

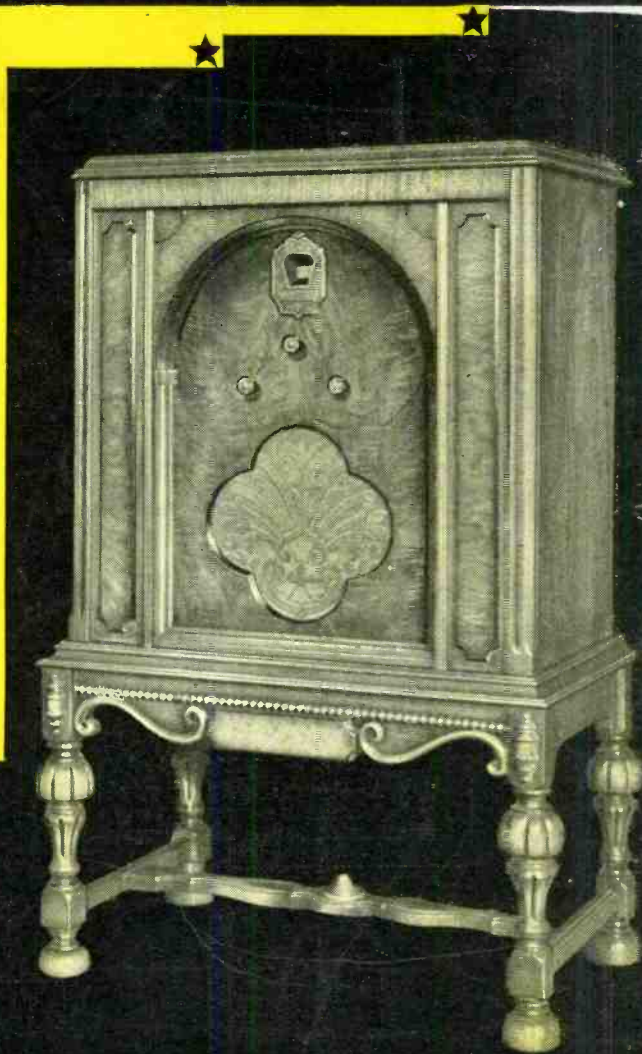
RADIO



**JUNE
1930**

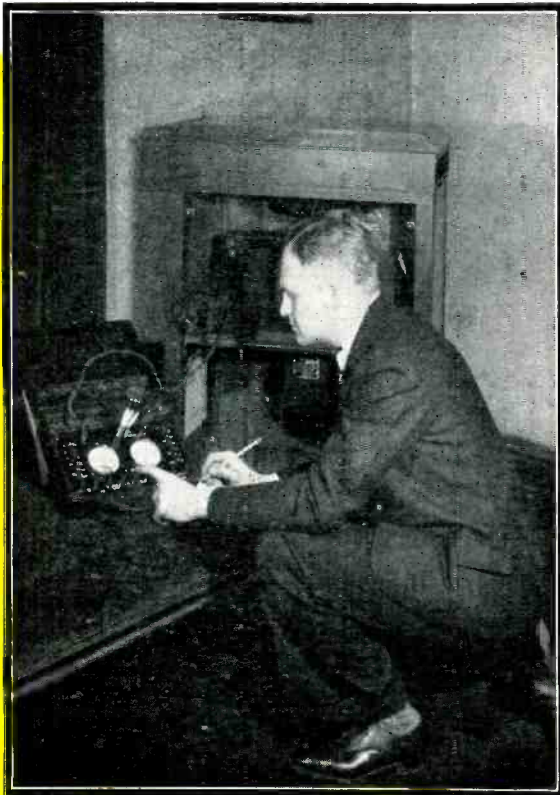
**Who's to be
1930's
radio star?**

SEE PAGES
39-40-41-42



Clarion

THE GREATEST RADIO VALUE AT ANY PRICE



"25% More Calls Daily" " " " With a JEWELL Pattern 199"

reports a successful radio service manager in one of Chicago's largest suburbs after using 199's for several months.

Time means money in radio service work and the service man who uses poor testing equipment is tremendously handicapped. The organization equipped with Jewell Pattern 199's is able to service economically and well.

By providing accurate and rapid means of locating radio set troubles Jewell Pattern 199 Set Analyzers quickly pay for themselves. When used with Jewell analysis charts and service data they leave nothing to guesswork. Therefore, they not only save time for service men, but the inherent accuracy of a service analysis by the Jewell method instills confidence in customers, causing them to believe alike in their receiver, the dealer, and his organization.

The Jewell Pattern 199 is but one of the many highly efficient special instruments developed by Jewell to meet the exacting demands of radio service men.

A new bulletin just off the press describes the complete line of Jewell radio service instruments — instruments that mean lower service costs and bigger profits to radio dealers, and bigger incomes to radio service men. Write for your copy of this important bulletin today.



Pattern 199

Set Analyzers quickly pay for themselves in saving of time and elimination of customer complaints.

30 YEARS MAKING GOOD INSTRUMENTS
JEWELL

Jewell Electrical Instrument Co.
1642-I Walnut St., Chicago, Ill.

I certainly want to know about all the latest Jewell radio service instruments. Send me your new radio bulletin.

Name

Address



MODEL 36 CONSOLE
(illustrated)
\$208 without tubes.

*Other Models \$248 and
\$287 without tubes.*

**BOOTHS B27-28,
R. M. A. TRADE SHOW,
ATLANTIC CITY
Suite 18 to 22—
Eleventh Floor,
The Ritz-Carlton—
Atlantic City**

Radio by Story & Clark

The House of Story & Clark, realizing how much was expected of it, has been in no haste to enter the field of radio. It knew that whatever it produced must be true to the traditions it has kept alive for nearly three-quarters of a century in the making of fine musical instruments.

The year 1930 brings to a close

radio's decade of formative confusion and marks the birth of this fine musical instrument from the House of Story & Clark.

It is simple, efficient, beautiful — the radio you expect of Story & Clark — a firm whose two enthusiasms are its splendid old name and the craftsman-ideal for which that name has always stood.

STORY & CLARK RADIO

(Built complete in the Story & Clark factories)

THE STORY & CLARK RADIO CORPORATION
173 North Michigan Avenue · Chicago

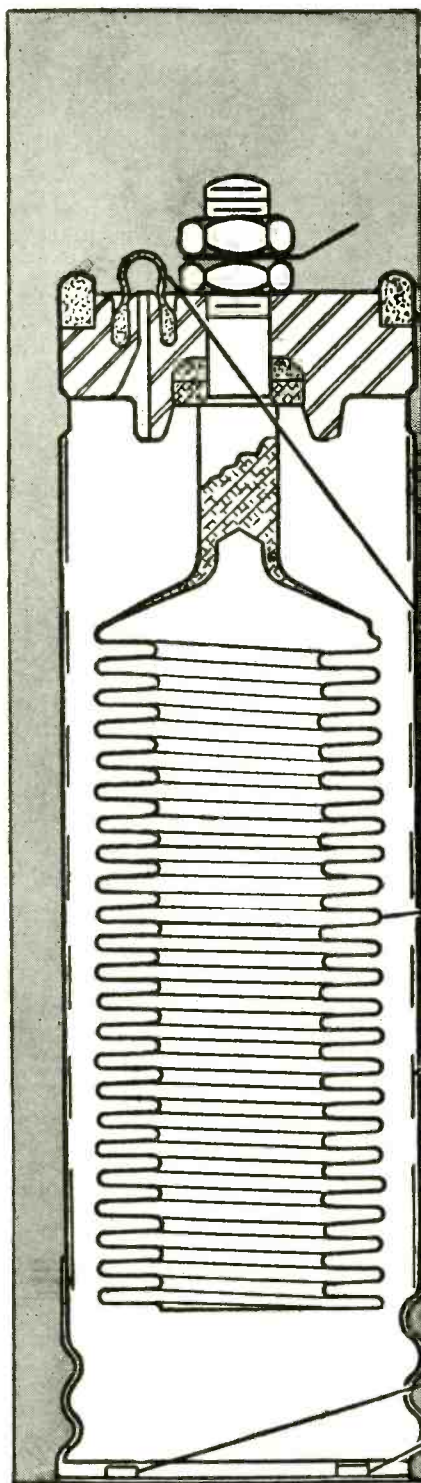
*Division of the House of Story & Clark, makers
of fine musical instruments since 1857*

*Manufactured under Story & Clark owned Patents & Patents Pending.
Licensed under R. C. A. and Affiliated Companies. Charter member R. M. A.*

SPRAGUE

ELECTROLYTIC CONDENSER

The NEW Way
To Make Money
In RADIO



Pressure seal gasket.

Protected vent, vulcanized in hard rubber top.

One piece anode of pure aluminum, no welded or riveted joints.

Shield preventing internal short circuit.

Individual container for space with maximum flexibility.

Screw type socket-mounting.

Locking lugs in socket prevent condenser shaking loose during shipment.

With a powerful, perfected, compact unit of 1 3/8" diameter and 5" height—you have 8 MFD capacity with a peak voltage of 430 DC. An individual screw-type socket-mounting makes installation a matter of seconds. And the SPRAGUE one piece anode represents the greatest mechanical and electrical improvement in the manufacture of electrolytic condensers.

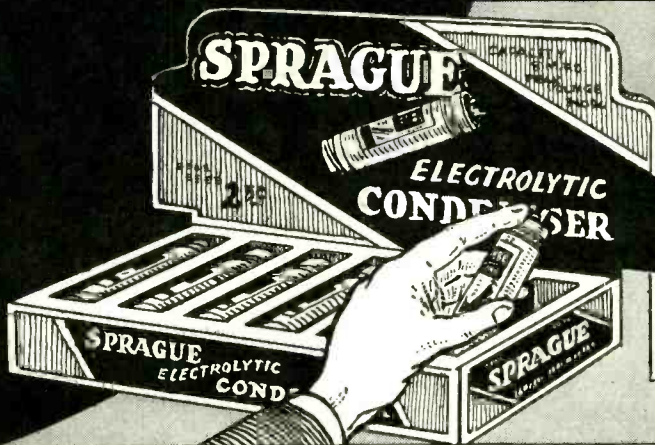
Packed six units in a handy, colorful selling display—priced popularly at \$2.50 per unit—the SPRAGUE Electrolytic Condenser is one of the most profitable items you can stock for sale to service men, radio amateurs and fans who build their own sets.

SPRAGUE SPECIALTIES COMPANY
Quincy (Boston) Mass.

Manufacturers also of the well known Sprague Paper Condensers.



This striking 3-color card sells SPRAGUE Electrolytic Condensers "on sight."



Here's \$15 worth of clean, swift-selling merchandise that will solve your customers' condenser problems, and pay you a sweet profit.

THE SHOW NUMBER

THIS June issue of RADIO is designed primarily for the information of those radio dealers who are unable to attend the RMA show at Atlantic City. In it will be found illustrations and descriptions of many of the new models which are there exhibited. Other models, concerning which advance information is not available, will be pictured and described in the July issue. These two numbers will enable any dealer to determine what lines he wants to sell during the season to come.

This issue also marks a complete divorcement of reading material that is deemed to be of interest to the man who sells radios from that which is thought interesting to the man who services radios. The latter material is published in a supplement which is being sent to those subscribers who have ordered "Data Sheets," whose place is to be taken by the supplement.

If sufficient approval is given to this plan after a trial period it will be adopted as a new policy for the magazine. The regular issue will contain articles and news intended to help the radio dealer and the supplement will contain suggestions for the men who actually install, test and repair sets. As service men are also interested in selling, they will receive both services.

So many favorable comments have been aroused by Volney G. Mathison's "Confessions," that he has consented to write other articles that will treat of the radio dealers' problems from the human interest standpoint. In this issue also is the first of another series of articles by John T. Bartlett, who deals with various phases of the credit situation.

RADIO

Established 1917

Reg. U. S. Pat. Office

PUBLISHED ON THE FIRST OF EACH MONTH
AT 428-430 PACIFIC BLDG., SAN FRANCISCO, CALIF.

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A Suggestion to the Reader:

After reading this June number of RADIO give it to some one else in the trade who might be interested in it. Even if he is your competitor, remember that the safest competitor is an educated one. RADIO is teaching better sales and service methods. But if you want to keep this number yourself, send the name of the man whom you think it would help and the publishers will send him a free sample copy.

The Unbeatable *BEATEN!*

Wright-DeCoster
Reproducers

Exceed Their Own Performances!

New 1931 Models the
Greatest of All Time



*New 1931
Wright-DeCoster
Speaker of the Year*

See the Wright-DeCoster at the Atlantic City Show



Exhibited at Booth B9, R. M. A. Trade Show, and demonstrated at Wright-DeCoster Demonstration Rooms, Ambassador Hotel, Atlantic City, where we will be delighted to meet you personally.

WRIGHT-DECOSTER INC., University Ave., St. Paul, Minn.

Export Department: M. SIMONS & SON CO., 220 Broadway, New York City

Cable Address: "SIMONTRICE," New York

RADIO FOR JUNE, 1930

SPREADING LIKE WILDFIRE!

