn.</td>
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<td>Dilks, Inc.</td>
<td>Cleveland, Ohio</td>
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<td>Stupakoff Ceramic &amp; Mfg.</td>
<td>St. Louis, Mo.</td>
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<td>Hermaseal Co.</td>
<td>Dayton, Ohio</td>
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<td>Doolittle Radio, Inc.</td>
<td>North Bergen, N. J.</td>
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<td>Corning Glass Works, Inc.</td>
<td>Long Island City, N. Y.</td>
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<td>THERMALS -Hermetically Sealed</td>
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<td>Cincinnati Electric Products Co.</td>
<td>Cincinnati, Ohio</td>
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<td>Gordon-Appleton Co.</td>
<td>Chagrin Falls, Ohio</td>
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<td>National Co., inc.</td>
<td>New York 13, N. Y.</td>
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<td>TESTERS—Battery</td>
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<td>Assembly Products, Inc.</td>
<td>Chagrin Falls, Ohio</td>
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<td>Chaslyn Co.</td>
<td>New York 13, N. Y.</td>
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<td>Daven Co., 151 Central Ave.</td>
<td>New York 13, N. Y.</td>
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<td>Electronic Engineering Co., 4420 N. 23rd St.,</td>
<td>Nebraska, Omaha</td>
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<td>Electric Measuring Instruments Co., 812</td>
<td>Kansas, Mo.</td>
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<td>MB Instruments Co., 1009 State St.</td>
<td>New York, N. Y.</td>
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<td>Metrologic Electric &amp; Instrument Co., 8</td>
<td>New York, N. Y.</td>
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<td>Precision Apparatus Co., 102-27</td>
<td>New York, N. Y.</td>
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<td>Sterling Mfg., Inc.</td>
<td>Ohio, N. Y.</td>
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<td>Sun Mfg., 6323 Avondale Ave.</td>
<td>Ohio, N. Y.</td>
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<td>Supreme Instruments Corp.</td>
<td>Ohio, N. Y.</td>
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<td>TESTERS—Capacitor</td>
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<td>Electric Heat Control Co., 9212 Innam Ave.</td>
<td>New York, N. Y.</td>
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<td>Hazeline Engineering Corp., 1757 Broadway</td>
<td>New York, N. Y.</td>
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<td>Industrial Instruments Co. 17 Pollack Ave,</td>
<td>New York, N. Y.</td>
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<td>Jersey City, N. Y.</td>
<td>New York, N. Y.</td>
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<td>Jackson Electrical Instrument Co., 16 P.</td>
<td>New York, N. Y.</td>
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<td>MacLeod &amp; Hanopol, 303 W. 42nd</td>
<td>New York, N. Y.</td>
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<td>Measurement Engineering Ltd., 61 Duke St.,</td>
<td>New York, N. Y.</td>
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<td>Toronto, Can.</td>
<td>New York, N. Y.</td>
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<td>TESTERS—Continuity</td>
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<td>Assembly Products, Inc.</td>
<td>Chagrin Falls, Ohio</td>
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<td>Dayton Ave, Co., 930 York St.,</td>
<td>Cincinnati, Ohio</td>
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<td>Electronic Development Co., 4420 N. 23rd St.,</td>
<td>Nebraska, Omaha</td>
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<td>Electric Instrument Co., 925 Madison Ave.,</td>
<td>New York, N. Y.</td>
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<td>MacLeod &amp; Hanopol, 24 E. 32nd St.</td>
<td>New York, N. Y.</td>
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<td>General Electric Co., Syracuse, N. Y.</td>
<td>New York, N. Y.</td>
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<td>Hidok Electric Instrument Co.</td>
<td>New York, N. Y.</td>
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<td>Intex Co., 930 W. 24th St.,</td>
<td>New York, N. Y.</td>
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<td>Jackson Electrical Instrument Co.</td>
<td>New York, N. Y.</td>
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<td>MacLeod &amp; Hanopol, 24 E. 32nd St.</td>
<td>New York, N. Y.</td>
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<td>TESTERS—Coating Thickness</td>
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<td>American Instrument Co., 8300 Georgia Ave.,</td>
<td>New York, N. Y.</td>
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<td>Universal Electric Corp., 618 Freehlinghuyzen Ave.</td>
<td>New York, N. Y.</td>
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<td>Supreme Instruments Corp., Greenwood, Miss.</td>
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<td>TESTERS—Circuit</td>
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<td>Assembly Products, Inc.</td>
<td>Chagrin Falls, Ohio</td>
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<td>Dayton Ave, Co., 930 York St.,</td>
<td>Cincinnati, Ohio</td>
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<td>Electronic Development Co., 4420 N. 23rd St.,</td>
<td>Nebraska, Omaha</td>
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<td>General Electric Co., Syracuse, N. Y.</td>
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<td>New York, N. Y.</td>
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<td>Intex Co., 930 W. 24th St.,</td>
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<td>Jackson Electrical Instrument Co.</td>
<td>New York, N. Y.</td>
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<td>MacLeod &amp; Hanopol, 24 E. 32nd St.</td>
<td>New York, N. Y.</td>
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June, 1947 — MID-MONTH — ELECTRONICS BUYERS’ GUIDE
TIMERS—Motor Operated
Ansonia Clock C, 103 Lafayette St.,
New York 0, N. Y.
Barber & Weeks Co., 53 River & Loomis Sts.,
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Clarion, Inc., 285-7 6th St.,
Brooklyn, N. Y.
Cramer C, R. W., Centerior, Conn.
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Electronic Controls, Inc., 388 Boylston St.,
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General Electric Co., Schenectady 5, N. Y.
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Haydon C, A. W., The, Waterbury 32,
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Paragon Electric Corp., 77 Van Buren St.,
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Potter & Bramfield Mfg. Co., 617 N. Gibson
St., Princeton, Ind.
Raytheon Electric Corp., 2560 W. Congress St.,
Chicago 12, Ill.
Self-Winding Clock Co., 205 Willoughby Ave.,
Brooklyn 5, N. Y.
Telemor Corp., Homer Ave., Ashland, Mass.
Tork Clock Co., 1 Grove St., M. T., Vernon, N. Y.
Ward Leonard Electric Co., 31 South St.,
Mt. Vernon, N. Y.
TIMERS—Photoelectric
Electrity Equipment Co., 18 W. Fairchild
St., Danville, Ill.
Electronic Instrument Co., Inc., 229 Clark
Ave., Brooklyn 2, N. Y.
Electronic Mechanical Products Co., 13-17
17 N. Virginia Ave., Atlantic City, N. J.
Fisher-Pierce Co., 70 Ceylon Ave., New York 21, N. Y.
Insrline Corp. of America, 36-02 85th
Park, N. Y.
Luma Electric Equipment Co., P. O. Box 718,
New York 25, N. Y.
Precision Scientific Co., 1750 N. Springfield Ave.,
Chicago 47, Ill.
TIMERS—Sequence
Adams & Westlake Co., Michigan St., Elk-
hart, Ind.
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Luma Electric Equipment Co., P. O. Box 132,
Toledo 1, Ohio
Aerolic Electronic Hardware Corp., 24 Cliff
St., Jersey City, N. J.
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American Phenolic Corp., 1830 S. 34th Ave.,
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Bridgestone Hardware Mfg. Co., Iranistan Ave., Bridgeport, Conn.
General Electric Co., Schenectady 5, N. Y.
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Greenlee Tool Co., 2136 12th St., Rockford,
Ill.
Inoue Mfg. Co., Ltd., 6-32 35th Ave.,
Long Island City, N. Y.
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Metzger & Son, E. F., 2606 N. 6th St., Phila-
delphia 35, Pa.
O'Neil-Irwin Mfg. Co., 316 Eighth Ave.,
Minneapolis 19, Minn.
Park Metalware Co., 25 Bank St., Orchard
Park, N. Y.
Schneekirk Co., Inc., George D., 229 Lafayette
St., New York 12, N. Y.
Speedweld Mfg. Co., 1544 South 52nd Ave.,
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Stanley Works, The, New Britain, Conn.
Stevenson-Walden, Inc., 460 Shrewsbury
Vaco Products Co., 317 E. Ontario St., Chi-
icago 12, Ill.
Waterbury Companies, Inc., Waterbury 66,
Wisconsin 1, S. Ludlow St., Dayton 2, Ohio
TOOLS—Soldering Guns
Barker-Phillips Co., 3957 Lyndale Ave. S.,
Minneapolis 8, Minn.
Wye Labs., 211 S. Ludlow St., Dayton 2, Ohio
TRACERS, RADIOACTIVE
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TRACERS—Signal
Aerometric Equipment Corp., 1532-8 Central
Street Boulder City, Nev.
Dayton Mfg. Co., 120 York St., Cincinnati
14, Ohio
Electro-Development Co., 4420 N. 23rd St.,
Omaha 11, Nebraska
Electronic Instrument Co., 926 Clarkson
Ave., Brooklyn 3, N. Y.
Feller Engineering Co., 593 Milwaukee Ave.,
Chicago 22, Illinois
Htokok Electrical Instrument Co., 10514
Dupont Ave., Cleveland, Ohio
Millburn Electronic Products Co., 1 Worth
St., New York 15, N. Y.
H-W Mfg. Co., P. O. Box 1781, Los An-
exes 25, Calif.
Jacobsburg Electrical Instrument Co., 16 S.
Patterson Blvd., Dayton 1, Ohio
McMurdo Silver Co., 1249 Main St., Har-
ford 2, Conn.
Meissner Mfg. Div., The, Maguire Industries,
Inc., Mt. Carmel, Ill.
Metropolitan Electronic & Instrument Co.,
450 Murray Ave., New York 7, N. Y.
Omec On Electric Co., 718 Columbus Ave.,
Chicago 50, N. Y.
Radio City Products Co., 127 W. 26th St.,
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Radio Corp. of America, RCA Victor Div.,
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Reiner Electrical Co., 155 W. 26th St.,
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Superior Instruments Co., 227 Fulton St.,
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Supreme Instruments Corp., Greenwood,
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Waterman Products Co., Inc., 2445-63 Emerald
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ELECTRONIC and ALLIED PRODUCTS
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TRANSCEIVERS—Audio