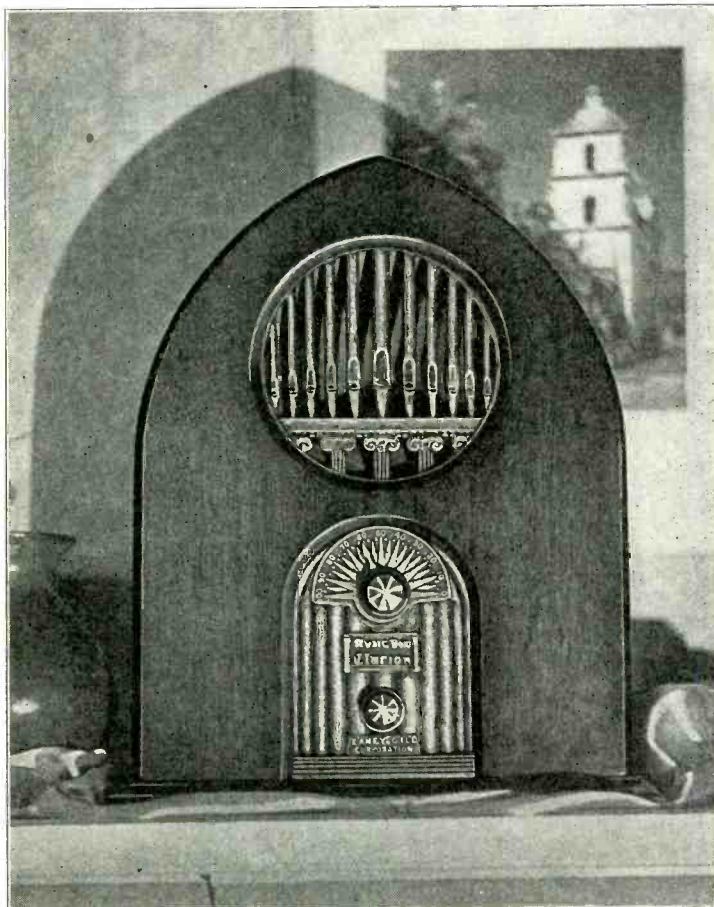
Wires

Phones

Telegrams

Pouring from
all parts of the
world. Every
sale brings
hundreds of
others.

*The Greatest
Drawing Card
of 1930.*



First, in the
West—

Then in the
Middlewest—

Now in the East.

An avalanche of
sales wherever
introduced.

*Never has
anything in
Radio met
with such a
reception.*

THE MIGHTY MIDGET OF RADIO

THE MUSIC BOX "CLARION"

HERE ARE THE FEATURES

CIRCUIT—A product of the laboratories of the Zaney-Gill Corporation—a new revolutionary circuit, a sensation in simplicity and efficiency—eliminating 40% of perishable parts, and delivering the output of the ordinary 8-tube set. Here you find Screen-Grid at its greatest advantage—coupled with an exclusive 245 amplification output that delivers unbelievable volume. The other tubes are 227's and a 280 full-wave rectifier.

CHASSIS—Of die cast Duralium; thoroughly shielded—easily accessible—extremely sturdy—assembled by skilled radio technicians; built for hard usage. All parts are oversized, insuring long life.

SPEAKER—Specially designed and matched to this circuit—Tone Quality never before attained except in Super Dynamics. Sturdy, to carry the tremendous 245 output.

TUBES—Only leading brands of licensed tubes used with full replacement service.

THINK! Over 75% sold for cash in the West. Over 35% are sold to present Radio Owners. Sell Radios Cash and Carry over the counters. If you don't grab this deal now, your neighborhood dealer will and pick off your prospects. Sell the Public what they want.

THE CABINET—Of solid mahogany with an inch front panel—perfect baffling—exquisite tone. Size 14"x18"x8". Extremely sturdy, yet a very beautiful addition to any room. Grill and escutcheon of bronze finish, with a full vision dial reading.

DISTANCE—Limited only to the suitability of your location. With a good aerial and ground remarkable distance may be enjoyed. In outlying sections we recommend an aerial of 100 feet or more.

SELECTIVITY—Of unbelievable sharpness from a multi-gang condenser—cutting and separating the strongest stations. Enjoy your favorite program without interference.

ACCESSIBILITY—Chassis may be removed and replaced in five minutes. All parts are accessible to outside adjustment.

RETAILING AT

\$ 59⁵⁰

Complete
with
Tubes

and inductor type

SPEAKER

MANY TERRITORIES STILL AVAILABLE—WRITE OR WIRE FOR DETAILS

ZANEY-GILL CORPORATION

PHONE PLEASANT 3147 ✓ 5914-20 SO. WESTERN AVENUE ✓ LOS ANGELES, CALIFORNIA

IN RADIO SINCE 1915

Tell them you saw it in RADIO

MERSHON

ELECTROLYTIC CONDENSER



Single anode,
inverted type

Self-Healing

The Pioneer

First patented in 1911. First publicly displayed for use in radio receivers in 1921—and in continuous development and production since then—the Mershon Condenser is unquestionably the pioneer, practical, successful electrolytic condenser. And by virtue of the vast experience and research behind it, it is today years ahead of any other condenser in the field. It was first to provide high capacity in small space, to afford absolute freedom from puncture and to embody a service life measured in years, rather than weeks or months.

Multiple anode,
upright type



Dealers and Service Managers

will find in the Mershon Condenser a new source of profitable business. They provide economical replacements in damaged power-packs, and trouble-free operation in custom-made receivers and transmitters. Mershon Condensers can be had in self-contained units of 8 to 72 MFD capacity—saving at least half the space and one-quarter the cost of equivalent paper capacity. They can be kept for an indefinite period without deterioration—and because of their self-healing features they make instant appeal to amateurs, repair men and service men.

The new booklet "Puncture-Proof Filter Condensers" describes the Mershon Condenser, and shows its profit-making possibilities for you.

THE
AMRAD CORPORATION
265 College Avenue
MEDFORD HILLSIDE MASS.

"We'll See You At
Atlantic City"
Auditorium Booth C-1
June 2nd to 6th

NOW.

THE NEW IMPROVED

TRIAD LINE



See the TRIAD display at the
R. M. A. Show Booth A 46
Hotel Headquarters
Marlborough-Bienheim



TRIADS have always been known as "better" tubes. Nevertheless our engineers have been ceaselessly experimenting — searching — testing to find the BEST.

And now — this skilled research has developed for TRIAD T-24 a more rigid construction that practically eliminates microphonics and burn-outs. The same painstaking effort has discovered a new carbonizing process that renders TRIAD T-45 free from gas — has evolved Improvements that give to this tube longer life — greatly increased range and undistorted output — ability to stand materially higher plate voltages — and super-clear and amazingly realistic tonal quality

These advantages mean — greater satisfaction for your customers — bigger sales and greater profits for YOU!

Triad Manufacturing Co., Inc. Pawtucket, R. I.

TRIADS are now manufactured under R.C.A., G.E. and Westinghouse patents — thus assuring you the best in Radio research and engineering skill.

TRIAD RADIO TUBES



Three Wright-DeCoster Horns Mounted on Front of Arena at St. Louis International Aircraft Exposition

Wright-DeCoster Horns Project Sound 2 Miles

This outstanding achievement marks an epoch in the history of sound reproduction and projection. Read the letter below! It tells a most interesting story.

AERONAUTICAL CHAMBER OF COMMERCE OF AMERICA, INC.

10 E. 40th Street, New York

March 21, 1930.

Wright-De Coster, Inc.,
Saint Paul, Minnesota.

Gentlemen:

We wish to take this opportunity to express to your organization our complete satisfaction with Wright-DeCoster loud speaker equipment used at the Forest Park Airport in Saint Louis during the International Air Craft Exposition, just concluded.

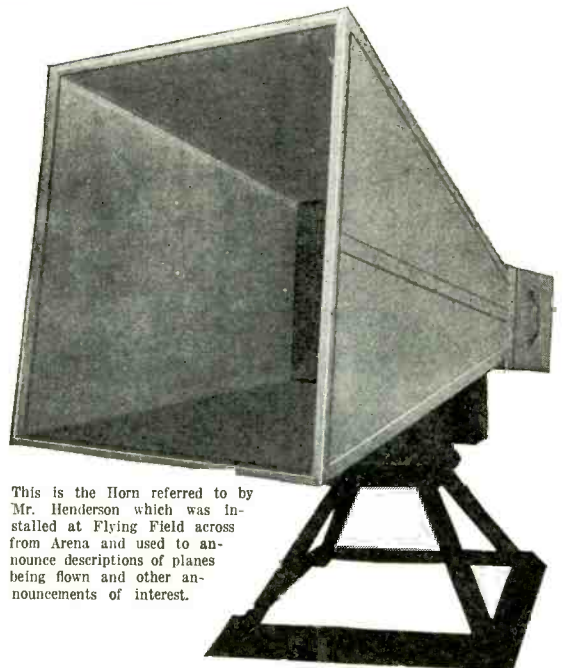
The large horn used on the airport adjoining the Arena building gave ample volume, good tone and thoroughly fulfilled our requirements for an Airport public address system. We feel that loud speaking equipment is necessary to conduct a well established port and before closing headquarters we wish you to know that Wright-DeCoster equipment has our unqualified endorsement.

Yours very truly,

By: (signed) Cliff Henderson, Mgr.,

FKC:CT

INTERNATIONAL AIR CRAFT EXPOSITION.



This is the Horn referred to by Mr. Henderson which was installed at Flying Field across from Arena and used to announce descriptions of planes being flown and other announcements of interest.

Have You Ever Thought of Selling Sound Equipment?

The biggest possible future in the field of radio is sound installation. The sound engineer has wonderful possibilities. Install sound equipment in theatres, churches, schools, public halls, rinks, playgrounds, sports arenas,

bathing beaches, airports, amusement parks, municipal parks and every place—indoors or out—where people congregate. Even cemeteries are using sound equipment to broadcast organ music.

WRITE FOR FULL DETAILS AND ADDRESS OF NEAREST SALES OFFICE

WRIGHT-DECOSTER, Inc., 2217 University Ave., St. Paul, Minn
Export Dept.: M. SIMONS & SON CO., 220 Broadway, New York
Cable Address: "SIMONTRICE," New York

*Marking a New Era in the Radio
Industry... an Era of Dependability
and Permanent Service*



RADIO

RMA SHOW ATLANTIC CITY JUNE 2-6 1930



A Message to Radio Dealers

Since the infancy of radio, General Electric has been a leading contributor to the scientific progress which has made your business the greatest in the field of electrical merchandising.

In our research laboratories, scientists have labored year in and year out, discovering and perfecting principles and devices, many of which are so fundamental that we now accept them as matters of course.

Millions of dollars have been spent in this research.

We are now about to extend our activity in the commercial field, and will soon place before the public radio receiving sets on which we are proud to place the G-E Mono-

gram. This act is an event in the life of the Company of equal importance to any of the other milestones which have marked our progress to our present position in the electrical industry.

For thirty odd years we, and those who preceded us, have given our best efforts to make General Electric successful in that which it has undertaken.

This tradition of success is the heritage of those who have been charged with the marketing of the G-E Set. We are massing our resources to the end that General Electric Radio may enjoy the same measure of success which has marked our efforts in other lines of business.

GENERAL  ELECTRIC

MERCHANDISE DEPARTMENT • GENERAL ELECTRIC COMPANY • BRIDGEPORT, CONNECTICUT

A sound Progressive Policy assures a **PROFITABLE** and **PERMANENT** Franchise for a selected list of **DEALERS**

UNPRECEDENTED PUBLIC ACCEPTANCE

The name "General Electric" and the G-E monogram enjoy national acceptance and confidence. That confidence is General Electric's password into the homes of America. It is the foundation upon which the success of General Electric Radio will be built.

PRESERVING ESTABLISHED GOOD-WILL

Each individual General Electric Radio set, every phase of the merchandising operation, will be accepted or rejected on the basis of its ability to preserve and enhance the reputation of the name "General Electric".

Because of its confidence in General Electric the public expects the unusual from G-E Radio—from the performance of the set and from those who serve it. General Electric Radio stands pledged to that "unusual" standard.

TURNING G-E GOOD-WILL INTO SALES

Public confidence in General Electric will make millions want to see and hear the G-E Radio. General Electric definitely promises its dealers that these millions will be surprised and delighted with this new product.

RELIABLE, ESTABLISHED DISTRIBUTORS

Supporting G-E Radio dealers is an organization of alert, experienced distributors. Men who know G-E products...how to merchandise them...and are pledged to a new high standard of service. They are selecting dealers desirous of doing business on a permanently profitable basis.

COMPETENT FACTORY FIELD STAFF

In addition to the distributing houses and their field organizations, General Electric has organized a radio field force. Men whose names and reputations are respected and whose abilities and records have been proven. These experienced radio merchandisers will direct the General Electric Radio program in their territories, enabling selected dealers to make the most of the great opportunity which General Electric Radio presents.

DOMINANT ADVERTISING PROGRAM

The vast experience of General Electric in advertising products for home use is back of a nationwide advertising campaign for G-E Radio.

CAREFULLY CHOSEN DEALERS

Dealers will be selected for their ability to fulfill the merchandising responsibility which is expected of them as General Electric Radio Dealers.

If you are that kind of dealer... if the prospect of a permanent, profitable franchise that will grow steadily in value and volume from year to year appeals to you—make a point of seeing your local General Electric Merchandise Distributor at once.


IF YOU WILL BE AT THE RMA SHOW AT ATLANTIC CITY—SEE NEXT PAGE

Every G-E RADIO DEALER will have the full resources of GENERAL ELECTRIC behind him!



The Men back of
GENERAL  ELECTRIC
RADIO
wish to see **YOU**
at the **RMA Show**
ATLANTIC CITY
June 2-6 1930



 *Please*
accept this as a
PERSONAL Invitation

DAYRAD INSTRUMENTS insure greater profits in your Service Department

The visits of your service men to the homes of radio owners bring orders for new tubes, better speakers and other radio merchandise. There are many reasons why your Service Men should be equipped with DayRad Instruments for testing all makes of radio sets and tubes. We mention here the three dominant reasons why—

- (1) Because with DayRad they can make every conceivable test—
- (2) Because all DayRad Instruments are simple, accurate and up to the minute—
- (3) Because they cost less than other reliable instrument for the purpose—

Measure DayRad by the scope of service rendered, compare them in every detail with other types at higher price; the weight of evidence is all in favor of DayRad. This is true of DayRad Set Analyzers, Tube Checkers, Ohmmeters, the new DayRad Automobile Set Analyzer, the new DayRad Grid Dip Meter Unit, and the DayRad Test Panel.

ALL THESE DAYRAD INSTRUMENTS WILL BE ON VIEW AT R.M.A. TRADE SHOW, ATLANTIC CITY, JUNE 2-6

If, for any reason, you do not attend the Show, write now to Dayton, address below, for descriptive circulars.



DayRad Automobile Set Analyzer

Coltmoeter resistance 5,000 ohms per volt.
Six D.C. voltage scales—0-1-5-10-20-100-200.
Milliammeter scales—0-.4-10-20.
One selector switch.
Double ohmmeter range.
Self-contained continuity tests.
All ranges available for external use.

Dealers Net Price

\$66.00

A.C.-D.C. Radio Set Analyzer

One selector switch.
A.C. Volts—0-4-8-160-800.
D.C. Volts—0-20-100-200-600.
Resistance 1000 ohms per volt.
D.C. Mills—0-20-100.
Separate tests on 280 rectifier plates.
Self-contained continuity test.
Resistance and capacity tests.
All ranges available for external use.

Dealers Net Price

\$58.50



DayRad Grid Dip Meter

Combining Oscillator, Grid Dip Meter and Out-Put Meter

For aligning and neutralizing radio frequency circuits, either individually or overall. Visual indicators on out-put meters. No external batteries required. Operates from 110 volts. 60 cycle line. Light and portable.

Dealers Net Price

\$37.50

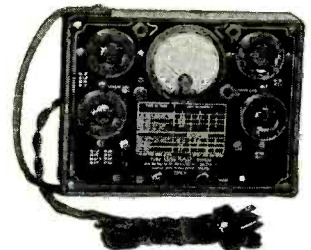
Prices on other voltages and frequencies on request.

DayRad Type B Tube Checker

Operates from 110 volt A.C. Line.
No rheostats—no adapters.
Tests all standard radio tubes as well as Kellogg, Cardon.
Wired for pentode testing.
Indications for good, fair and poor tubes engraved on panel.
Simple—Accurate—Complete.

Dealers Net Price

\$22.75



DayRad Ohmmeter

Designed especially for measurement of resistors commonly used in Radio power packs, grid suppressors, bias resistors, etc. The indicating meter is a highly sensitive galvanometer. The dial is easily readable and the resistance under test can be instantly determined.

Net Price to Dealer

\$25.00

All Instruments are Equipped with genuine D'Arsonval Movement and Meters.



DayRad's Location at Atlantic City

Visitors to the R.M.A. Trade Show will be cordially welcomed at our two locations.

Be sure to see the complete DayRad Line of Service Instruments including Tube Checkers, Counter Checker, Set Analyzers, Ohmmeters, Oscillators, Test Panels and Portable Combinations.

BOOTH No. C-29, Demonstration Room No. C. C. 4

THE RADIO PRODUCTS CO.

Fifth and Norwood

Write Department F

Dayton, Ohio



Coast Representatives:

SAN FRANCISCO
Universal Agencies
905 Mission Street
San Francisco, Calif.

LOS ANGELES
Frank A. Emmet Sales Co.
324 N. San Pedro Street
Los Angeles, Calif.

PORTLAND, ORE.
Don H. Burcham
383 Oak Street
Portland, Ore.



Tell them you saw it in RADIO

Super Akra-Ohm

Wire-Wound

RESISTORS



TYPE M



TYPE T



TYPE XM

are vital for Radio, Audio, Visio and Industrial applications of the Electronic Tube.

Super Akra-Ohm Resistors are manufactured in any value from 1.01 ohms to 10 megohms. They are carefully designed to insure an accuracy of one per cent and a constant permanency of calibration. They are especially adapted and highly recommended for Laboratory Standards, High Voltage Regulators, Telephone Equipment, Television Amplifiers, Grid and Plate Resistors, etc.

Type "T" is manufactured with soldering terminals or angle brackets. This type is designed to meet an increasing demand for a unit that can be readily mounted in precision electrical instruments, high-grade testing apparatus and high-grade radio sets.

These can be produced in quantities for a low price without sacrificing the accuracy and durability that characterize Super Akra-Ohm Resistors.

Let us know your Resistor requirements. We manufacture a type for every purpose. Samples and prices sent on request.

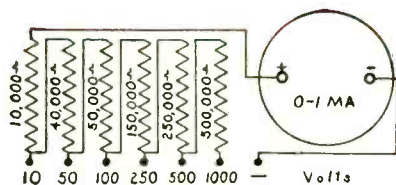


Diagram showing the use of Super Akra-Ohm Resistors in converting milliammeters to multi-range voltmeters.

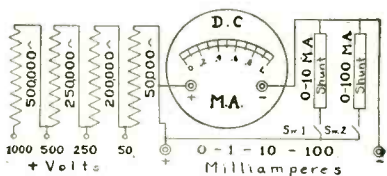


Diagram showing the use of Super Akra-Ohm Resistors and Shunts in converting from milliammeters to multi-range volt-ammeters.

ONE WATT

Resistance in Ohms	Current in M. A.	Voltage Drop	Price
1	1000	1.00	\$ 2.00
10	316	3.16	1.50
50	141	7.07	1.25
100	100.0	10.0	1.25
500	44.7	22.3	1.25
1,000	31.6	31.6	1.25
1,500	25.8	38.7	1.25
2,000	22.4	44.7	1.25
2,500	20.0	50.0	1.25
3,000	18.3	54.5	1.25
4,000	15.8	63.2	1.25
5,000	14.1	70.7	1.25
10,000	10.0	100	1.50
15,000	8.17	123	1.50
20,000	7.07	141.4	1.50
25,000	6.32	157.5	1.50
30,000	5.78	173.2	1.50
40,000	5.00	200	1.50
50,000	4.47	223	1.50
60,000	4.08	244	1.50
75,000	3.65	274	1.50
90,000	3.33	300	2.00
100,000	3.16	316	2.00
125,000	2.83	353	2.00
150,000	2.58	387	2.25
200,000	2.24	447	2.50
250,000	2.00	500	2.75
300,000	1.83	545	3.00
400,000	1.58	632	3.50
500,000	1.41	707	4.00
600,000	1.29	775	4.25
750,000	1.15	862	4.50
1,000,000	1.00	1000	5.00
1,500,000	.817	1225	7.50
2,000,000	.707	1414	10.00
2,500,000	.632	1531	12.50
3,000,000	.578	1732	15.00
4,000,000	.500	2000	20.00
5,000,000	.447	2235	25.00



I am RADIO OWL

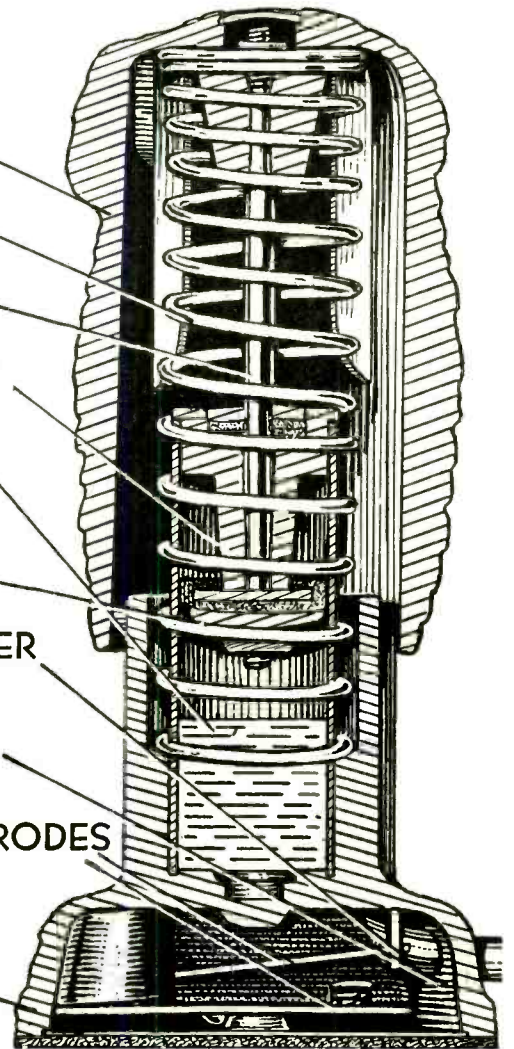
People forget to turn off their radio sets—but I never forget! I'll stand by for a half-hour—an hour—any time you say up to two hours—and then efficiently turn off the music without making a sound.

DEALERS: Stock this unique radio necessity and increase your sales volume! Radio Owl will put more dollars into your profit column than any other radio accessory you can handle. People buy it on sight—attractive counter and window display cards. Take advantage of these *extra profits!*

RADIO OWL SHUTS OFF ANY ELECTRIC HOUSEHOLD DEVICE.

Write for Folder

BODY
 SPRING
 SHAFT
 STUFFING BOX
 OIL CHAMBER
 PISTON
 SWITCH TRIGGER
 SWITCH BLOCK
 SWITCH ELECTRODES
 BASE



New
Packing Box

RADIO OWL
Manufactured by

TAYLOR-TRAVERS CORPORATION, Ltd.

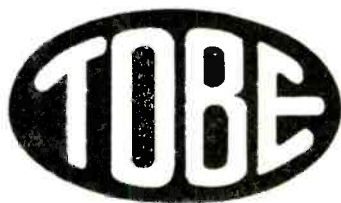
2269 East Fifty-First Street

Los Angeles, Calif.

FRAZAR & COMPANY, Ltd.

Export Agents

7 Front St., San Francisco



ANNOUNCES



Special Features of Tobe Interference Locator

1. A balanced circuit. Equal response at low and high frequencies over broadcast range.
2. Extreme sensitivity. Four A-C screen-grid and two 112A tubes. Screen-grid tubes in the tuned R-F and detector circuits, and 112A's in audio amplifier.
3. Gain is so high that electrical disturbances which may be picked up by the average electric set attached to the power lines are readily heard on the interference locator, though it is not attached to the power lines.
4. High-low frequency switches for radio or audio frequencies.
5. Vacuum tube intensity meter, indicates intensity of any type of interference.
6. Controls, switches, intensity meter and indicating meters readily accessible.
7. Antenna equipment consists of a highly efficient resonance coil, a capacitive pick-up system, an inductance loop which may be used for directional work, and an audio frequency coupling unit. These pick-up devices are used with a well insulated, collapsible extension pole.
8. Battery carrier is provided with meters to calibrate intensity control and compare intensities of interference.
9. A separate container, completely equipped with meters and control switches, holds the battery equipment for the set. Heaters and filaments of tubes are supplied from a storage battery which may be charged without removing from the battery compartment by means of the self-contained charger. A special plug is also provided so that the filament circuit may be energized directly from the storage battery of the car.
10. A-C screen-grid tubes provide extreme sensitivity, freedom from microphonics and long life under severe operating conditions of a portable locator. Construction of set is extremely rugged. It may at all times be easily adjusted and calibrated.

Price, complete except for tubes and "B" Batteries\$255.00

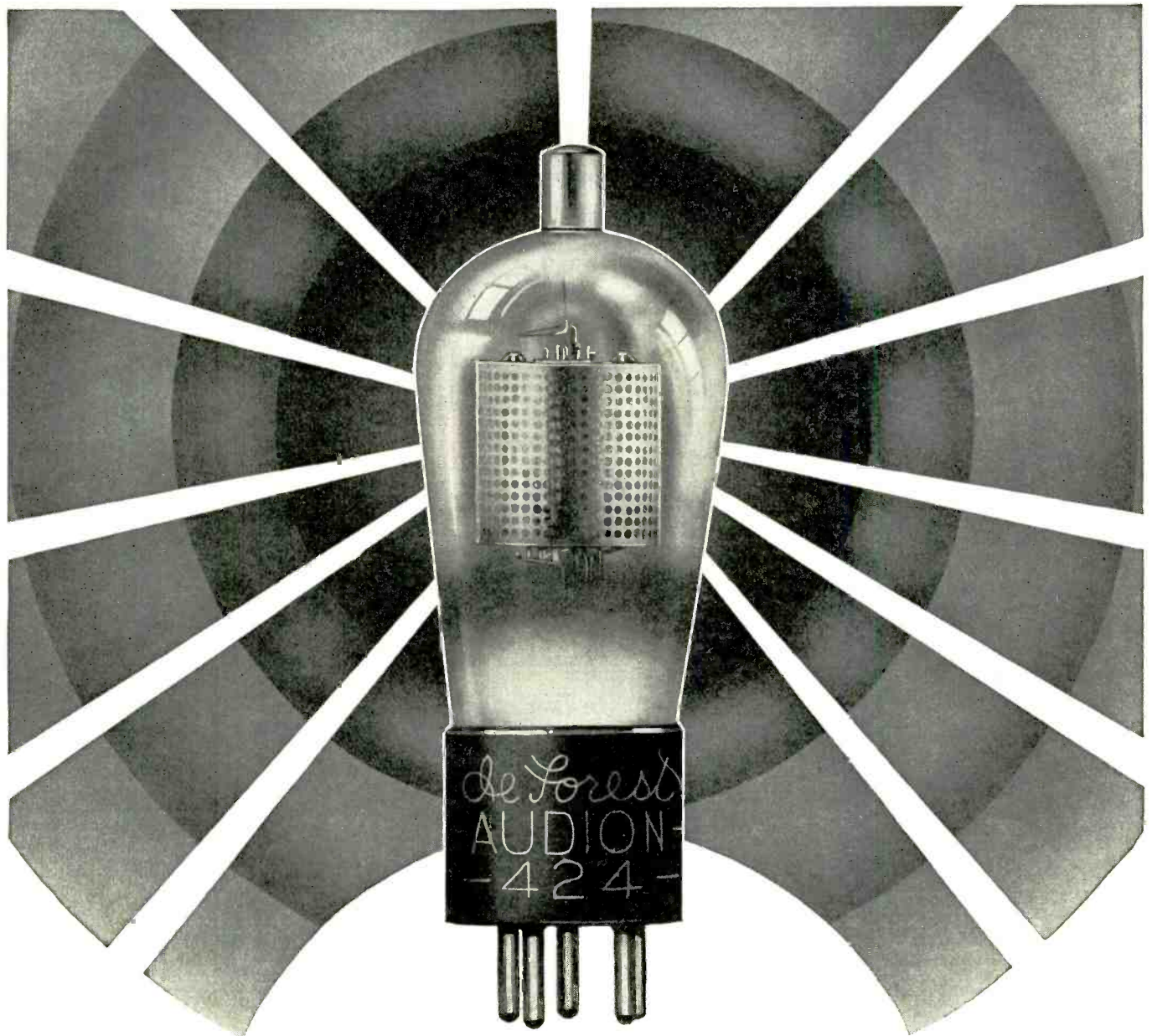
TOBE DEUTSCHMANN CORPORATION

FILTERETTE DIVISION

CANTON, MASSACHUSETTS

PIONEER AND LEADER IN ELIMINATING RADIO INTERFERENCE OF EVERY DESCRIPTION

Tell them you saw it in RADIO



De Forest Tubes have achieved a new perfection

AUTOMATIC high-speed machinery, recently developed, assures the highest engineering standards while multiplying production and reducing the selling prices.