Acoma Electric Corp., Cuba, N. Y.
American Electric Corp., 3878 E. Fifth Ave., Cleveland 10, Ohio
American Transformer Co., 225 Varick St., New York 13, N. Y.
American Transformer Co., 62 William St., New York, N. Y.
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American Transformer Co., 1500 Pennsylvania Ave., Washington, D.C.
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American Transformer Co., 3878 E. Fifth Ave., Cleveland 10, Ohio
American Transformer Co., 62 William St., New York, N. Y.
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American Transformer Co., 3878 E. Fifth Ave., Cleveland 10, Ohio
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American Transformer Co., 1500 Pennsylvania Ave., Washington, D.C.
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American Transformer Co., 3878 E. Fifth Ave., Cleveland 10, Ohio
American Transformer Co., 62 William St., New York, N. Y.
American Transformer Co., 1500 Pennsylvania Ave., Washington, D.C.
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American Transformer Co., 3878 E. Fifth Ave., Cleveland 10, Ohio
American Transformer Co., 62 William St., New York, N. Y.
ELECTRONIC and ALLIED PRODUCTS

TRANSFORMERS—Current

American Coil & Engineering Co., 1271 N. Hermitage Ave., Chicago 22, Ill.
Annis Co., R. B., 1191 N. Delaware St., Indianapolis, Ind.
Assembly Div., Inc., Chagrin Falls, Ohio
Burlington Instrument Corp., 214 North 4th St., Burlington, Iowa
Davis & Co., Dean W., Kentland, Ind.
Sorensen & Co., 375 Fairfield Ave., Stamford, Conn.
Lenkurt Electric Co., Inc., P. O. Box 596, La Grange, Ill.
Federal Telephone and Radio Co., 100 Kingsland Ave., Hifton, N. J.
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Freed Transformer Co., 73 Spayg St., New York 12, N. Y.
New York Transformer Co., Inc., 82 William St., New York 12, N. Y.
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Sorensen & Co., 375 Fairfield Ave., Stamford, Conn.
.destination. See Advertisement on Page 154
Sorensen & Co., 375 Fairfield Ave., Stamford, Conn.
destination. See Advertisement on Page 154
Sorensen & Co., 375 Fairfield Ave., Stamford, Conn.
destination. See Advertisement on Page 154
TRANSMITTERS — Facsimile
Iden Products Co., 117 No. Main St.,
Brockton, Mass.

Union Line Co., 1033 W. Van Buren
St., Chicago, Ill.

adaterial Telephone and Radio Corp.,
100 East 42nd St., New York 17, N. Y.

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SMITH-GRAHAM & CO., 9th & Kearney Sts.,
Chicago 7, Ill.

Sunbeam Products, Inc., 2440 W. 47th St.,
Chicago, Ill.

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Western Union Telegraph Co., 60 Hudson
St., New York 13, N. Y.

Hastingshouse Electric Corp., Industrial
Electronic Div., Baltimore, Md.

American Radio Co., 611 E. Garfield Ave.,
Glendale, Calif.

Barker & Williamson, 235 Fairfield Ave.,
Camden, N. J.

Bendix Radar, 142 Avenue A, Chicago 54, Ill.

Collins Radio Co., Cedar Rapids, Iowa

Federal Telephone and Radio Corp., 100 to 33
Communications Co., Inc., 300 Greco Ave.,
Santa Monica, Calif.

Dine and Co., Inc., 2221 Warwick
Ave., Santa Monica, Calif.

Electric City Beach Co., 616 G St., San
Diego, Calif.

Eero Radio Labs., Inc., Fenimore Ave.,
Glendale, Calif.

Farnsworth Television & Radio Corp., 251
W. 19th St., New York, N. Y.

Finn Mfg. Co., 160 State St., New York 7, N. Y.

Gates Radio Co., Cedar Rapids, Iowa

General Electric Co., Syracuse, N. Y.

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Hammarlund Mfg. Co., Inc., 346 Kingsland Rd.,
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Kaar Engineering Co., 619 Emerson St.,
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Radio Receptor Co., 251 W. 19th St., New
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Radio Specialty Mfg. Co., 2023 S. E. Sixth
Ave., Portland 14, Ore.

Rheem Mfg. Co., 1201 E. 3rd Ave.,
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Sherron Electronics Co., 619 Emerson St.,
Camden, N. J.

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Television Products Inc., 7466 West Irving
Park Rd., Chicago 24, Ill.

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Whitinghouse Electric Corp., Industrial
Electronic Div., Baltimore, Md.

Wilkos Electric Co., 1400 Chestnut St.,
Kansas City, Mo.

TRANSMITTERS — Portable and Mobile
Radio Telephone

Aero Communications, Inc., 231 Main St.,
Fremont, N. Y.

American Radio Co., 611 E. Garfield Ave.,
Glendale, Calif.

Barker & Williamson, 235 Fairfield Ave.,
Camden, N. J.

See Advertisements on Inside Back Cover.
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Television Products Inc., 7466 West Irving
Park Rd., Chicago 24, Ill.

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Whitinghouse Electric Corp., Industrial
Electronic Div., Baltimore, Md.

Eero Radio Labs., Inc., Fenimore St., Hemp-
stead, N. Y.

Federal Telephone and Radio Corp., 100
Kingston Rd., Clifton, N. J.

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Fisher Research Lab., 1961 University Ave.,
Palo Alto, Calif.

Gates Radio Co., 123 Hampton Rd., Hamp-
shire, Ill.

General Communication Co., 230 Com-
monwealth Ave., Boston 10, Mass.

General Electric Co., Syracuse, N. Y.

See Advertisements on Pages 96, 96A

Hammarlund Mfg. Co., Inc., 346 Kingsland Rd.,
Clifton, N. J.

Kaar Engineering Co., 619 Emerson St.,
Camden, N. J.

See Advertisements on Inside Back Cover,
Back Cover & 231

Radio Receptor Co., 251 W. 19th St., New
York, N. Y.

See Advertisement on Page 40

Radio Specialty Mfg. Co., 2023 S. E. Sixth
Ave., Portland 14, Ore.

Rheem Mfg. Co., 1201 E. 3rd Ave.,
Los Angeles 14, Calif.

Sherron Electronics Co., 619 Emerson St.,
Camden, N. J.

See Advertisement on Inside Back Cover.
Back Cover & 231

Television Products Inc., 7466 West Irving
Park Rd., Chicago 24, Ill.

See Advertisements on Pages 88, 89
Whitinghouse Electric Corp., Industrial
Electronic Div., Baltimore, Md.

Wilkos Electric Co., 1400 Chestnut St.,
Kansas City, Mo.

Eero Radio Labs., Inc., Fenimore St., Hemp-
stead, N. Y.
TRANSMITTERS


General Electric Co., Syracuse, N. Y.

Gray Radio Co., 730 Okeeshobee Rd., W. Palm Beach, Fla.

Hallcrafters Co., 4401 W. Fifth Ave., Cincinnati 2, Ohio


Hose-McCann Telephone Co., 177 Pacific St., Brooklyn 1, N. Y.

Hudson American Corp., 35 W. 42nd St., New York, N. Y.

Jefferson, R. E., 40 E. Merrick Rd., Freeport, N. Y.

Kaar Engineering Co., 619 Emerson St. Hempstead, N. Y.

Kalbfeld. 4717 Morena Blvd., San Diego 10, Calif.

Link, Fred M., 215 W. 17th St., New York, N. Y.

Mecan Industries, John, Liberty at Paine, Ind., Plymouth, Ind.

Mobile Communications Co., 205 East Fourth St., Long Beach 2, Calif.


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Northern Radio Co., 2208 4th Ave., Seattle 1, Wash.

Pan American Electric Co., Inc., 2921 Atwater Ave., Brooklyn 6, N. Y.


Radio Corp. of America, RCA Victor Div., Camden, N. J.

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Radio Development and Research Co., 1249 Main St., Great Neck, Long Is., N. Y.

Radioex Co., Inc., 1201 Flushing Ave., Brooklyn 6, N. Y.

Radioindustries, John, Liberty at Paine, Ind., Plymouth, Ind.


Radionarine Corp. of America, 75 Varick St., New York 13, N. Y.

Raytheon Mfg. Co., 1249 Main St., Groton, Conn.


Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.

West Coast Electronics Co., 1501 S. Burling- 

ton St., Los Angeles 6, Calif.

Westwood Electric Co., Inc., 195 Broadway, New York 7, N. Y.

TRANSMITTERS — Radar

DeMornay-Budd Inc., 475 Grand Concourse, New York 51, N. Y.

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General Electric Co., Syracuse, N. Y.

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Radio Corp. of America, RCA Victor Div., Camden, N. J.

See Advertisements on Inside Back Cover.

Radiomarine Corp. of America, 75 Varick St., New York 13, N. Y.

Rees-Hoffman Corp., 215 E. 91st St., New York 28, N. Y.

See Advertisement on Page 189

Rees-Instrument Corp., 215 E. 91st St., New York 28, N. Y.

Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.

See Advertisements on Pages 80A, 80B


Transmitter Equipment Mfg. Co., Inc., 345 Hudson St., New York 14, N. Y.

TRANSMITTERS — Radio Range

Aero Communications, Inc., 231 Main St., Reading, Pa.


Aero Communications, Inc., 6278 S. Western Ave., Chicago 32, Ill.

Thermonic Engineering Corp., Pulport, Conn.

TRANSMITTERS — Telephone


Airplane & Marine Instruments, Inc., Clearfield, Pa.

Bendix Radio Div., Bendix Aviation Corp., Wayne, Ind.

Dine & Co., Inc., F. E., 2221 Warwick Ave., Santa Monica, Calif.

Farindraft Television & Radio Corp., Ft. Wayne, Ind.

Hallcrafters Co., 4401 W. Fifth Ave., Chicago 24, Ill.