This season get off to a new start. Push these laboratory precision tubes. You will avoid tube troubles and have fewer service calls, more satisfied customers and correspondingly larger profits.

Visit the De Forest Exhibit at Booths B3 and B4 at the 4th Annual R. M. A. Trade Show—Atlantic City Auditorium, June 2nd to 6th. Everybody of importance in radio will be there.

DE FOREST RADIO CO.
PASSAIC, NEW JERSEY

de Forest
AUDIONS
RADIO TUBES

Branch Offices located in:
Boston, New York, Philadelphia, Atlanta,
Pittsburgh, Chicago, Minneapolis, St. Louis,
Kansas City, Denver, Los Angeles, Seattle,
Detroit, Dallas, Cleveland

Tell them you saw it in RADIO

Again at

the spotlight plays
on the

SUPREME Radio Diagnostics

MODEL 400B

Makes every ^{conceivable} test on any Radio Set-

UNIVERSALLY recognized as the undisputed leader of radio testing equipment, the SUPREME DIAGNOMETER enters a new season of unusual service to RADIO DEALERS, TECHNICIANS, MANUFACTURERS and SERVICE MEN.

UNAPPROACHED! UNCHALLENGED!
UNCHANGED—except for the addition of
Pentode testing to its almost
limitless servicing functions!

SUPREME DIAGNOMETER WILL CONTINUE TO OCCUPY ITS PRESENT ENVIOUS POSITION, because,

It is designed and manufactured on a QUALITY basis . . . for permanency. New sets and circuits mean only added sources of revenue.

It gives the service man MORE for his investment, providing endless testing and servicing combinations . . . and It enables him to handle a GREATER amount of servicing in LESS time . . . at a greater PROFIT.

It creates SATISFIED CUSTOMERS and thus establishes PRESTIGE.

It offers an equal facility for EITHER PORTABLE OR LABORATORY WORK.

It will admirably handle servicing of AUTO RECEIVERS, and is designed for PENTODE testing and analysis.

"SUPREME" FEATURES

The SUPREME oscillation test gives the only, easily made, dependable test on tubes: tubes tested under radio frequency dynamic operating conditions.

Tests all types of tubes, including screen-grid and overhead heater types.

Affords a mutual conductance test of tubes.

Tests both plates of '80 type full-wave rectifier tubes.

All tubes tested independent of radio.

Locates unbalanced transformer secondaries.

Reads either positive or negative cathode bias.

Furnishes modulated signal for testing, synchronizing, neutralizing, etc.

Provides means for aligning of condensers by Thermocouple meter or A-C meter.

Neutralizing with tubes used in the set; only accurate method.

Tests gain of audio amplifiers.

Provides D-C continuity tests without batteries.

Indicate resistances, without the use of batteries, in four ranges. .1 to 25 ohms, 10 to 200 ohms, 150 to 30,000 ohms (calibration curve furnished), 5000 ohms to 5 megohms.

High resistance continuity for checking voltage dividers, insulation leakages, by-pass and filter condenser leakages, bias resistors, grid leaks, etc.

Low resistance continuity for checking rosin joints, shorted variable condensers (without disconnecting R-F Coil), center tapped filament resistors, etc.

Three precision meters; one four-scale D-C voltmeter, 0/750/250/100/10 volts, resistance 1000 ohms per volt. One four-scale A-C voltmeter 0/750/150/16/4 volts. One three-scale mil-ammeter 0/125/25 mils. 0/2 1/2 amps.

External connections to all apparatus.

Universal analyzer plug.

Screen-grid socket analysis.

Makes all analysis readings. Provides simultaneous plate current and plate voltage readings and the customary readings of A-C and D-C filament voltage, grid voltage, cathode bias, screen-grid voltage, line voltage, etc.

Measures capacity of condensers from .1 mfd. to 9. mfd.

Tests trickle charger by meter.

Bridges open stages of audio for testing.

Contains 500,000-ohm variable resistor, 30-ohm rheostat and .001 mfd., .002 mfd. and 1 mfd. condensers for testing.

The laboratory test panel is equipped with a variable condenser for controlling the frequency of the oscillator.

Pentode Testing and Analysis.

Servicing Auto Receivers.

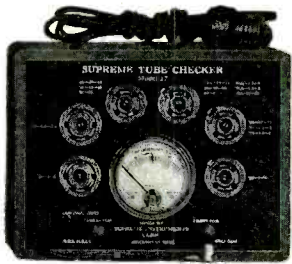
Provides many other tests, readings and functions.

"Supreme BY COMPARISON."

the RMA show

IT pays to insist on the BEST . . . especially in purchasing radio testing equipment. INVEST WISELY in a SUPREME DIAGNOMETER and clip the coupons of regular dependable PROFITS FROM YOUR RADIO SERVICING!

PICTORIAL DIAGRAMS now included in revised SUPREME INSTRUMENTS MANUAL, reducing operation to extreme simplicity. Sent free to all users upon request.



SUPREME TUBE CHECKER Model 17

Dealer's Net Price \$21.75
F.O.B. Greenwood, Miss.
Size 3 3/16 x 7 5/16 x 5 9/16
Shipping weight, 4 3/4 lbs.

The greatest value that has ever been offered in a tube checker. Equal in quality to tube checkers selling for double the price and is much more simple in operation. Tests all types of tubes including screen-grid.



Dealer's Net Price, F.O.B. Greenwood, Miss. Size 7 1/2 x 12 x 16 1/2. **\$139.50**

Also available in smaller case for radio-man who does not care to carry spare parts, tubes, etc., in same unit.

Most good distributors carry the Supreme Diagonometer in stock. If yours cannot supply you, send order direct on form below.

SUPREME

Testing Instruments

"SUPREME BY COMPARISON"

"Supreme" precision instruments include Tube Testers, Ohmmeters, Megohmmeters

Supreme Instruments Corporation
GREENWOOD, MISS.

Distributors in all principal cities

Service Depots in New York, Pittsburgh, Chicago, Kansas City, Seattle, San Francisco, Toronto

Supreme Instruments Corp.
368 Supreme Bldg.
Greenwood, Miss.

Please ship SUPREME DIAGNOMETER Model 400-B on basis checked below.

- Net cash \$139.50.
- Time payment plan — \$33.50 cash and 8 monthly payments of \$15.00 each.

All prices are F.O.B. Greenwood, Miss. No dealer's discount.

Date shipment desired

Signed

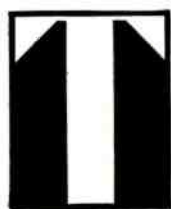
Firm Name

Street Address

City

State

Please give three or more bank or trade references and names of distributors from whom most purchases are made.



Do think of
TRANSFORMERS

is to think of
THORDARSON

TRANSFORMER SPECIALISTS
Since 1895 / / / / / /

Microphone Transformers ● Line
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Reactors ● Filter Chokes ● Audio
Transformers ● Impedance Matching
Transformers ● Power Compacts ●
Speaker Coupling Transformers ●
Complete Amplifiers

*{ Catalog of new Replacement Power and Audio
Transformers will be sent upon request }*

THORDARSON ELECTRIC MFG. CO.
Huron, Kingsbury and Larrabee Sts., Chicago, Ill., U. S. A.

ANNOUNCING AN INTRODUCTORY SALES PLAN ON **EVEREADY RAYTHEON** **4-PILLAR TUBES** OPENING THE DOOR TO BIGGER PROFITS

YOU'LL travel long and far to find another offer as attractive as this one. In the first place, it involves the finest quality merchandise—Eveready Raytheon 4-Pillar Tubes! Tubes that have built an outstanding reputation for performance in every radio set where they've been installed. In addition, this introductory sales plan is made with no strings or reservations. It's just the same as money in the bank—or in the cash drawer. Here it is:

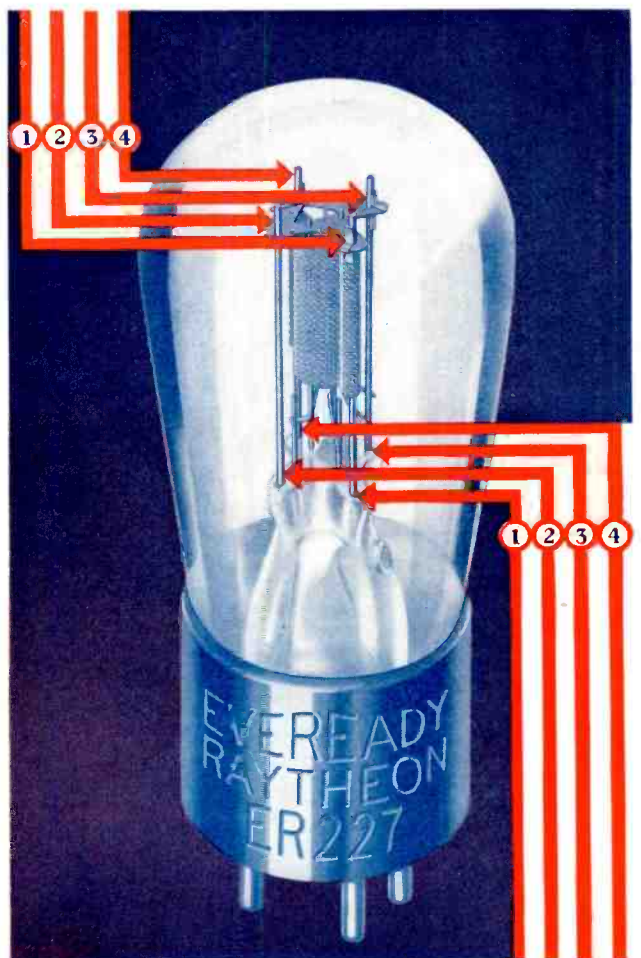
1 With every purchase of 25 Eveready Raytheon Tubes, either assorted types or one type, two additional type-227 tubes will be included in the shipment. No charge. You pay for 25, but you get 27 tubes.

2 With every purchase of 45 Eveready Raytheon Tubes, either assorted types or one type, 5 additional type-227 tubes will be included in the shipment. No charge. You pay for 45, but you get 50 tubes.

3 With every purchase of 200 Eveready Raytheon Tubes, either assorted types or one type, 25 additional type-227 tubes will be included in the shipment. No charge. You pay for 200, but you get 225 tubes.

In each case, the retailer may select his own assortment of tubes purchased.

AND THAT'S NOT ALL—TURN TO NEXT PAGE



>> FREE — HANDSOME EVEREADY CABINET GIVEN YOU WITH MADE OF METAL

THIS special K-11 50-tube deal offers you outstanding profit. You get this brilliantly colored, permanent, metal tube-vending cabinet free with your purchase of 45 Eveready Raytheon Tubes in the following types and quantities:

15 - Type-224; 10 - Type-227; 10 - Type-245; 5 - Type-280; 5 - Type-226.

You will also receive five additional type-227 tubes in the shipment, at no additional charge. You pay for only 45 tubes in the assortment given above. AND you get 50 tubes and the metal cabinet shown on this page. The cabinet is offered to dealers in this K-11 deal only. This assortment has been tested and packed at the factory and sealed in the cabinet in which you receive it.

You pay \$86.25 for this deal. You get \$156.25 from your customers. You make \$70, which is 81% on your investment!

Look at the illustrations. They show the front and back of this strong, striking cabinet—it actually helps you sell the tubes!

The assortment of Eveready Raytheons which you get, including your five free tubes, comprises the most popular types! The purpose from start to finish is to help you sell the greatest number of Eveready Raytheons, and to see that you make the most money out of it. It's 100% co-operation with the trade, and there's a lot more to it than this one big bargain!



Trade-marks



RAYTHEON TUBE-VENDING

THE K-11 50-TUBE DEAL <<

—\$5 VALUE—FREE

There's national advertising—telling the public what a SOUND improvement Eveready Raytheons are. Telling them why, and pointing out the exclusive advantages of the patented Eveready Raython 4-Pillar construction.

There's the product itself—backed by National Carbon Company, Inc., a leader in the industry, with a quality reputation and a world of experience. Makers of the famous Eveready Layerbilt "B" Batteries—

an improvement as revolutionary as Eveready Raytheon 4-Pillar Tubes. With tremendous laboratory resources constantly engaged in development that will keep these tubes at the head of the league. Each Eveready Raytheon Tube meets laboratory standards of construction and performance.

There are dealer helps—counter and window displays, a muslin wall chart and tube register to tell you and your customers what you want to know about tube types, a station-log for your customers—a wealth of material to make selling Eveready Raytheons one of the easiest and most profitable things you can do. Take advantage of it—all of it—then *demonstrate* the superiority of Eveready Raytheon reception in your customers' own radios. Tell them to put a new Eveready Raytheon in each socket of their present receivers. Let them *hear the difference and see the reason.*



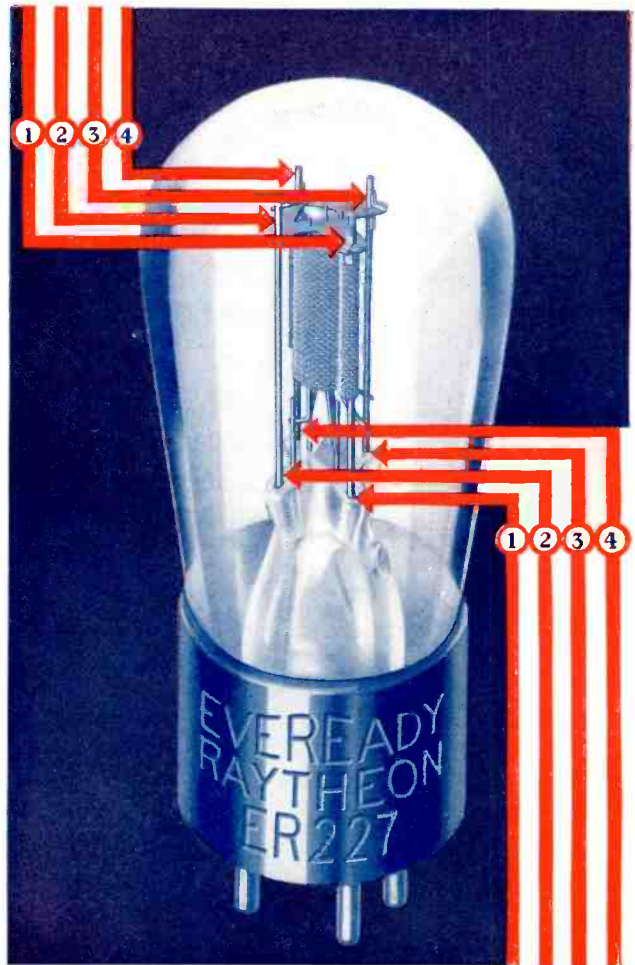
Trade-marks

>> HERE'S SOMETHING YOU CAN REALLY SELL YOUR CUSTOMERS

AS HIGH as 90% of all the radio troubles your customers have are due to faulty tubes. These customers come to you for service, and repairs . . . and *tubes*. Cut down their trouble, give them a better kind of reception than they've ever listened to from their radio sets. Sell them Eveready Raytheons! These tubes give you something to talk about.

First of all, there's the patented *4-Pillar construction*, a SOUND improvement. You can actually see it, inside an Eveready Raytheon. It means long life, strength to resist the bumps of shipment and handling which endanger the performance of ordinary tubes. And rigidity to resist vibration from dynamic speakers. Modern radios need Eveready Raytheons, with their superior strength and rigidity. These tubes are quick-acting too. For rich, full-voiced reception, with breath-taking realism, tell every customer to put a new Eveready Raytheon in each socket of his receiver.

The Eveready Hour, radio's oldest commercial feature, is broadcast every Tuesday evening at nine (New York daylight saving time) from WEAJ over a nation-wide N. B. C. network of 30 stations.



Service-men! Write for this material

Information and sales helps, designed especially for service-men's use, will gladly be sent free. Among them is a blue-print showing complete engineering data on all Eveready Raytheon Tubes. Hundreds of service-men are using this data to advantage. Write our nearest branch.



Trade-marks

NATIONAL CARBON COMPANY, INC.

General Offices: New York, N. Y.

Branches: Chicago Kansas City New York San Francisco

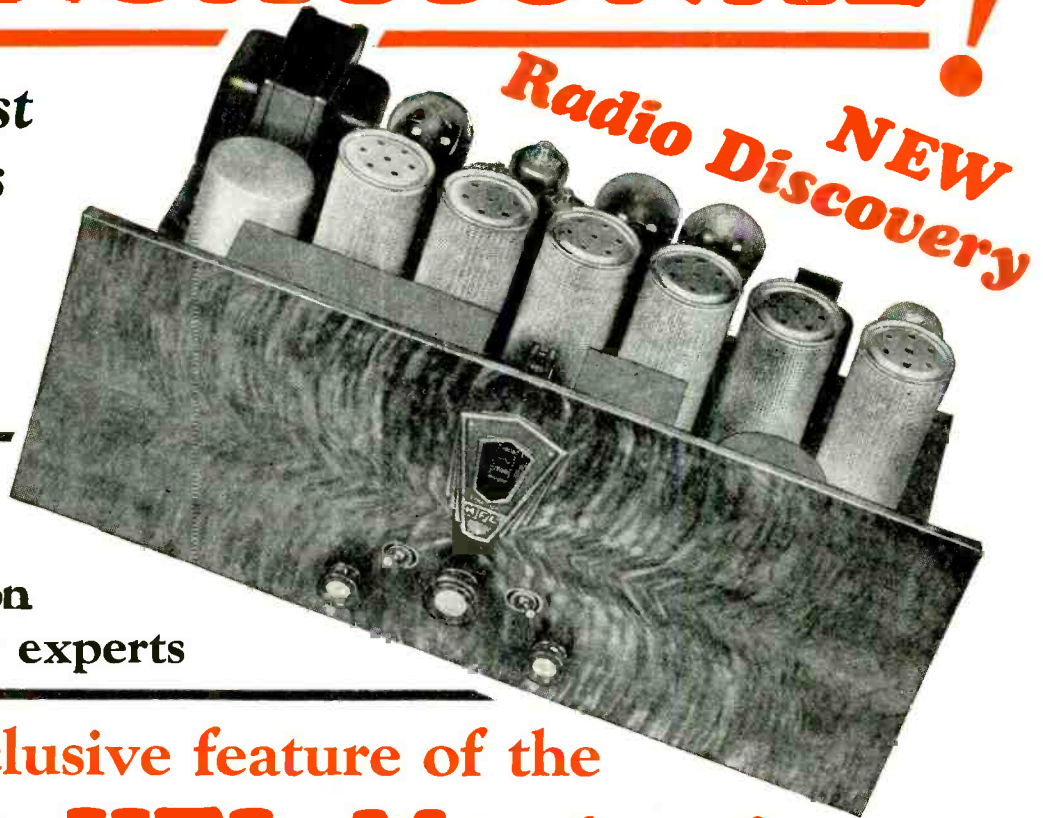
Unit of Union Carbide  and Carbon Co-poration

YOU CAN HEAR THE DIFFERENCE AND SEE THE REASON

SENSATIONAL!

- Scientist
- perfects
- long
- sought
- device

- Hopkins'
- amazing
- new invention
- approved by experts



Now an exclusive feature of the

• 1931 HFL Mastertone

At last! Radio perfection is realized. After three years of intensive research work, assisted by a corps of laboratory experts, Mr. Charles L. Hopkins, noted radio scientist, has actually developed the first practical band rejecting amplifier. This miraculous new system, long the dream of radio designers, permits the construction of a remarkably efficient receiver which is ideally perfect in operation. Stations over the entire continent may now be received with an ease of tuning, unprecedented clarity of tone and total lack of interference that astonishes engineers and fans alike.

• Interfering Stations Rejected

Application of the Hopkins principle to the 1931 HFL Mastertone has immediately resulted in three outstanding improvements. Now, for the first time in radio history, it is possible to tune in an exact 10 kilocycle channel to the complete exclusion of everything else on the air. Not 9 or 11 or 16 kilocycles, but 10—with mathematical accuracy. Stations on each side of the selected band are sharply cut off and *actually rejected*. This heretofore unattainable action now takes place over the entire tuning range. The set does not "go broad" even on the highest wave lengths.

• Tonal Perfection Realized

The salient feature of the Hopkins band rejector system is that it handles all musical frequencies with an absolutely even intensity. No sacrifice in selectivity is made in order to obtain these marvelously realistic tonal reproductions. Although the 1931 HFL Mastertone maintains a precise 10 kilocycle signal channel at all times, every note and each delicate overtone *right up to 5000 cycles* comes through with a life-like quality that is a revelation. Far distant stations have the same superb tones due to the complete elimination of all local interference.

• 12,500 Mile Reception

Engineers the country over proclaim the 1931 HFL Mastertone to be the greatest long distance receiver ever designed. Its range is easily 12,500 miles (world-wide reception) whenever weather conditions permit such distances to be covered. Five 224 screen grid, two 227, two 245 and one 280 tubes are employed. A tremendous reserve power of *over 400 per cent* is available. The Mastertone is unconditionally guaranteed to receive any station on earth that can be heard with a radio set.

• Ultra Modern

In addition to the Hopkins RF amplifying system the 1931 HFL Mastertone incorporates every modern improvement known to science. One dial, one spot, 180 K.C. intermediate amplifier. Resistance coupled, push-pull phonograph amplifier, controlled from panel. Puncture proof, high voltage, humless Electrofarad filter condensers. Self contained, all steel heavily cadmium plated chassis. Doubly shielded radio frequency circuits and dozens of other entirely new features. Our FREE literature gives complete information and prices. *Send for it today!*

DEALERS: The New Mastertone is the sensation of the century. Get in on the biggest radio boom ever known. Rush this coupon attached to your business letterhead for special proposition. **ACT QUICKLY!**

HIGH FREQUENCY LABORATORIES

Dept. D, 28 North Sheldon St., Chicago, U. S. A.

HIGH FREQUENCY LABORATORIES, Dept. R.
28 North Sheldon Street, Chicago, U. S. A.

Gentlemen: Please send me your FREE literature and photos of the 1931 HFL Mastertone.

- Check here if your name is *not* on our mailing list now.
 Check here if you have been receiving mail from us.

Name.....

Address.....

City.....

State.....

(PLEASE PRINT PLAINLY)



Send This Now!

This coupon is not an order
... you incur no obligation

HFL

I F YOUR
CUSTOMERS
WILL . . .



STOP

for 7 seconds and hold a watch on a set equipped with Arcturus Tubes, you can show them that Arcturus is the FASTEST long-life tube on the market today . . . And if they



LOOK

at your meter you can show them that Arcturus Tubes withstand exceptional overloads; proof of the stamina that means LONG LIFE . . . Then, when they



LISTEN

to Arcturus Tubes in action there will be no question about Arcturus' clear, humless TONE . . . insuring the best reception of any program.



*they're
Arcturus
 blue!*

ARCTURUS
Quick Acting
RADIO TUBES

West Coast Representatives
UNIVERSAL AGENCIES
 905 Mission Street, San Francisco, Calif.
 201 Calo Bldg., Los Angeles, Calif.
 Eleventh and Montgomery Streets
 Portland, Oregon

These three performance points—Quick Action, Long Life, Clear Tone—are all you or your customers need to know about any tube. When you sell Arcturus Tubes you can *demonstrate* these features . . . no sales talk is needed. This kind of self-evident quality means increased sales and extra profits for you. Get the facts about Arcturus *Blue* Tubes from your jobber.

ARCTURUS RADIO TUBE CO., NEWARK, N. J.

HOW MANY TUBE LINES HAVE YOU CARRIED
during the past five years?

THE Perryman jobbers of 1925 are Perryman jobbers of 1930.

No jobber has ever divorced us because of alleged bad merchandise, unsatisfactory replacements, unfair trade practices, or lack of cooperation from our Sales, Engineering, or Financial Departments.

Perryman has achieved this unusual and outstanding position because our executive personnel has a sympathetic and unselfish understanding of the jobber's problem; because we help our jobbers solve those problems.

Measure our desirability as your partner in the tube business by the yardstick of our "past performances." These "past performances" are far more tangible, far more definite than "promises" as a means for you to judge the value of a Perryman franchise to you.

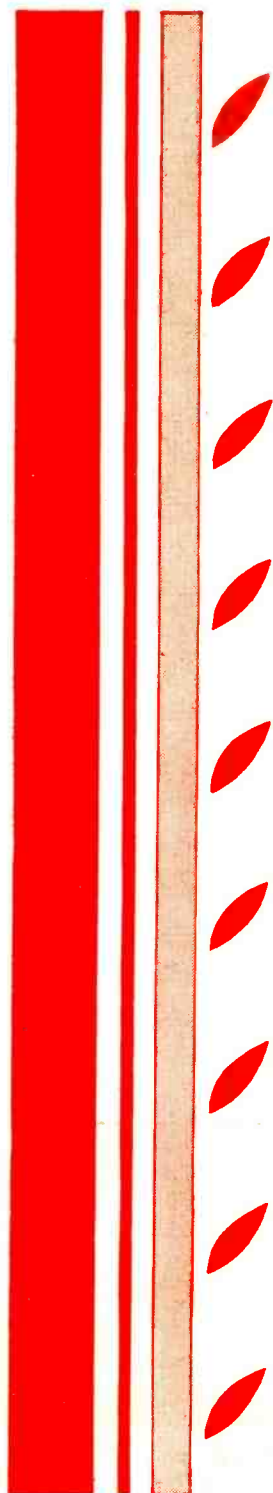
PERRYMAN ELECTRIC CO., Inc.