Radio Corp. of America, RCA Victor Div., Camden, N. J.

See Advertisements on Pages 80A, 80B

Transmitter Equipment Co., Inc., 345 Hudson St., New York 14, N. Y.

West Coast Electronics Co., 1501 S. Burton- 

ing St., Los Angeles 6, Calif.

WESTWOOD ELECTRIC CO., INC... 195 BROADWAY, NEW YORK 7, N. Y.

TRANSMITTERS — uhf

American Radio Co., 611 E. Garfield Ave., Chicago 6, Ill.

S - W Inductor Co., 1056 N. Wood St., Chicago, Ill.

Hillburn Electronic Products Co., 132 E. 64th St., New York 2, N. Y.

Kaar Engineering Co., 619 Emerson St., Hempstead, N. Y.

Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

Searle, Aero Industries, Inc., Orange, Calif.

Spray & Co., Inc., 1000 S. E. 2nd St., Fort Lauderdale, Fla.

L. I., N. Y.

See Advertisements on Pages 88, 89

Westinghouse Electric Corp., Industrial Electronics Div., Baltimore, Md.

TRANSMITTERS — TV


Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.

See Advertisements on Pages 48A to 48D

TRANSMITTERS — Time Modulation

Federal Telephone and Radio Corp., 100 Kingsland Rd., Clifton, N. J.

See Advertisements on Pages 48A to 48D

Telegraphy Projects, Inc., 24 Walnut St., Camden 3, N. J.

Sherron Electronics Co., 1201 Flushing Ave., Brooklyn 6, N. Y.

Brooklin Television Projects, Inc., 24 Walnut St., Newark, N. J.

Westinghouse Electric Corp., Industrial Electronics Div., Baltimore, Md.

TRAPS—Wave

Essery Electronics, 1600 Broad St., Newark 2, N. J.

See Advertisement on Page 241

Hillburn Electronic Products Co., 1 Work St., New York 13, N. Y.

King Electronics, Inc., 372 Classon Ave., Brooklyn 8, N. Y.

Miller Electronic Co., 1597 S. Main St., Los Angeles 6, Calif.

Pearsall Engineering & Research Corp., The Forest Park, Ill.

S-W Inductor Co., 1056 N. Wood St., Chicago 32, Ill.

TRIMMERS— Capacitors

See Capacitors

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June, 1947—MID-MONTH—ELECTRONICS BUYERS GUIDE
TUBES—Industrial
Amperex Electronic Corp., 25 Washington St., Brooklyn, N. Y.
Chatham Electronics, 475 Washington St., New York 14, N. Y.

TUBES—Phototubes and Photocells
Bradley Laboratories, 82 Meadow St., New Haven, Conn.

TUBES—Receiving
Chatham Electronics, 475 Washington St., New York 14, N. Y.

TUBES—Rectifying
Raytheon Mfg. Co., Power Tube Div., Wal-
ham 54, Mass.

TUBES—RF Amplifiers
Raytheon Mfg. Co., Power Tube Div., Wal-
ham 54, Mass.

TUBES—RF Transformers
Hytron Radio & Electronics Corp., 76 La-
fayette St., Salem, Mass.

TUBES—Sonic Gas-Filled
Ballantine Labs., Inc., Boonton, N. J.

TUBES—Superheated Gas-Filled
Ballantine Labs., Inc., Boonton, N. J.

TUBES—Vacuum
Ballantine Labs., Inc., Boonton, N. J.
TUNING - Transmitter
See Advertisement on Page 65

TUNERS - Klystron
Sperry Gyroscope Co., Inc., Great Neck, L. I., N. Y.
See Advertisements on Pages 80A, 80B

TUNERS - Permeability
Aeromotive Equipment Corp., 1522-8 Central St., Kansas City 10, Mo.
Allied Radio Industries, 501 W. 35th St., Chicago 18, Ill.
Aviala Radio Corp., Phoenix, Arizona
Blackburn, R. C., 24 W. 25th St., Indianapolis 4, Ind.
Essex Electronics, 1600 Broad St, Newark 2, N. J.
Mako Co., Inc., 36 N. 36th St., Minneapolis, Minn.
Mills & Rhode, Inc., 5917 S. Main St., Los Angeles, Calif.
Racor Engineering Corp., 99 Wall St., New York 5, N. Y.

TUNING DEVICES - Receiver Mechanical
Aeromotive Equipment Corp., 1522-8 Central St., Kansas City 10, Mo.
Collins Audio Products Co., 126 Park St., Westfield, N. J.
See Advertisement on Page 253
Collins Radio Engineers, Iowa
See Advertisements on Pages 30 to 33
Cromer Engineering, 3701 Ravenswood Ave., Chicago, Ill.
General Instrument Corp., 289 Newark Ave., Elizabeth 3, N. J.
See Advertisement on Page 71
Hammard Mfg. Co., 460 W. 34th St., New York 1, N. Y.
La Magna Mfg. Co., Inc., East Rutherford, N. J.
Maguire Industries Inc., Electronics Dept., Millwood Bridgeport, Conn.
Mallory & Company, Inc., P. R. 3329 E. Washington St., Indianapolis 6, Ind.
See Advertisements on Pages 25 to 260
See Advertisement on Page 44
See Advertisement on Page 78
Radio Corporation of America, Yates Engineering Services, Two Hampton Rd., Cranford, N. J.
TUNING DEVICES - Transmitter Mechanical
Barker & Williamson, 236 Fairchild Ave., Upper Darby, Pa.
See Advertisements on Pages 30 to 33
See Advertisement on Page 87
Mitchell Rand Insulation Co., Newark, N. J.
See Advertisement on Page 166
Mitchell Rand Insulation Co., Inc., 51 Murray St., New York 7, N. Y.
See Advertisement on Page 173
National Varnished Co., Inc., 211 Randolph Ave., Woodbridge, N. J.
See Advertisement on Page 249
Saxonburg Pottery, Saxonburg, Pa.

TUNING - Varied Camibic Insulation
See Advertisement on Page 65

TUNERS - f-m/a-m
Browning Labs., Inc., 750 Main St., Winchendon, Mass.
See Advertisement on Page 65

VACUUM UNITS
See Advertisements on Pages 25 to 260
See Advertisement on Page 28
Transmitter Equipment Co., Inc., 340 Hudson St., New York 14, N. Y.

TUNING DEVICES - Tunable Units
Eastern Electromagnetic, Inc., 41 Chestnut St., New Haven, Conn.
General Electric Co., Taylor & Oliva Sts., Elyria, Ohio
Magnetic Products Corp., The, Norwalk, Conn.
Maguire Industries Inc., Electronics Dept., Bridgeport, Conn.
Robinson Recording Labs., 2922 Sansom St., Philadelphia, Pa.

TUNTING - Recording and Transcription
Alliance Mfg. Co., 160 Park Blvd., Alliance, Ohio
Allied Recording Products Co., 21-09 43rd St., Long Island City, N. Y.
Clark Radio Equipment Co., 4178 Waco Ave., Chicago 18, Ill.
Collins Radio Co., Elkhart, Ind.
See Advertisements on Pages 30 to 33
Eastern Electromagnetic, Inc., 41 Chestnut St., New Haven, Conn.
Elliott Industries, Inc., 159 W. Slavson Ave., Los Angeles 6, Calif.
Fairchild Camera & Instrument Corp., 88-06 Van Wrick Blvd., Jamaica 1, N. Y.
Fliche Photo Corp., Velvetown Div., 3 Esopus Creek Rd., Wappingers Falls, N. Y.
Gate Radio Co., 123 Hampton St., New York 20, N. Y.
General Industries Co., Taylor & Oliva Sts., Elmsford, N. Y.
Harris Mfg. Co., 2422 W. Seventh St., Los Angeles 5, Calif.
Makan Inc., 727 Thurman Ave., Columbus 6, Ohio
Presco Recording Corp., 245 W. 35th St., New York 1, N. Y.
Radio Corp. of America, RCA Victor Div., Camden, N. J.
See Advertisements on Inside Back Cover, Back Cover & 251
Radio Labs., Inc., 35-54 31st St., L. I., City, N. Y.
Radio Music Corp., East Port Chester, Conn.
See Advertisement on Page 315
Reo-Kraft Records, Grand St., New York 13, N. Y.
See Advertisement on Page 245
Robinson Recording Labs., 2922 Sansom St., Philadelphia, Pa.
Rome Industries, Inc., 150 Monroe St., Toledo 6, Ohio
Sonora Radio & Television Corp., 235 N. Hoyne Ave., Chicago 31, Ill.
Technicon Products, Inc., 900 Hudson St., New York 13, N. Y.
Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.
See Advertisements on Pages 88, 89

VACUUM GAGES
See Gages, Vacuum or Pirani

VACUUM INDICATING, RECORDING AND CONTROL EQUIPMENT
Bailey Meter Co., 1044 Ivanhoe Rd., Cleveland 10, Ohio
Bristol Metro, The Waterbury 81, Conn.
Distillation Products Inc., 765 Ridge Rd., Rochester, N. Y.
Eco High Pressure Corp., 7020 Hudson Blvd., North Bergen, N. J.

Radio Corp. of America, Tube Div., Hartford, Conn.
Vacuum Electronic Engineering Co., 277 M. 2nd, Brooklyn 2, N. Y.
Winlow Co., 5 Liberty St., Newark 5, N. J.

VACUUM PUMPS - High
Beach-Russ Co., 50 Church St, New York 7, N. Y.
California Turbine Corp., 540 39th St., Union City, N. J.
See Advertisement on Page 35
Central Scientific Co., 1790 Irving Park Blvd., Chicago 13, Ill.
Distillation Products, Inc., 755 Ridge Rd., Westerly, N. Y.
Elgin Engineering Div., 740 S. 13th St., Newark 3, N. J.
Frederic Controls, Inc., 2422 W. 3rd St., Los Angeles 3, Calif.
General Products, Inc., 61 Allen Ave., Glendale, Calif.