4901 Hudson Blvd.

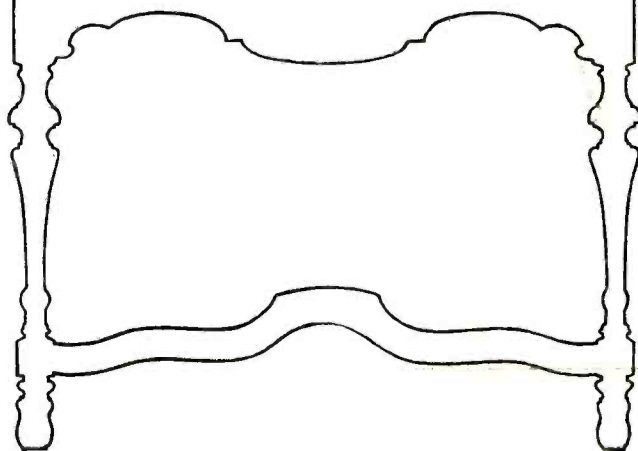
North Bergen, N. J.

PERRYMAN
RADIO  TUBES

A BARE OUTLINE OF THE GREAT NEW BRUNSWICK STORY



GET
THE FULL DETAILS
at the
ATLANTIC CITY
CONVENTION
June 2nd to 7th



Booths Section C 17, 18, 19
Demonstration Rooms 34, 35

See—

4 Brunswick models
at prices that mean substan-
tial profits and sales volume

a low boy - - - - -

a high boy - - - - -

a combination Radio and
Panatropé.

*and a combination with a
new automatic feature!*

cabinets even finer than ever.

all shielded and armored chassis.

absolute single control—one con-
trol, the Uni-selector turns the set
on and off, adjusts volume,
changes antenna tuning from
local to distant reception, and
tunes the set!

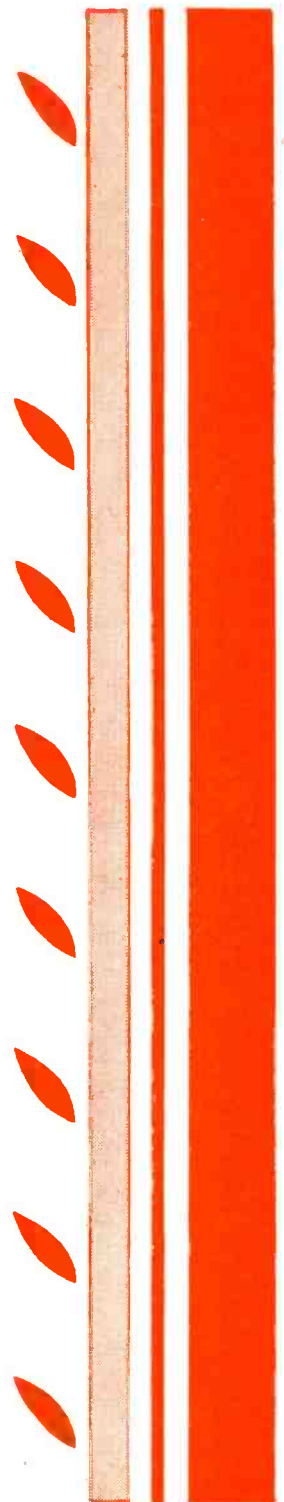
4 screen grid tubes - - - - -

resistance coupling with two '45

power tubes in parallel - - -

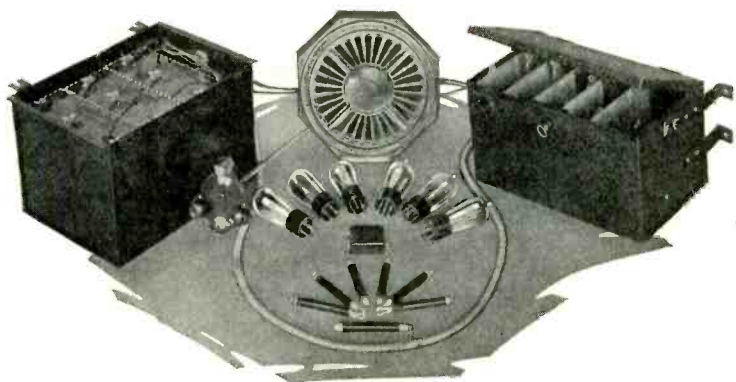
10 inch dynamic speaker - -

New and greater value in
the Brunswick 1931 line!

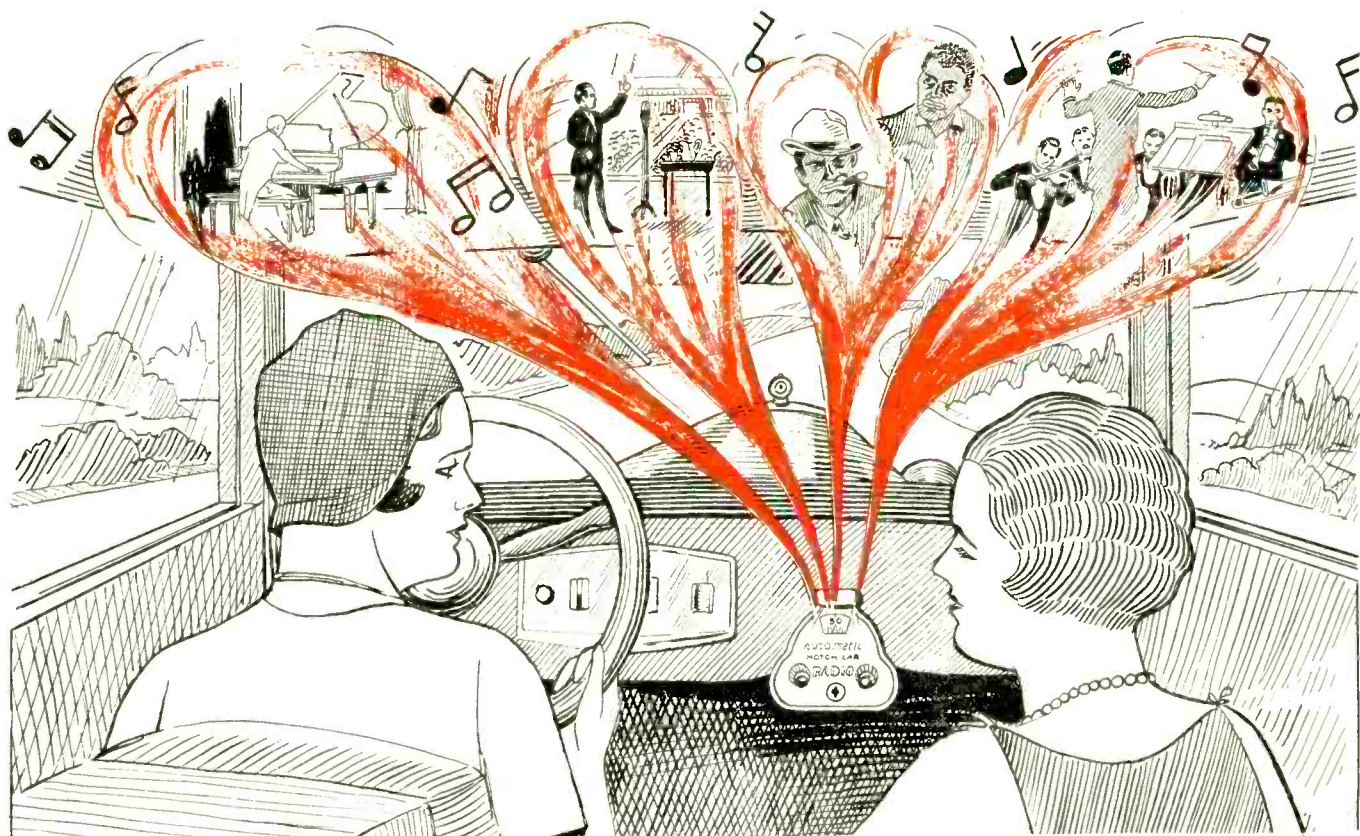


Brunswick

Every Way Is Broadway



With the new
AUTOmatic
MOTOR CAR
RADIO



Six Tubes—Three Screen-Grid—Four tuned circuits—Power Detector—
Power Amplifier—Super Sensitive—Powerful. By the manufacturers of
the famous TOM THUMB Portable

*Every auto owner a prospect—everyone waiting to buy the
new AUTOMATIC MOTOR CAR RADIO. A quality
radio—simple, reliable—durable. Easy to install in any make
of car—every dealer must be prepared to meet the new de-
mand. Extremely profitable proposition for dealers and agents
everywhere. Wire or write at once.*

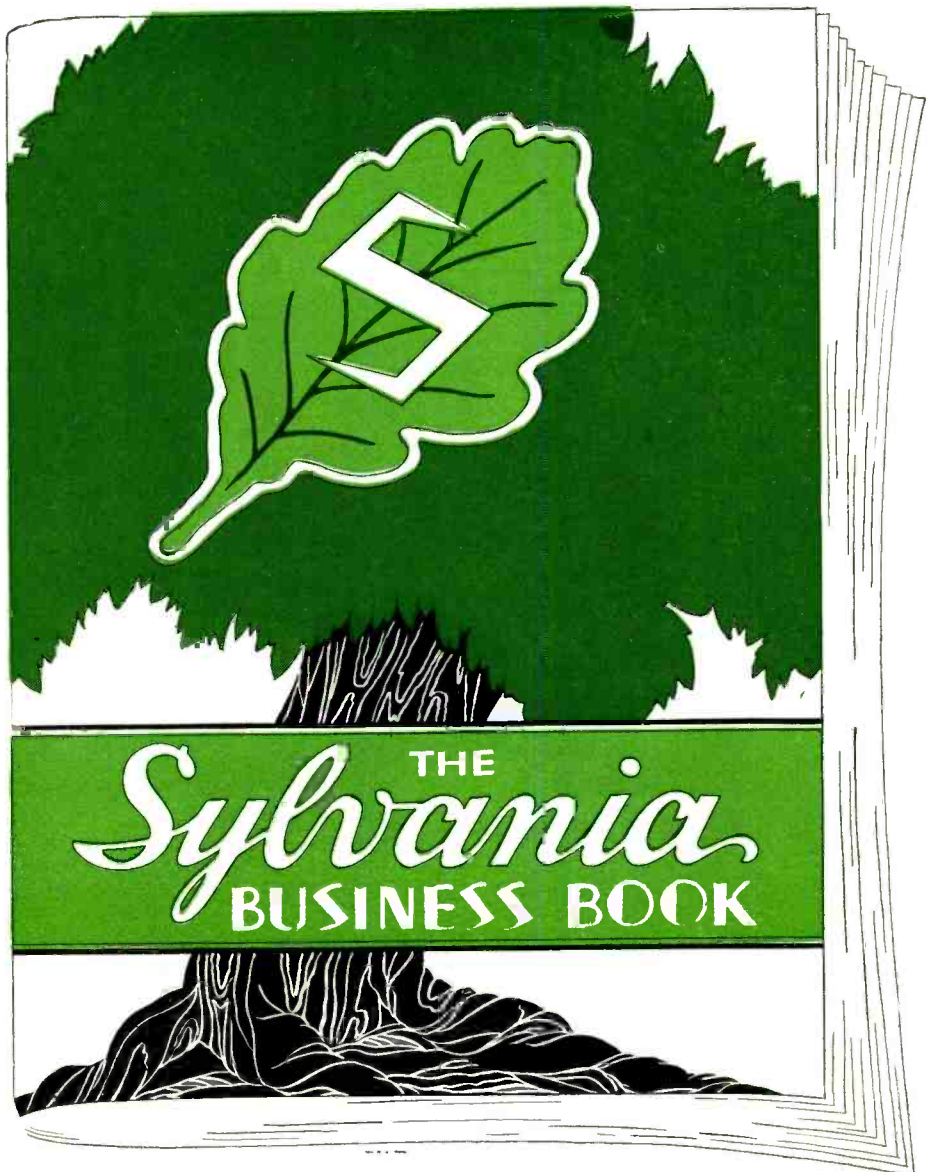
[[SPECIAL ANNOUNCEMENT!

Our new 1931 Screen-Grid Portable is now ready.
Same TOM THUMB efficiency but with power galore
and extraordinary DX ability.

AUTOMATIC RADIO MFG. CO. 112-118 Canal St., Boston, Mass.

YOUR
COPY
IS
READY

Send
for it
Now!



The new Sylvania Business Book is off the press today. Write your name and address in the coupon we've provided and we'll see that you get your copy. Or if you're planning on attending the RMA Show in Atlantic City be sure to visit us and let us present you with your copy of this book. Our representatives will be in attendance at Sylvania's Booths (A52, 53, 54, Auditorium) and also at Sylvania Lodge atop the Hotel Ambassador, 11th Floor. We'll be delighted to have you.

You'll want the ideas this book contains. You'll want to know all the details about Sylvania's new plans for even finer products and for letting the world know about them.

Write right now.



SYLVANIA PRODUCTS COMPANY, Emporium, Pennsylvania

*The Home of the Sylvania Foresters Who Broadcast Each Week
Over WJZ, KDKA, KWK, KYW, WBZ, WBZA, WHAM,
WREN, KFAB, WGY, WLW*

Sylvania
RADIO TUBES

Licensed Under RCA Patents



R-6-30

**Sylvania Products Company
Emporium, Pennsylvania**

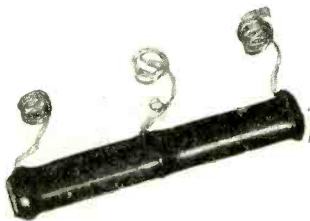
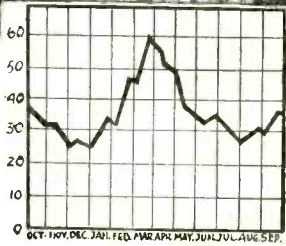
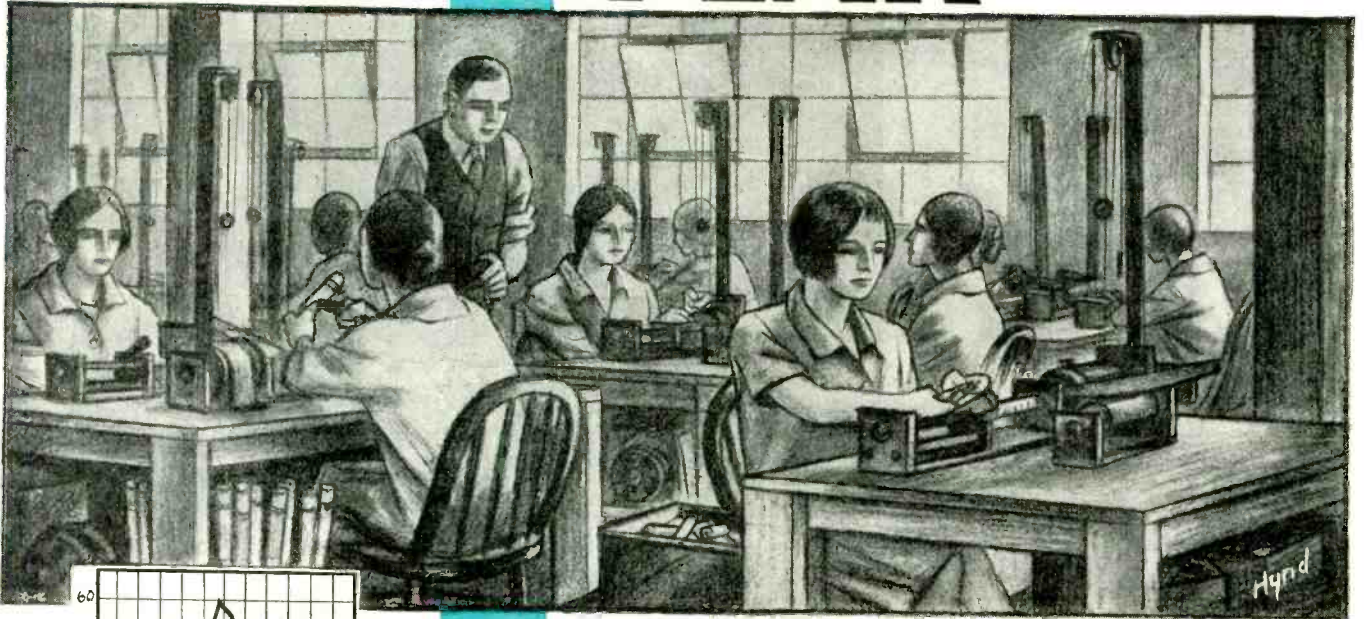
Mail a copy of the new Business Book to

Name..... Address.....

City..... State.....

W

to meet your PEAK needs



Vitrohm Resistors may be had with various types of terminals. The braid wire type illustrated finds many applications. Vitrohm Resistors may be had with any desired number of terminals.

WARD LEONARD ELECTRIC CO.

31 South Street
Mount Vernon, N. Y.

Resistors Specialists for More Than
Thirty-Nine Years

THE time is here for planning this year's set production schedules. Purchasing Departments and Engineers have had their semi-annual get-together party. Now it's up to the P. A. to satisfy Production.

When it comes to wire-wound, vitreous-enamelled resistors, Purchasing Agents should remember that Ward Leonard is a source of supply that has met the demands of industry for two generations.

We're not only specialists in the design of resistors*, but we get them out on time - - in any quantity - - at a price you can't beat.

Now is the time to write your own ticket on special designs and on delivery schedules. Get in touch with a Ward Leonard Sales Engineer - - he'll be on the job fast.

*Among the Products of Ward Leonard are Vitrohm (vitreous-enamelled) Resistors and Rheostats . . . A. C. Voltage Regulators . . . Theatre Dimmers . . . A. C. and D. C. Motor Starters and Controllers . . . Slide Wire Rheostats . . . Arc and Spotlight Rheostats and Ballasts . . . Mobile Color Lighting Equipment . . . Adaptors . . . D. C. Battery Charging Equipment . . . Circuit Breakers.

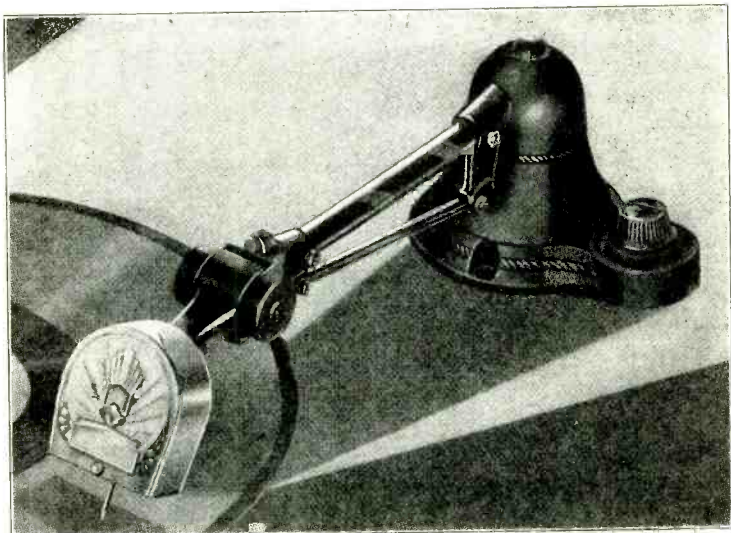
Permanence in Performance — Fidelity in Reproduction

UPCO ELECTRIC PICK-UPS

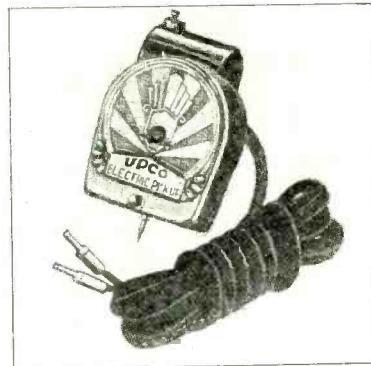
—ARE PRECISION BUILT—

HAVING specialized for over 14 years in developing and building sound and sound-reproducing devices, we are ideally equipped and prepared to design and build—any special pick-up to your specifications—from design to capacity. We will cheerfully cooperate with any manufacturer's engineering division and place at their disposal our facilities.

UPCO PRODUCTS ARE ENGINEERED BY ENGINEERS



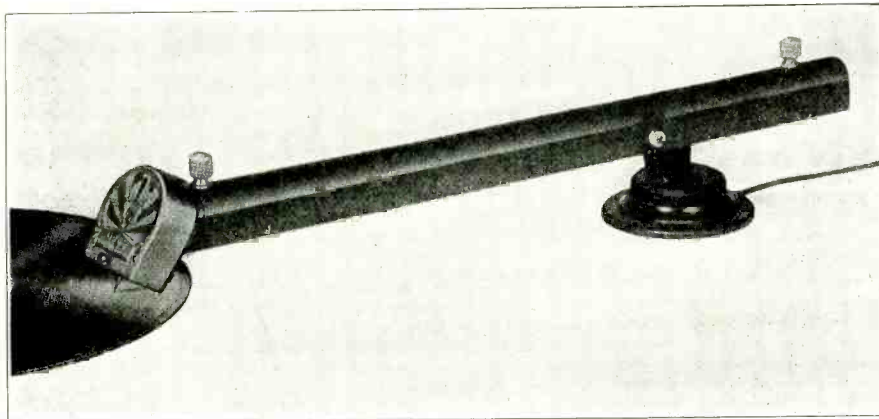
UPCO Standard Pick-up—an instrument designed and built for phonograph combinations—attachable to any phonograph with definite impedance, making it a most universal pick-up for AC sets.



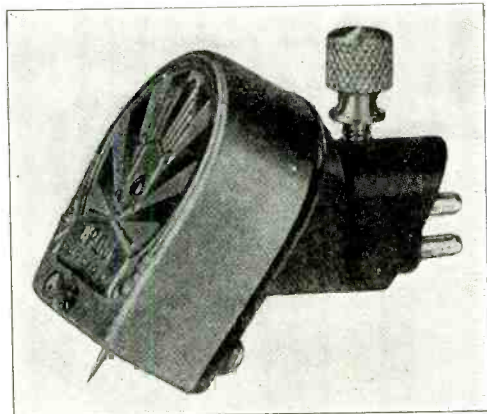
UPCO ELECTRIC PICK-UP
MODEL D
FITS ANY TONE ARM

ADVANCED FEATURES OF DESIGN

- (1) Floating construction Armature which gives long life, sweetness and smoothness of tone and freedom from need of adjustment.
- (2) Adjustable ball bearings on all movable parts.
- (3) Tone arms furnished either with or without volume control as integral part.
- (4) "SYMPHONY TALKIE MODEL" supplied for 12" or 16" records with controllable, adjustable weight control and detachable head which can be changed in a few seconds.
- (5) UPCO Electric Pick-ups can be supplied from 200 to 5,000 ohms or to match impedance of any amplifier.
- (6) The UPCO guarantee is a LIFETIME GUARANTEE.
- (7) UPCO PRODUCTS CORPORATION for 15 years has been the largest manufacturer of reproducers for Orthophonic records and UPCO REPRODUCERS are adopted by leading phonograph builders throughout the world. Now the UPCO Electric Pick-up has been adopted by leading set manufacturers as standard equipment.



The Symphony is a type designed for theater use; arm accommodating 16" broadcast records made in 200 to 5,000 ohms; perfectly balanced and adjustable to the desired weight on the record.



The Symphony head attached or detached in a second. An important feature for operators. Ruggedly built with positive contacts.

UPCO PRODUCTS CORPORATION

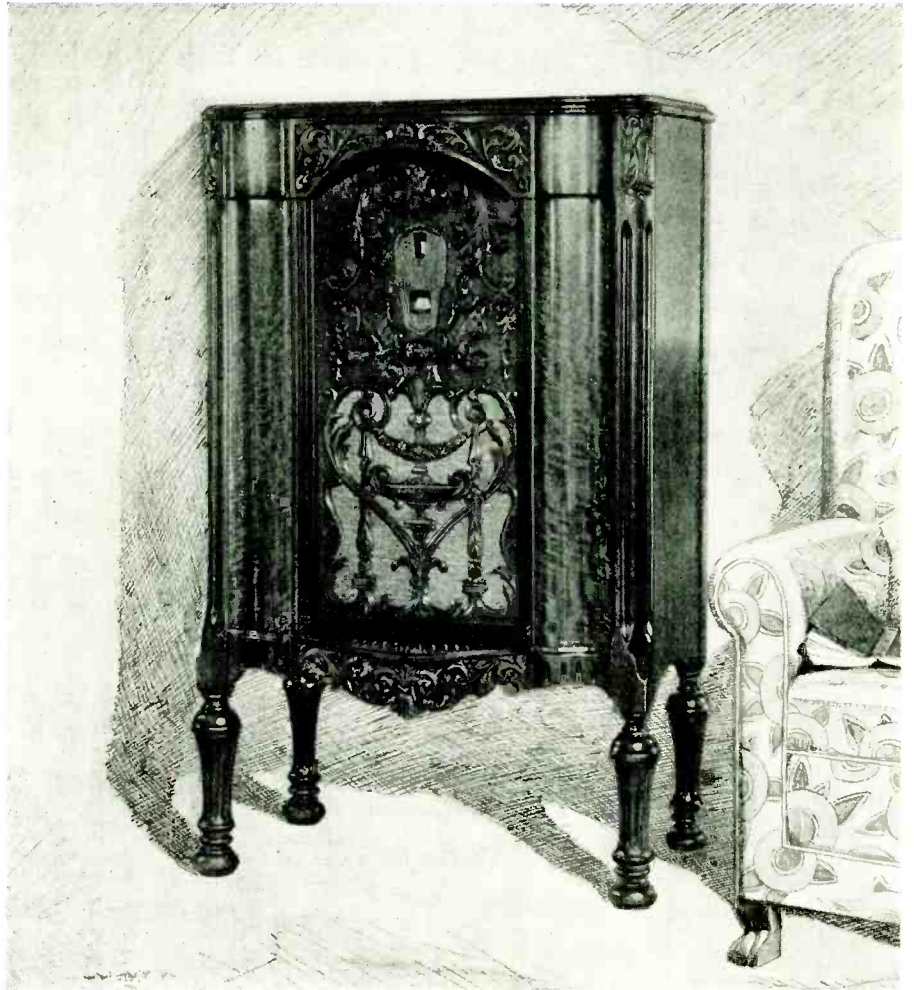
A. BORSUK, President

270 Lafayette Street
NEW YORK CITY

Some desirable territory still available
to Jobbers. Write for information.

Factory Representative for Southern California and Arizona: F. L. COOK, 430 South Broadway, Los Angeles, Calif.
Factory Representative for Northern California and Nevada: J. A. NADON, 7 Front Street, San Francisco, Calif.