VACUUM - Pipe Valves
See Advertisement on Page 186
Kahlke Engineering Co., 1907 Seventh St., North Bergen, N. J.
Leiman Bros., 303 Christie St., Newark 3, N. J.
Rittenhouse Laboratories, Redwood City, Calif.
Process & Instrument, 60 Greenpoint Ave., Brooklyn 22, N. Y.
Radio Corp. of America, RCA Victor Div., Camden, N. J.
See Advertisements on Inside Back Cover & Back Cover, 251

VALVES - Solenoid
Alsco Valve Co., 865 Kingston St., St. Louis 6, Mo.
Electric Control Valve Co., Inc., 395 broadway, St. Louis 15, Mo.
Eisler Engineering Co., 395 Broadway, St. Louis 15, Mo.
See Advertisement on Page 186
Federer manuf. Co., Inc., 41 E. 11th St., Chicago 5, Ill.
Radiation Products, Inc., 755 Ridgeway Road, Rochester, N. Y.
See Advertisement on Page 186

YARNISH CAMBIC COATINGS
See Insulating Compounds

VIBRATION ANALYSIS EQUIPMENT
Consolidated Engineering Corp., 595 E. Colorado St., Pasadena 1, Calif.

1947-1948 DIRECTORY
WASHERS—Insulating

Astina Felt Co., Centre & Hester Sts., New York 13, N. Y.
American Felt Co., Genville, Conn.
American Lava Corp., Chattanooga 5, Tenn.
American Fiberglas Corp., 2907 S. Main St., Louisville 1, Ky.
Baker Co., Inc., 5, Montgomery St., Hillsville, N. J.

See Advertisement on Page 76

WASHERS—Lock

Allmetal Screw Products Co., 80 Grand St., New York 38, N. Y.
American Nut & Bolt Fastener Co., 2045 Doerr St., Pittsburgh, Pa.
Autocrew Co., 216-222 W. 18th St., New York 13, N. Y.
Belmont Smelting & Refining Works, Inc., 2910 W. 58th St., Kansas City 15, Mo.
Borg-Warner Corp., 1604 W. Montana Ave., Los Angeles 19, Calif.
Chase Brass & Copper Co., Inc., Waterbury 5, Conn.
Clendenor Bros., 185 South St., Baltimore, Md.
Corbin Screw Div., Amer. Hardware Corp., High Bridge & Grove Sts., New Brunswick, Conn.
Federal Screw Prod. Co., 224 W. Huron St., Chicago 6, Ill.
Franklin Airloop Corp., 43-20 34th St., Long Island City, N. Y.
Gardiner Mfg. Co., 2711 Union St., Oak Park, Ill.

See Advertisement on Page 61

Gasket Engineering Co., 2340 Charlotte St., Kansas City 6, Mo.

See Advertisement on Page 87

Insulation Corp. of America, 36-02 35th Ave., Long Island City, N. Y.

See Advertisement on Page 106

Kellogg Steel Prod. & Supply Co., 6600 S. Cicero Ave., Chicago 38, Ill.
Keyes Mfg. Co., 50-50 Franklin St., New York 13, N. Y.
Kirchberg & Co., Inc., 1435 37th St., New York 1, N. Y.
Laminoid Fabricators, 2600 W. Potomac Ave., Chicago 22, Ill.
Machrath Supply & Gasket Co., Tioga St. & Argonne Ave., Chicago 10, Ill.
Moors Co., Howard J., 105 Park Row, New York 7, N. Y.
Mykro Insul Inc., 1117 N. Springfield Ave., Chicago 47, Ill.
National Vulcanized Fibre Co., Wilmington, Del.

See Advertisement on Page 108

Penn Fibre & Specialty Co., 2699 E. Westmoreland St., Philadelphia 44, Pa.
Pennsylvania Mfg. Co., 120 N. Pittsburgh St., Rochester, N. Y.
Pennell, C. R., 901 S. Michigan Ave., Chicago, Ill.

See Advertisement on Page 161

Spaulding Fibre Inc., 310 S. Wabash Ave., Chicago, Ill.

See Advertisement on Page 114

Willard's, Hampden, Mass.

See Advertisement on Page 101

WASHINGTON—Electrostatic

Electronic Measurements Co., Red Bank, N. J.
Ferranti Electric Inc., 30 Rockefeller Plaza, New York 20, N. Y.
See Advertisement on Page 78

See Advertisement on Page 116

General Electric Co., Schenectady 5, N. Y.
See Advertisement on Page 25

General Electric Co., 1440 W. 33rd St., Omaha 11, Nebraska

Potter & Brumback Co., Red Bank, N. J.

See Advertisement on Page 68

General Electric Co., Schenectady 5, N. Y.

See Advertisements on Pages 90B, 96C

See Advertisement on Page 193

New York 13, N. Y.

General Electric Co., Syracuses, N. Y.

See Advertisement on Page 244

Rexine Electrical Co., 152 W. 25th St., New York, N. Y.

See Advertisement on Page 244

Robin-Burgess Co., 5002 N. 30th St., Omaha 2, Nebraska


Shilling Electronics Co., 1501 Flushing Ave., Brooklyn 6, N. Y.

Simplex Electric Co., 6218 W. Kinzie St., Chicago 44, Ill.

Star Measurements Co., 442 East 166th St., New York 38, N. Y.

Sterling Mfg. Co., 9205 Detroit Ave., Cleveland 8, Ohio

Superior Instruments Co., 227 Fulton St., New York 7, N. Y.

Supreme Rubber Co., Inc., Greenwood, Miss.

Systematic Electronics Prod., 506 8th Ave., New York 11, N. Y.

New York 18, N. Y.

See Advertisements 10B to 161

Triplet Electrical Instrument Co., 244 Harrow Rd., Bluffton, Ohio

Triplet Instrument Co., Van Buren St., Chicago 7, Ill.

Waterford Electrical Co., Meter Div., Newark, N. J.

Weston Electrical Instrument Co., 618 Frelingenhouse Ave., Newark 2, N. J.

WASHING—Metal

Allmetal Screw Prod. Co., 20 Grand St., New York 38, N. Y.
American Nut & Bolt Fastener Co., 2045 Doerr St., Pittsburgh, Pa.
Autocrew Co., 216-222 W. 18th St., New York 13, N. Y.

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**WIRE**

**WIRE—Copper**

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<thead>
<tr>
<th>Company Name</th>
<th>Address</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Alpha Wire Corp.</td>
<td>50 Howard St., New York 10, N. Y.</td>
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<tr>
<td>American Steel &amp; Wire Co., U. S. Steel</td>
<td>Holyoke, Mass.</td>
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<tr>
<td>Birnbach Radio Co., Inc.</td>
<td>145 Hudson St., New York 7, N. Y.</td>
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**WIRE—Metalized**

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<tr>
<th>Company Name</th>
<th>Address</th>
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<tbody>
<tr>
<td>General Electric Co.</td>
<td>1355 S. Clinton St., Chicago 16,</td>
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<tr>
<td>General Electric Co.</td>
<td>50 Howard Ave., New York 16, N. Y.</td>
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<tr>
<td>General Electric Co.,</td>
<td>26 Camp St., Newark 5, N. J.</td>
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<td>General Electric Co.,</td>
<td>5784 N. Ethen Ave., Chicago 30,</td>
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**WIRE—Rubber Insulated**

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<tr>
<th>Company Name</th>
<th>Address</th>
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<tr>
<td>American Electric Wire &amp; Cable Co.,</td>
<td>44 Summer Ave., Chicago 30, Ill.</td>
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<tr>
<td>Anacona Wire &amp; Cable Co.,</td>
<td>25 Broadway, New York 7, N. Y.</td>
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<tr>
<td>Anacona Wire &amp; Cable Co.,</td>
<td>5784 N. Ethen Ave., Chicago 30,</td>
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<tr>
<td>Birnbach Radio Co., Inc.</td>
<td>145 Hudson St., New York 7, N. Y.</td>
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**WIRE—Stainless Steel Insulated**

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<th>Company Name</th>
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**WIREMETERS**

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<tr>
<th>Company Name</th>
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<tr>
<td>3rd Electronic Corp.</td>
<td>1800 E. 33rd St., Pittsburgh, Pa.</td>
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<tr>
<td>Esterline-Angus Co., Inc.</td>
<td>P. O. Box 158, Rockville, Md.</td>
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<td>General Electric Co.,</td>
<td>Schenectady 5, N. Y.</td>
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<tr>
<td>General Electric Co.,</td>
<td>26 north Ave., New York 16, N. Y.</td>
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<tr>
<td>Hazenbell Electrical Instrument Co.,</td>
<td>10514 66th St., Chicago 12, Ill.</td>
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<td>Hoffman Electric Co.,</td>
<td>10801 N. Kedzie Ave., Chicago 10,</td>
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<tr>
<td>Hollon Wire &amp; Cable Co.,</td>
<td>595 W. Kinsale Ave., Chicago 44,</td>
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<td>Sony Electric Instrument Co.,</td>
<td>Great Neck, N. Y.</td>
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**WAXES**

See Insulating Compounds

**WEDGES—Wood Slot**

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<th>Company Name</th>
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<tr>
<td>Robert &amp; Hopper,</td>
<td>225 Varick St., New York, N. Y.</td>
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<td>J. P. Sruage Works, Third National</td>
<td>Bladg., Dayton 2, Ohio</td>
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<tr>
<td>Continental-Diamond Fibre Co.,</td>
<td>16 Chapel St., Newark 2, N. J.</td>
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<td>Insulation Mfrs. Corp.</td>
<td>875 W. 13th St., Chicago 18, Ill.</td>
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**WELDERS—Electronic Controlled**

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<th>Company Name</th>
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<tr>
<td>Davis &amp; Murphy,</td>
<td>2292 Broadway, Chicago, Ill.</td>
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<tr>
<td>Electric Engineering Co., Inc.</td>
<td>746 S. 13th St., Newark 3, N. J.</td>
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<td>Electronic Co.,</td>
<td>44 Summer Ave., Newark, N. J.</td>
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<td>Electronic Power Co., Inc.</td>
<td>18 W. 44th St., New York, N. Y.</td>
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<td>Inokley Bros.</td>
<td>4915 W. 67th St., Chicago 37, Ill.</td>
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<td>Panfroco Corp.,</td>
<td>The 87 Washburn St., Bridgeport, Conn.</td>
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**WINDING MACHINES, COIL**

See Coil Winding Machines

**WIRE—Annunciation**

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<th>Company Name</th>
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<tr>
<td>Federal Telephone &amp; Radio Corp.</td>
<td>100 Kingsland Rd., N. Y.</td>
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<tr>
<td>See Advertisements on Pages 48A to 48D</td>
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<tr>
<td>Insignia of America,</td>
<td>36-02 35th Ave., Long Island City, N. Y.</td>
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**WIRE—Antenna**

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<th>Company Name</th>
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<tr>
<td>Alloy Metal Wire Co.</td>
<td>Prospect Park, N. Y.</td>
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<tr>
<td>American Phenolic Corp.,</td>
<td>1830 S. 34th Ave., Chicago 50, Ill.</td>
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<td>Anacona Wire &amp; Cable Co.,</td>
<td>25 Broadway, New York 7, N. Y.</td>
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<tr>
<td>Birnbach Radio Co., Inc.</td>
<td>145 Hudson St., New York, N. Y.</td>
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<tr>
<td>Consolidated Wire &amp; Associated</td>
<td>Companies, 1835 S. Clinton St., Chicago 16, Ill.</td>
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<td>Cornish Wire Co.,</td>
<td>15 Park Row, New York, N. Y.</td>
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<td>Diamond Wire &amp; Cable Co.,</td>
<td>128 E. 16th St., Chicago 18, Ill.</td>
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<td>Federal Telephone and Radio Corp.,</td>
<td>100 Kingsland Rd., N. Y.</td>
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<td>Insuline Corp. of America,</td>
<td>36-02 35th Ave., Long Island City, N. Y.</td>
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<td>Interstate Wire &amp; Cable Co.,</td>
<td>Chicago 30, Ill.</td>
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<td>Lenz Electric Mfrg. Co.,</td>
<td>136 S. Clinton St., Chicago 16, Ill.</td>
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<td>Metal Wire</td>
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<td>Plastic Wire &amp; Cable Co., Norwich, Conn.</td>
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<td>Plasflex Corp.</td>
<td>19 W. 44th St., New York, N. Y.</td>
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<td>Runkel Wire &amp; Cable Co.,</td>
<td>4731 W. Montrose Ave., Chicago, Ill.</td>
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ELECTRONIC and ALLIED PRODUCTS

X-RAY EQUIPMENT

WIRE—Nickel Clad Copper
Alloy Metal Wire Co., Prospect Park, (Moore Sta.), Pa.
Baker & Co., 113 Astor St., Newark 5, N. J.
Calitrite Tungsten Corp., 450 39th St., Union City, N. J.
See Advertisement on Page 45

WIRE—Phosphor Bronze
Alpha Wire Corp., 50 Howard St., New York, N. Y.
American Electric Cable Co., Holyoke, Mass.
Baker & Co., 113 Astor St., Newark 5, N. J.
Sibbach Radio, Inc., 115 Hudson St., New York, N. Y.
Calitrite Tungsten Corp., 450 39th St., Union City, N. J.
Chase Brass and Copper Co., Inc., Waterhouse Electric Wire & Cable Co., Paterson 1, N. J.
Riverdale Metal Co., Riverside, N. J.

WIRE—Plastic Insulated
Alpha Wire Corp., 50 Howard St., New York, N. Y.
American Electric Cable Co., Holyoke, Mass.
American Electric Wire & Cable Corp., 1839 S. 54th Ave., Chicago 50, Ill.
See Advertisement on Page 23
American Steel & Wire Co., U. S. Steel Corp., 276 4th Ave., New York
Boston Insulated Wire & Cable Co., 63 Bay St., Brooklyn, N. Y.
Carrigan & Co., Wm., 276 4th Ave., New York
Fansteel Metallurgical Corp., 2200 Sheridan Rd., Chicago, Ill.
Federal Telephone and Radio Corp., 100 E. 42nd St., New York, N. Y.
General Electric Co., Schenectady, N. Y.
Kelley-Koett Mfg. Co., Inc., 100 E. 42nd St., New York, N. Y.
Kleen_enemy Blake Co., New Haven, Conn.
Kleinety Blake Co., New Haven, Conn.

WIRE—Shielded
Adson Metals, 117 No. Main St., Brockport, N. Y.
American Electric Wire & Cable Corp., 450 Howard St., New York, N. Y.
American Electric Cable Co., Holyoke, Mass.
American Electric Wire & Cable Corp., 1839 S. 54th Ave., Chicago 50, Ill.
American Insulated Wire Corp., 125 N. Elson Ave., Chicago, Ill.
Baker & Co., 113 Astor St., Newark 5, N. J.
Boston Insulated Wire & Cable Co., 63 Bay St., Brooklyn, N. Y.
Bosford & Co., Wm., 276 4th Ave., New York, N. Y.
Bosford & Co., Wm., 276 4th Ave., New York, N. Y.
Consolidated Wire & Associated Companies, 630 Purchase St., Boston 25, Mass.
Columbia Wire & Supply Co., 7354 N. Elson Ave., Chicago, Ill.
Essex Wire, 1691 Wall St., Fort Lee, N. J.
Federal Telephone and Radio Corp., 100 E. 42nd St., New York, N. Y.
Columbia Wire & Supply Co., 7354 N. Elson Ave., Chicago, Ill.
Consolidated Wire & Associated Companies, 630 Purchase St., Boston 25, Mass.
Columbia Wire & Supply Co., 7354 N. Elson Ave., Chicago, Ill.
Consolidated Wire & Associated Companies, 630 Purchase St., Boston 25, Mass.
See Advertisement on Page 170
Diamond Wire & Cable Co., 123 East 18th St., Chicago, Ill.
Essex Wire, 1691 Wall St., Fort Lee, N. J.
Federal Telephone and Radio Corp., 100 E. 42nd St., New York, N. Y.
General Electric Co., Schenectady, N. Y.
See Advertisement in Pages 48A to 48D
General Electric Co., Schenectady, N. Y.
See Advertisement in Pages 96B, 96C
Insuline Corp. of America, 36-40 35th Ave., Long Island City, N. Y.
Invisacord Co., 100 E. 42nd St., New York, N. Y.
Invisacord Co., 100 E. 42nd St., New York, N. Y.
Rome Cable Co., 330 Ridge St., Trenton, N. J.
Rome Cable Co., 330 Ridge St., Trenton, N. J.
See Advertisement on Page 89
Simplex Wire & Cable Co., 79 Sidney St., Boston, Mass.
Simplicon Electrical Insulation Co., 84 Purchase St., Boston, Mass.
Simplicon Electrical Insulation Co., 84 Purchase St., Boston, Mass.
Simplicon Electrical Insulation Co., 84 Purchase St., Boston, Mass.
Simplicon Electrical Insulation Co., 84 Purchase St., Boston, Mass.
Simplicon Electrical Insulation Co., 84 Purchase St., Boston, Mass.
See Advertisement on Page 89
Runzel Cord & Wire Co., 4721 W. Monroe St., Chicago, Ill.
Webster Electric Co., 1900 Clark St., Chicago, Ill.

WIRE—Silver Plated
Baker & Co., 113 Astor St., Newark 5, N. J.
Federal Telephone and Radio Corp., 100 E. 42nd St., New York, N. Y.
See Advertisement in Pages 48A to 48D
Federal Telephone and Radio Corp., 100 E. 42nd St., New York, N. Y.
General Insulated Wire Works Inc., 69 Garrison Ave., New Haven, Conn.
Little Falls Alloys Inc., 159 Caldwell Ave., Newark, N. J.
North American Philips Co., Inc., 400 E. 42nd St., New York 17, N. Y.

WIRE—Stainless Steel
Aircraft Screw Products Co., Inc., 47-63 30th St., Wilmette, Ill.
American Electric Wire & Cable Co., 4111 Ft. Hamilton Pkwy., Brooklyn, N. Y.
American Electric Wire & Cable Co., 4111 Ft. Hamilton Pkwy., Brooklyn, N. Y.
American Electric Wire & Cable Co., 4111 Ft. Hamilton Pkwy., Brooklyn, N. Y.
American Electric Wire & Cable Co., 4111 Ft. Hamilton Pkwy., Brooklyn, N. Y.
American Electric Wire & Cable Co., 4111 Ft. Hamilton Pkwy., Brooklyn, N. Y.

WIRE—Tungsten
Baker & Co., 113 Astor St., Newark 5, N. J.
Columbia Wire & Supply Co., 7354 N. Elson Ave., Chicago, Ill.
Cleveland Tungsten, Inc., 10526 Meech Ave., Cleveland, Ohio
Fansteel Metallurgical Corp., 2200 Sheridan Rd., Chicago, Ill.
North American Philips Co., Inc., 100 E. 42nd St., New York, N. Y.
Sylvania Electric Products Inc., 500 5th Ave., New York, N. Y.

WIRE RECORDER ASSEMBLIES
Aurex Corp., 1117 N. Franklin St., Chicago, Ill.
Bruck Development Co., The, 3405 Perkins Ave., Cleveland, Ohio
General Insulated Wire & Cable Co., Inc., 69 Garrison Ave., New Haven, Conn.
Magnecord, Inc., 304 W. 63rd St., Chicago, Ill.
See Advertisement on Page 192
Powell & Co., Inc., R. C., 57 William St., New York, N. Y.
Rowe Industries, 3120 Monroe St., Toledo 6, Ohio
Runzel Cord & Wire Co., 4721 W. Monroe St., Chicago, Ill.
Webster Electric Co., 1900 Clark St., Chicago, Ill.
Wis-Recorder Corp., 1807 Stroh Bldg., Detroit 26, Mich.

X-RAY EQUIPMENT—Industrial
du Pont de Nemours & Co., Inc., E. L. Williams, N. Y.
North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Packer X-Ray Corp., 300 Fourth Ave., New York 10, N. Y.
St. John X-Ray Laboratory, Califon, N. J.
Westinghouse Electric Corp., Industrial Electronics Div., Baltimore, Md.

X-RAY EQUIPMENT—Medical
du Pont de Nemours & Co., Inc., E. L. Williams, N. Y.
North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Packer X-Ray Corp., 300 Fourth Ave., New York 10, N. Y.
St. John X-Ray Laboratory, Califon, N. J.
Westinghouse Electric Corp., Industrial Electronics Div., Baltimore, Md.

X-RAY EQUIPMENT—Industrial
du Pont de Nemours & Co., Inc., E. L. Williams, N. Y.
North American Philips Co., Inc., 100 E. 42nd St., New York 17, N. Y.
Packer X-Ray Corp., 300 Fourth Ave., New York 10, N. Y.
St. John X-Ray Laboratory, Califon, N. J.
Westinghouse Electric Corp., Industrial Electronics Div., Baltimore, Md.
The following list, provided by manufacturers, comprises the registered trade names of products in or related to the electronic field. It is intended for use in determining the manufacturer's name when only a trade name is known. Addresses can be obtained by referring to the Manufacturers Index on page D-134.

Only coined trade names are listed, as it was deemed unnecessary to include a company name, even though it was a registered trade name, inasmuch as the manufacturer's identity was immediately apparent.

### Trade Name Index

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<td>Acratite Insulated Wire Corp.</td>
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<td>ACE</td>
<td>American Hard Rubber Co.</td>
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<td>ACOUSICEL</td>
<td>Bausch Development Co.</td>
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<td>ACKAWAX C</td>
<td>Glyco Products Co., Inc.</td>
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<td>AC-OUT</td>
<td>Acromark Co.</td>
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<td>ACROBAYE</td>
<td>Aerocorp Co.</td>
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<td>ACROFLEX</td>
<td>Anchor Plastics Co., Inc.</td>
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<td>ACROMARK</td>
<td>American Lava Corp.</td>
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<td>ACRO PLAC</td>
<td>Alumaweld</td>
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<td>ACROSNAP</td>
<td>Alumaweld, Inc.</td>
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<td>ACRO TOOL</td>
<td>Alco Electric Co.</td>
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<td>ACMET</td>
<td>All-Weather Radio Guide</td>
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<td>ACRAWAX C</td>
<td>American Lava Corp.</td>
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<tr>
<td>AUDIODICS</td>
<td>Audio-Video Measurements, Inc.</td>
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<td>AUDIGAGE</td>
<td>Branson Instruments, Inc.</td>
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<td>AUDIOPHILE</td>
<td>Audio Devices, Inc.</td>
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<td>AUDIONIC</td>
<td>Berendt Corp., E. M. Audionics Div.</td>
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<td>AURICRON</td>
<td>Baker &amp; Co.</td>
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<td>AUSRAL</td>
<td>Bausch &amp; Lomb Co.</td>
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<td>AUSTHOTECH</td>
<td>Bausch &amp; Lomb Co.</td>
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<td>AVOPLATE</td>
<td>Bausch &amp; Lomb Co.</td>
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<td>BAJ-CO</td>
<td>Barber Colman Co.</td>
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<tr>
<td>BAYCOM</td>
<td>Bausch &amp; Lomb Co.</td>
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<td>BEACON</td>
<td>Beall Manufacturing Co.</td>
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<td>BEETLE</td>
<td>American Cyanamid Co.</td>
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<td>BELCO</td>
<td>Bonus Electric Co.</td>
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<td>BELLONE</td>
<td>Bellone Electric Co.</td>
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<td>BELL-MARK</td>
<td>Bellone Electric Co.</td>
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<tr>
<td>BELL-TIME</td>
<td>Belltime, Inc.</td>
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<tr>
<td>BEN HAY</td>
<td>Bentley, Harris Mfg. Co.</td>
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<td>BENTO-MAR</td>
<td>Bentol Manufacturing Co.</td>
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<td>BIMORPH</td>
<td>Bimorph, Inc.</td>
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<td>BIGO</td>
<td>Bigo Manufacturing Co.</td>
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<td>BRASOR</td>
<td>Brasor Manufacturing Co.</td>
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<td>BRISTO</td>
<td>Bristol Co., The</td>
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<td><strong>ECKCO</strong> Eokakint Radio &amp; Television Co.</td>
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<td><strong>ESNA</strong> Elastic Stop Nut Corp. of America</td>
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<tr>
<td><strong>EAGLE EYES</strong> Farrirmore Sales Co.</td>
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<tr>
<td><strong>ECCO</strong> Triad Transformer Mfg. Co.</td>
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<tr>
<td><strong>EDITION</strong> Edision, Inc., Thomas A.</td>
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<tr>
<td><strong>EDTOMIC</strong> Electronic Designs, Inc.</td>
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<td><strong>ETN</strong> Electron Supply Co.</td>
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<td><strong>EDVOR</strong> Educro Mfg. Co.</td>
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<td><strong>EFFARSEE</strong> Electric Radio Co.</td>
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<td><strong>ELECT-O-MATIC</strong> Multi-Products Tool Co.</td>
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<td><strong>ELOSTEBOND</strong> Fisher Products Inc.</td>
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<td><strong>ELGENTONE</strong> Northeastern Engineering Inc.</td>
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<td><strong>EMIO</strong> Electro Labs., Inc.</td>
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<td><strong>ENERTOX</strong> Gorrell &amp; Gorrell</td>
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<td><strong>ELECTRIET</strong> West Virginia Pulp &amp; Paper Co. Pull Products Dept.</td>
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<td><strong>ELECTRO-CAL</strong> Industrial Electronics, Inc.</td>
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<td><strong>ELECTRO-EAR</strong> American Earphone Co.</td>
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<td><strong>ELECTRO-MET</strong> Precision Apparatus Co.</td>
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<tr>
<td><strong>ELECTRO-SET</strong> Anamontea Clock Co., Inc.</td>
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<tr>
<td><strong>ELECTRO-THERM</strong> Thermionic Engr. Corp.</td>
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<tr>
<td><strong>ELECTRO-THERMOMETER</strong> Fisher Scientific Co.</td>
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<tr>
<td><strong>ELECTROFIRE</strong> Harriss Mfg. Co.</td>
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<tr>
<td><strong>ELECTRO-MATIC</strong> Automatic Signal Div., Eastern Industries, Inc.</td>
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<tr>
<td><strong>ELECTROPLATING</strong> Electro-Metallurgical Co., Div. of Union Carbide &amp; Carbon Corp.</td>
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<td><strong>ELECTRON-A-BOND</strong> Electronic Chemical Engineering Co.</td>
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<td><strong>ELECTRON-SEAL</strong> Electronic Chemical Engineering Co.</td>
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<td><strong>ELECTRON TONE</strong> Electronic Chemical Engineering Co.</td>
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<td><strong>ELECTRONIC</strong> Brown Instrument Co.</td>
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<td><strong>ELECTRONIQUE</strong> Electronic Chemical Engineering Co.</td>
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<td><strong>ELECTROPHOT</strong> Adam &amp; Khanine</td>
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<td><strong>ELECTROPHOTOMETER</strong> Clow Scientific Co.</td>
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<td><strong>ELECTRO-VANE</strong> Brown Instrument Co.</td>
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<td><strong>ELECTROX</strong> Schruer Machne Co.</td>
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<td><strong>ELECTMIC</strong> Electronic Enterprises, Inc.</td>
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<td><strong>ELENCO</strong> Electric Indicator Co.</td>
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<td><strong>ELMER</strong> North American Philips Co., Inc.</td>
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<td><strong>ENPACT</strong> Magnetic Devices Corp.</td>
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<td><strong>ENICO</strong> Electro-Mechanical Instrument Co.</td>
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<td><strong>EMPAC</strong> Electronic Mechanical Products Co.</td>
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<td><strong>EMPIRE</strong> Mica Insulator Co.</td>
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<td><strong>ENAMELITE</strong> Acme Wire Co.</td>
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<td><strong>EPCO</strong> Davis &amp; Murphy</td>
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<td><strong>EPILAB</strong> Epiley Lab., Inc., The</td>
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<td><strong>EQUALOAD</strong> Keystone Carbon Co., Inc.</td>
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<td><strong>ERIE</strong> Erie Resistor Corp.</td>
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<td><strong>ETHCEL</strong> Dow Chemical Co.</td>
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<td><strong>ETHLON</strong> Marcalco American Phenolic Corp.</td>
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<td><strong>ETHESCHROM</strong> Eutic Welding Alloys Co.</td>
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<td><strong>EUTECNO</strong> Eutic Welding Alloys Co.</td>
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<td><strong>EUTECOR</strong> Eutic Welding Alloys Co.</td>
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<td><strong>EUTECTOR</strong> Eutic Welding Alloys Co.</td>
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<td><strong>EUTECTODE</strong> Eutic Welding Alloys Co.</td>
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<tr>
<td><strong>EVA-BRITE</strong> Bach &amp; Co., Semen</td>
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<td><strong>EVALITE</strong> Bach &amp; Co., Semen</td>
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<td><strong>EVERLOCK</strong> Thompson-Bremer &amp; Co.</td>
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<tr>
<td><strong>EXACT-IT PHOTO</strong> Photo Reproducing Equip. Co.</td>
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<tr>
<td><strong>EXAMET</strong> Solar Mfg. Corp.</td>
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<td><strong>EXIDE</strong> Electric Storage Battery Co.</td>
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<td><strong>EXPLAINEET</strong> Optical Mfg. Co.</td>
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<td><strong>F-A</strong> Pyramid Products Co.</td>
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<tr>
<td><strong>FASCO</strong> Smith Mfg. Co., F. A.</td>
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<td><strong>FASTAX</strong> Western Electric Co., Inc.</td>
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<td><strong>FATHOMETER</strong> Submarine Signal Co.</td>
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<td><strong>FAX</strong> Radio Inventions, Inc.</td>
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<td><strong>FAXIMILED</strong> Radio Inventions, Inc.</td>
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<td><strong>FEDICO</strong> Federal Engineering Co.</td>
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<td><strong>FEL-PAK</strong> Bell Products Mfg. Co.</td>
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<td><strong>FENCO</strong> Fisher Engineering &amp; Mfg. Co.</td>
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<td><strong>FENOX</strong> Bakesite Corp.</td>
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<td><strong>FERTILIZER</strong> W. S. Inductor Co.</td>
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<td><strong>FESTON</strong> Mensage Chemical Co. Plastics Div.</td>
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<td><strong>FILMITE</strong> Permo Inc.</td>
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<td><strong>FIFTEEN</strong> Fifty Five, Cardwell Mfg. Corp., Allen D.</td>
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<td><strong>FILMFLUX</strong> Miles Reproducer Co., Inc.</td>
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<td><strong>FILMICIC</strong> Reichmann, Driver-Harris Co.</td>
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<td><strong>FILMIEtte</strong> Deutschmann Corp., Tobe</td>
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<td><strong>FILTRONS</strong> Continental Carb., Tobe</td>
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<td><strong>FLIRE</strong> Baker-Phillips Co.</td>
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<td><strong>FLASH</strong> Fisher Products Inc.</td>
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<td><strong>FIREDROP</strong> Yardney Laboratories Inc.</td>
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<td><strong>FLEXFLAT</strong> Pailette Products Inc.</td>
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<td><strong>FLEXITONE</strong> Zephyr Ind. Mfg. Co.</td>
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<td><strong>FLEXTONE</strong> Fisher Mfg. Co.</td>
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<td><strong>FLEXIBLE</strong> Standard Pressed Steel Co.</td>
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<td><strong>FLORO-RECORD</strong> Eagle Signal Corp.</td>
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<td><strong>FLEX-O-SOFT</strong> Stupakoff Ceramic &amp; Mfg. Co.</td>
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<td><strong>FLIGHTWEIGHT</strong> Bendix Grind. Div.</td>
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<td><strong>FLOTROL</strong> Lomar Products Corp.</td>
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<td><strong>FLOWATORS</strong> Fisher &amp; Porter Co.</td>
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<td><strong>FLUORO-RECORD</strong> Fairchild Camera &amp; Instrument Corp.</td>
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<td><strong>FLUSH-LITE</strong> Littelfuse Inc.</td>
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<td><strong>FM-6</strong> General Controls Co.</td>
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<td><strong>F. N. A.</strong> Falley Products Inc.</td>
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<td><strong>FORMVAR</strong> Shavilgan Products Corp.</td>
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<td><strong>FORTICEL</strong> Colson-Plastics Corp.</td>
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<td><strong>FORTISAN</strong> Colsonas Corp. of America &quot;495&quot; ALLY.</td>
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<td><strong>FRANKM</strong> Magnetic Metals Co.</td>
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<td><strong>FRAHM</strong> Specialty Co., James G.</td>
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<td><strong>FREE-OUT INVAR</strong> Carpenter Steel Co.</td>
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<td><strong>FREE-VANE</strong> Brewer, The</td>
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<td><strong>FUSION</strong> Bussmann Mfg. Co.</td>
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<td><strong>FUSITE ERMETICANS</strong> Cincinnati Electric Products Co.</td>
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<td><strong>FUSTATS</strong> Bussmann Mfg. Co.</td>
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<td><strong>FHYDER</strong> Wilminghton Fibre Specialty Co.</td>
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**GALVANOID** Wickwire Spencer Steel & Div. Colorado Fuel and Iron Corp. |
**GALVEX** Wickwire Spencer Steel & Div. Colorado Fuel and Iron Corp. |
**GAMMATRON** Heit & Kaufman Ltd. |
**GARCEAU** Electro-Medical Lab., Inc. |
**GARCO** Gardiner Mfg. Co. |
**GELITA** Shawingan Products Corp. |
**GEMCOTT** Gemeloid Corp. |
**GENPLEX** Gemeloid Corp. |
**GENWELD** Gemeloid Corp. |
**GENMOST** Gemeloid Corp. |
**GEMSTONE** Knollher Chemical Co. |
**GEMWELD** Gemeloid Corp. |
**GENEMOTOR** Carter Motor Co. |
**GENVAC** Bendix Aviation Corp. Pacific Div. |
**GEON POLYVINYL CHLORIDE PLASTICS** General Chemical Co., V., F. |
**GEON POLYVINYL CHLORIDE RESINS** General Chemical Co., V., F. |
**GIBSILY** Gilson Electric Co. |
**GLADSHIR** Clearlstat Mfg. Co., Inc. |
**GLASS SERIES** "429", "499" |
**GLIDER** Sharel Brothers |
**GLOBAL** Molded Insulation Co. |
**GLORAB** Glorab Div. Carbon Carb. Corp. |
**GLORAG** Fischer & Porter Co. |
**GLYDAG** Acheson Coloids Corp. |
**GO-SET** Waterproof Electric Co. |
**GRACOIL** Grauer Co., The |
**GRAFO CONCENTRATE** Grafol Coloids Corp. |
**GRAPHAMET** Graphite Metallizing Corp. |
**GREENOHM** Clarostat Mfg. Co., Inc. |
**GRIP-HOLD** F. E. Mfg. Co. |
**GRIP-POINT** Vaco Products Co. |
**GRIP TIGHT** Paley Products Inc. |
**GRIPMASTER** Walker Co., George |
**GRIPRITE** Stevens-Walden Inc. |
**GRIP-X** Rattan Mfg. Co., The |
**GUN** Rowe Industries |
**Gyroco** Sperry Gyroscope Co. |
**GYSROSP** Sperry Gyroscope Co. |
**HAFTSON** Hart & Sons, Inc. |
**HALLOWELL** Standard Pressed Steel Co. |
**HALOWAX** Halowax Products Div. Union Carbide & Carbon Corp. |
**HANDI-PHONE** Trafton Co., Wm. J. |
**HANDY ANDY** Rattan Mfg. Co., The |
**HANDY-FLUX** Handy & Harman |
**HANDY WAR** Martinale Electric Co. |
**HAR-CAM** Harvey Radio Labs, Inc. |
**HASCROME** James Stellite Co. Unit of Union Carbide & Carbon Corp. |
**HASTELLOY** James Stellite Co. Unit of Union Carbide & Carbon Corp. |
### 1947-1948 ELECTRONICS BUYERS' GUIDE

#### MANUFACTURERS INDEX

A listing of the companies engaged in the manufacture of all types of electronic components and complete electronic equipment. They are alphabetically arranged for convenient use and quick reference.

**A**
- A.C. Products, Inc., 3374 N. New Jersey St., Indianapolis 4, Ind.
- A.C.R. Products, 7713 Lake St., River Forest, Ill.
- Abbott Instrument, Inc., 8 W. 18th St., New York 1, N.Y.

**Accurate Insulation Wire Corp., 55 Fox St., New Haven 1, Conn.**

**Accurate Spring Mfg. Co., 3811 W. Lake St., Chicago 17, Ill.**

**Ace Mfg. Corp., 1255 E. Erie Ave., Philadelphia, Pa.**

**Achilles Metal Mills Corp., Fort Houn, Mich.**

**Ackerman-Keeler Corp., 625 W. Jackson Blvd., Chicago 6, Ill.**

**Ackerstamping Co., 1923 Nebraska Ave., Detroit 26, Mich.**

**Acheson Colloids Corp., Port Huron, Mich.**

**Ace Mfg. Corp., 1255 E. Superior St., Chicago 11, N.Y.**

**Acme Fire Alarm Co., 1001 W. Fullerton Ave., Chicago 22, Ill.**

**All Weather Springs, 140 Cedar St., New York 13, N.Y.**

**Allen Mfg. Co., Hartford, Conn.**

**Allied Chalmers Mfg. Co., Chicago 5, III.**

**Allied Control Co., Inc., 2 East End Ave., New York 21, N.Y.**

**Allied Control Valve Co., Inc., 85 Spring St., New York 13, N.Y.**

**Allied Recording Products Co., 21-99 43rd St., Long Island City 1, N.Y.**

**Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.**

**Allis Co. Louis, 497 E. Stewart Ave., Milwaukie 7, Wis.**

**Allen Metal Products Co., 86 Grand St., New York 13, N.Y.**

**Alloy Metal Wire Co., Prospect Park (Morre Sta.), N.J.**

**Alma Corp., 18 E. 52nd St., New York 22, N.Y.**

**Alpha Metals, Inc., 363 Hudson Ave., Brooklyn 1, N.Y.**

**Alpha Wire Corp., 56 Howard St., New York 13, N.Y.**

**Allen Lansiine Corp., 1161 N. Vine St., Hollywood 6, Calif.**

**Aluminum Company of America, Gulf Bldg., Pitts- burgh, Pa.**

**American Brass Co., American Metal Hose Co., American Bridge Co., Frick Bldg., Pitts- burgh, Pa.**

**American Coll & Engineeering Co., 1271 N. Hermilage Ave., Chicago 22, Ill.**

**American Commercial Corp., 356 Broad- way, New York 7, N.Y.**

**American Draper Co., 410 Ravenswood Ave., Chicago 40, III.**

**American Cyanamid Co., Plastics Div., 48 Rockefeller Plaza, New York 20, N.Y.**

**American Diathermy Productions, 10860 San Vicente Blvd., Los Angeles 25, Calif.**

**American Electronics Corp., 10 E. 43rd St., New York 17, N.Y.**


**American Electric Mfg. Co., 250 Yonkers Ave., Yonkers, N.Y.**

**American Electric Co., 37 E. 15th St., New York 2, N.Y.**

**American Emblem Co., Ulica, N.Y.**

**American Electric Co., Inc., 2091 W. Congress St., Chicago 7, Ill.**

**American Express Co., 363 E. 75th St., Chicago 5, III.**

**American Hardware Co., 1101 N. Honore St., Chicago 22, Ill.**

**American Metal Supply Co., 3197 Pine St., St. Louis 3, Missouri**

**American Optical Co., Scientific Instrument Div., Buffalo 11, N.Y.**

**American Phenol Co., 1130 S. 45th Ave., Chicago 50, Ill.**

**American Plastic Equipment Co., 2450 N. Clark St., Chicago, Ill.**

**American Tool Products Co., 2907 South Main St., Los Angeles 7, Calif.**

**American Platinum Works, N.J.R.R. Ave. Denver 6, Ohio**

**American Products Mfg. Co., 4847 W. 35th St., Chicago 22, Ill.**

**American Radio Co., 611 E. Garfield Ave., Madison, Calif.**

**American Resinous Chemical Co., 104 Foster Ave., Peabody, Mass.**

**American Screw Co., 1501 W. Congress St., Chicago 7, Ill.**

**American Electro Products Co., Providence, R.I.**

**American Smelting and Refining Co., Fed- erated Metal Div., 120 Broadway, New York 5, N.Y.**

**American Soldier & Slug Co., 2152 E. Norris St., Philadelphia 36, Pa.**

**American Steel & Wire Co., U. S. Steel Corp., Subsidiary, Rockefeller Bldg., Cleveland 13, Ohio.**

**American Television & Radio Co., 300 E. 4th St., St. Paul 1, Minn.**

**American Thermionics Electric Co., 67 E. 8th St., New York 3, N.Y.**

**American Time Products, Inc., 580 Fifth Ave., New York 21, N.Y.**

**American Transformer Co., 178 Emmet St., Newark, N.J.**

**Amerline, 1755 N. Honore St., Chicago 13, Ill.**

**American Metal, Inc., Chestnut Ave., Hillsb. ide, & Argyle Corp., 4243 Lincoln Ave., Chicago 18, Ill.**

**Amerex Electronic Corp., 25 Washington St., Brooklyn 1, N.Y.**

**American Co., 361 Broadway, New York 13, N.Y.**

**Amplex Div., Chrysler Corp., Detroit 31, Mich.**

**Amplifier Corp. of America, 396 Broadway, New York 7, N.Y.**

**Amor, Aces & King Inc., 11 W. 42nd St., New York 36, N.Y.**

**Amerchord & Wire Co., 56 Broadway, New York 8, N.Y.**

**American Optical Co., Scientific Instrument Div. 1055 Main St., Pawtucket, R.I.**

**Anchor Chemical Co., 315-51 Canal St., New York 13, N.Y.**

**Anchor Electric Co., 1005 Main St., Paw- tucket, R.I.**

**Anco Products Corp., 797 Market St., San Francisco, Calif.**

**Andres Radio Corp., 43-20 34th Street, Long Island City, N.Y.**

**Andrew Co., 263 E. 75th St., Chicago 19, Ill.**

**Annis Co., R. B., 1101 N. Delaware St., Indianapolis, Ind.**

**Anselfy Radio Co., 81 St. Johns Ave., Tren- ton 9, N.J.**

**Ansonia Clock Co., 25 Lafayette St., New York 13, N.Y.**

**Ansonia Electric Co., Ansonia, Conn.**

**Applied Physics Corp., 30 South Oak St., Pittsburgh 15, Wis.**

**Applied Rechargeable Batteries, 3107 Pine St., Philadelphia 29, Pa.**

**Arays Mfg. and Supply Co., 3197 Pine St., St. Louis 3, Missouri**

**Aro Specialties Co., 2345 Lake St., Chicago 11, Ill.**

**Arlington Lighting Co., Inc., 316 Water St., Watertown 72, Mass.**

**Arlington Lighting Co., Inc., Providence, R.I.**

**Armstrong Cork Co., Lancaster, Pa.**

**Armstrong Electric Co., 1632-8 E. Baltimore Ave., Detroit 2, Mich.**

**Armstrong Molding Products, 653 11th Ave., New York 13, N.Y.**

**Arrowsmith & Holden Electric Co., 103 Willow St., East Greenbush, N.Y.**

**Arrow-Hart & Hegeman Electric Co., 106 Seventh Ave., St. Paul 1, Minn.**

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June, 1947 — MID-MONTH — ELECTRONICS BUYERS' GUIDE
RCA QUICK-REFERENCE CHART
MINIATURE TUBES

A Miniatures make practical, compact, lightweight designs. Often, they provide superior performance at less cost.

<table>
<thead>
<tr>
<th>Type No.</th>
<th>Class</th>
<th>Performance Equivalent</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2</td>
<td>Voltage Regulator</td>
<td>OD2/VR150</td>
<td>Cold-Cathode Glow-Discharge Tube</td>
</tr>
<tr>
<td>A3</td>
<td>H-F Diode</td>
<td>—</td>
<td>Heterodyne type. Discriminator for battery-operated FM receivers; portable h-f measuring equipment. Resonant frequency about 1000 Mc.</td>
</tr>
<tr>
<td>L4</td>
<td>R-F Amplifier</td>
<td>IU4</td>
<td>Filamentary type. Sharp cutoff characteristic. For battery-operated portables.</td>
</tr>
<tr>
<td>L5</td>
<td>Pentagrid Converter</td>
<td>—</td>
<td>Filamentary type. Mixer tube and oscillator in superheterodyne circuits. For portable receivers.</td>
</tr>
<tr>
<td>L5</td>
<td>Power Amplifier</td>
<td>354</td>
<td>Filamentary type. For battery receivers.</td>
</tr>
<tr>
<td>L6</td>
<td>Diode-Pentode</td>
<td>—</td>
<td>Filamentary type. High voltage gain. For broadcast receivers.</td>
</tr>
<tr>
<td>L7</td>
<td>Super-Control</td>
<td>—</td>
<td>R-F rf amplifier in battery-operated receivers.</td>
</tr>
<tr>
<td>L8</td>
<td>R-F Amplifier</td>
<td>INS-GT</td>
<td>Sharp cutoff characteristic. For low-drain battery-operated receivers.</td>
</tr>
<tr>
<td>3021</td>
<td>Thyatron Tube</td>
<td>2050</td>
<td>Relay tube and grid-controlled rectifier. Will operate directly from high-vacuum phototube.</td>
</tr>
<tr>
<td>3A4</td>
<td>Power Amplifier</td>
<td>3Q5-GT</td>
<td>Filamentary type. A-F output of 700 millivols., or r-f output of 1.2 watts at 15 Mc.</td>
</tr>
<tr>
<td>3A5</td>
<td>H-F Twin Triode</td>
<td>154</td>
<td>Filamentary type. For use in h-f applications. Class C output about 2 watts at 40 Mc.</td>
</tr>
<tr>
<td>304</td>
<td>Power Amplifier</td>
<td>3Q4</td>
<td>Filamentary type. Similar to 3A4, but has preferable biasing arrangement. For 3-way battery portable receivers.</td>
</tr>
<tr>
<td>305</td>
<td>Power Amplifier</td>
<td>6GA5</td>
<td>Sharp cutoff characteristic. High transconductance and low input and output capacitance. l-f video amplifier or r-f amplifier up to 400 Mc.</td>
</tr>
<tr>
<td>6A5</td>
<td>R-F Amplifier</td>
<td>—</td>
<td>Sharp cutoff characteristic. High transconductance, low input and output capacitance, and high gridplate capacitance at higher frequencies. l-f video amplifier or r-f amplifier up to 400 Mc.</td>
</tr>
<tr>
<td>6A5</td>
<td>H-F Twin Triode</td>
<td>5V6</td>
<td>High plate current. For use in RF amplifiers.</td>
</tr>
<tr>
<td>6A6</td>
<td>Beam Power Amplifier</td>
<td>657</td>
<td>Combined detector, a-f amplifier, and r-f amplifier, and r-f amplifier or r-f amplifier up to 400 Mc.</td>
</tr>
<tr>
<td>6A6</td>
<td>Duplex-Diode</td>
<td>—</td>
<td>Combined detector, amplifier, and r-f amplifier, and a-c amplifier.</td>
</tr>
<tr>
<td>6A6</td>
<td>High-Mu Triode</td>
<td>6587</td>
<td>Combined detector, a-f amplifier, and a-c amplifier.</td>
</tr>
<tr>
<td>6A6</td>
<td>R-F Amplifier</td>
<td>—</td>
<td>Combined detector, amplifier, and a-c amplifier.</td>
</tr>
<tr>
<td>6A6</td>
<td>R-F Amplifier</td>
<td>65G7</td>
<td>Sharp cutoff characteristic. High transconductance and low gridplate capacitance. For r-f and a-c stages of FM and AM receivers.</td>
</tr>
<tr>
<td>68A6</td>
<td>R-F Amplifier</td>
<td>65G7</td>
<td>Remote cutoff characteristic. High transconductance and low gridplate capacitance. For r-f and a-c stages of FM and AM receivers.</td>
</tr>
<tr>
<td>68F6</td>
<td>Pentagrid Converter</td>
<td>65A7</td>
<td>Mixer tube and oscillator in superheterodyne circuits. For FM and AM receivers.</td>
</tr>
</tbody>
</table>

For use as a combined detector, amplifier, and a-c tube. For a-c amplifier or detector in U-H-F service. 

THE FOUNTAINHEAD OF MODERN TUBE DEVELOPMENT IS RCA
RCA TUBE APPLICATION ENGINEERING SERVICE —
Twelve field engineering specialists devote their time exclusively to the design problems of equipment manufacturers. They're ready to pitch in and help you at any time.

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RCA maintains tube application laboratories at Harrison, Lancaster, and Chicago. The services of these laboratories are at the disposal of all RCA tube customers.

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RCA carries on independent research in circuit design for the exclusive benefit of its customers. Engineering reports are provided as a free service.

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RCA works years ahead in tube design—anticipates future requirements. That's why you get the types of tubes you want when you want them.

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Mass-production techniques and the RCA "Preferred-Type Tube Plan" have consistently operated to reduce manufacturing costs—which means lower prices to you.

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The vast resources of experience and ability that account for RCA's engineering leadership, are of direct benefit to RCA customers—a final reason why it pays to deal with RCA.