NEW ★ MODELS ★ FEATURES ★ PRICES



Fada Headquarters at the Ritz-Carlton Hotel, Atlantic City, during the Trade Show, June 2-6. Also see Fada Booths 22-23-24-25, Section A, Atlantic City Auditorium.

The New Fada 42—Open Face Lowboy, \$159 without tubes

ONLY THE NEW FADAS HAVE ALL THESE FEATURES

★ **Flashograph**... as dial is turned favorite stations are announced in lights, by name, perfectly tuned.

★ **Automatic Volume Control**... constant level detection enables Fada receivers to produce and hold a constant loud-speaker volume from any signal entering the antenna, whether it be weak or strong. Fading is eliminated, all stations within range of the set are received at volume level selected by listener.

★ **Noise Filter**... a device that eliminates or minimizes noise by cutting out high frequency disturbances, permitting pleasurable reception under adverse reception conditions.

★ **Pre-selector Tuning**... insures razor-sharp dependable selectivity and prevents cross talk or domination by powerful local stations.

★ **Double-coupled Transformers**... maintains more uniform amplification over the whole broadcast band, resulting in more uniform selectivity and sensitivity all the way across the dial.

★ **Two-element Detector**... provides straight line distortionless detection so that all parts of a program (loud or low) are detected in their original studio proportions.

★ Fada Radio receivers carry the approval of the Under-

writers Laboratories of the National Board of Fire Underwriters.

★ **Nine Tubes**... three screen grid type '24 in radio frequency stages insure maximum gain, one '27 operating as a two element detector and a four tube audio system consisting of two '27 and two '45 tubes in combination resistance and push-pull transformer coupled for finest quality, one type '80 full wave rectifier... humless operation; complete shielding; local-distance switch; remote control shaft; phonograph connection automatically controlled from tuning dial and radio volume control is also the volume control for phonograph.



★ The New Fada 47—Radio-Phonograph Combination, \$328 without tubes.

1920 · SINCE

make Fada the SELF-SELLINGEST line in all Radio History - - -



IN the new Fada models, an overwhelming array of new features that make demonstrations irresistible—note them on the opposite page. In the franchise, exclusive territorial protection; price protection; loyal, intelligent factory support; distinctive, out-of-the-ordinary sales and advertising helps.

Fada offers the famous Fada tone, in cabinets of distinguished beauty, with high performance insured and made effortless by more automatic features than any other one radio possesses—a product in tune with modern needs.



★ The Fada 46—Highboy, \$228 without tubes.



★ The new Fada 41—Highboy, \$218 without tubes.



★ The New Fada 44—Sliding Door Lowboy, \$188 without tubes.

Write or wire for full information.

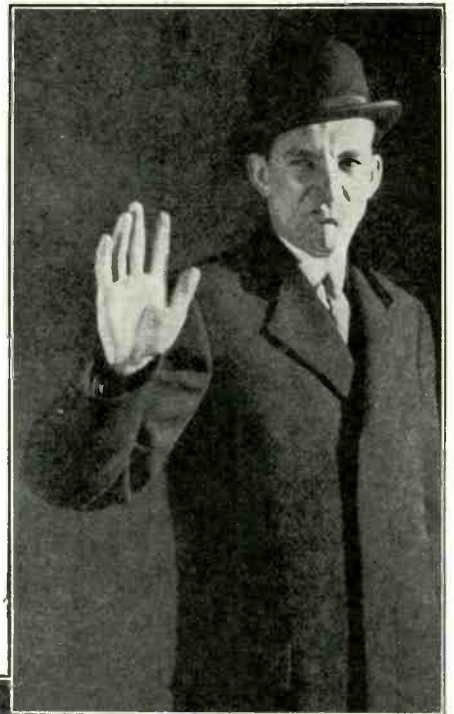
All sets illustrated above are A. C. electric available for either 25 or 60 cycle operation on 90-130 volt lines. 25 cycle slightly higher in price.

F. A. D. ANDREA, INC.
LONG ISLAND CITY, N. Y.

Same Prices West of the Rockies. Slightly Higher in Canada and For Export

FADA
Radio

BROADCASTING BEGAN · 1930



Takes more than talk to sell these men

HARD ones, all of them: the man who used to build his own, the skeptic, the cynic, the shopper. They vary as to type, but they have this in common: it takes more than talk to sell them. And the new Grebe has sold them—*is selling them—will continue to sell them—*on actual performance in every essential of radio enjoyment.

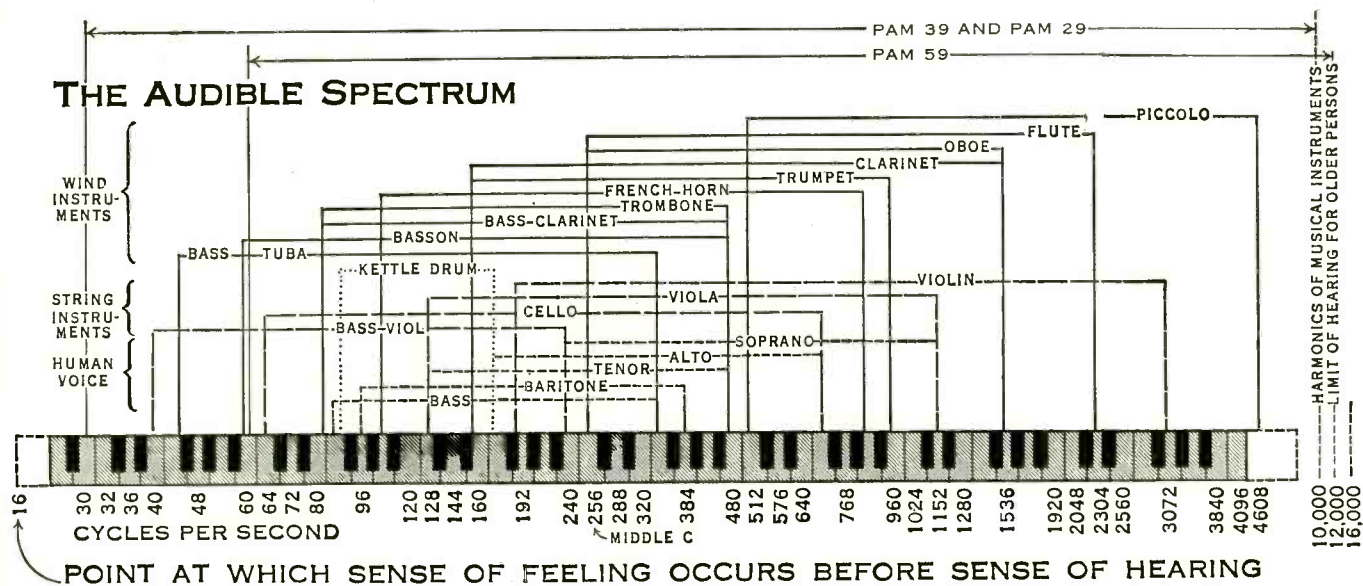
At the R. M. A. show, the SK4 line is presented with important refinements and improvements. Profit opportunities for Grebe franchise holders are further strengthened by the inclusion, in the line, of a new moderate-priced receiver which maintains the SK4 audio quality standard.

Grebe radio

SUPER-SYNCHROPHASE 

These Grebe receivers are presented without the accompaniment of high-sounding proclamations. *The superlatives have been built into the sets.*

A. H. GREBE & COMPANY, Inc., Richmond Hill, New York
Western Branch, 443 So. San Pedro Street, Los Angeles, California



The ranges of the new Pam amplifiers are considerably greater on both ends of the audible spectrum than shown above. The ranges shown are those over which the new PAMS will amplify without discrimination noticeable to the human ear.

EQUAL AMPLIFICATION OVER entire musical and vocal scale

YOU will be surprised at the new brilliance of tone due to equal amplification of harmonics as well as fundamentals. The high notes and the rich deep low ones come in as never before with perfect fidelity. Nothing is there except **UNDISCRIMINATING** amplification of original signal.

Greater compactness, improved appearance, less weight, longer life, two values of output impedance, and hum voltage cut to one-fourth are but a few of the many features built into these new PAMS which are the products of a company nearly half a century old with years of experience in amplifier construction and with financial stability to insure that your PAM amplifier will not be an orphan.

The **NEW** Samson PAMS will be demonstrated at the Hotel Ambassador, Atlantic City, during the Radio Trade Show. Visit Booth No. B10 in the Auditorium.

For those who are not fortunate enough to hear the **NEW** PAMS at the Show, we have prepared an attractive folder No. R19, called "More Power Per Dollar," descriptive of these **NEW** PAMS. This folder will be sent promptly on request.

Main Office:
Canton, Mass.



Manufacturers Since 1882

Factories at Canton and
Watertown, Mass.

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2607-11 Second Avenue
SEATTLE, WASH.

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SALT LAKE CITY, UTAH

637 East Broadway
PORTLAND, ORE.



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The

BLUE BOOK

Closed Another Sale!

FROM THOSE WHO KNOW

Best Thing in the Radio Business

"I think the Radio Dealer's Blue Book is one of the best things that has come into the literature of the radio business."
THOMAS MERGER, Vice President,
 Bankers Commercial Security Company.

Worth Twelve Times Its Cost

"The Blue Book paid for itself on the first deal. In my opinion it is worth \$7.50 a month instead of the \$7.50 a year that you ask."

CARL JONES,
 Radio Dealer, Chicago.

A Sure Cure

"A sure cure for relieving yourself of a great many of the sorrows that come to most radio dealers is to adopt the Radio Dealer's Blue Book."

RADIO & MUSIC TRADES ASSOCIATION
 (Seattle)

What the Radio Business Has Needed

"The Blue Book is just what the radio business has long needed. I am instructing our salesmen to do their best to have every one of our dealers get and use the Blue Book."

STRAVELL-PATTERSON,
 Radio Jobber.

THE Blue Book has stood the acid test of over a year's use in dealers' hands, first appearing in March, 1929, and quarterly since.

Four thousand, four hundred seventy-one dealers in all parts of the country are using the Blue Book today, 248 jobbers have recommended it to their dealers. Fourteen radio trade Associations have adopted it.

Questionnaires are sent to 8,000 dealers, Blue Book subscribers, leading merchants, etc. Averages are struck from these answers, which are then checked by prominent dealers, jobbers, Association secretaries, and lastly by a committee of leading finance companies. Blue Book quotations are accurate—dependable.

In addition to trade-in prices (292 models of 76 makes) the Blue Book contains—Complete detailed descriptions of all new merchandise with list prices, and—Schematic diagrams of new models.

WARNING!

Blue Books have been so successful that occasionally spurious trade-in books in imitation of the genuine are offered dealers. The original and only genuine Blue Book is protected by Trade Mark No. 231,486 issued by U. S. Pat. Office. The Blue Book is the only Blue Book of trade-in values approved by Radio Trade Associations. Demand the genuine, official BLUE BOOK.

"But she sure was hard to sell until the Blue Book convinced her that our trade-in price was fair"

MR. AND MRS. RADIO BUYER know that the Automobile Blue Book sets a fair value on their car. Therefore, they accept the Blue Book quotations as fair, honest, and authentic, when applied to radio.

The Blue Book takes trade-in allowances out of the bounds of competitive wrangling. It is unbiased—Convinces—Makes Sales—Converts shoppers into buyers.

You can't lose money on a Blue Book quotation. Prices are established at one-half of what the set can be sold for, stripped. That leaves a PROFIT for you.

Fourteen Radio Trades Associations have adopted and approved the Blue Book. Finance companies use it and urge dealers to stick to Blue Book quotations.

The Blue Book will SAVE you money and MAKE you money. It pays for itself on the first deal.

Pocket size, attractive blue, leatheroid loose-leaf binder—looks like the official publication it is. Four complete issues a year, always up to date. A year's service for \$7.50

Write, wire, or send the coupon. We'll rush a Blue Book.

Correspondence invited from Radio Trade Associations and Jobbers. A few metropolitan territories open to responsible sales representatives.

TRADE-IN VALUES

Model	Trade-in Value	List Price	Trade-in Value
1931 Model	115.00	230.00	115.00
1932 Model	115.00	230.00	115.00
1933 Model	115.00	230.00	115.00
1934 Model	115.00	230.00	115.00
1935 Model	115.00	230.00	115.00
1936 Model	115.00	230.00	115.00
1937 Model	115.00	230.00	115.00
1938 Model	115.00	230.00	115.00
1939 Model	115.00	230.00	115.00
1940 Model	115.00	230.00	115.00
1941 Model	115.00	230.00	115.00
1942 Model	115.00	230.00	115.00
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1993 Model	115.00	230.00	115.00
1994 Model	115.00	230.00	115.00
1995 Model	115.00	230.00	115.00
1996 Model	115.00	230.00	115.00
1997 Model	115.00	230.00	115.00
1998 Model	115.00	230.00	115.00
1999 Model	115.00	230.00	115.00
2000 Model	115.00	230.00	115.00

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 Enter my order for a year's subscription to Blue Book. Price \$7.50.

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Radio Dealers' BLUE BOOK

Cunningham RADIO TUBES

CUNNINGHAM

Booth No. B17-18-19

RMA SHOW

Atlantic City

June 2-6



**Cunninghams stand out
in a crowd!**

Quality is enhanced by comparison. That's why Cunninghams always come up smiling.

Visit our booth and let our engineers prove our claims of excellence.



Business in all lines

Business Condition of City on Upgrade
Savings Depositors Recover Losses in Stock Market Crash 3 Months After Debacle, Wessels Van Blarcom Reports.

Economic Condition of City Slowly Returning to Normal

SEATTLE HITS RAPID STRIDE
The city has hit a new civic pace. It is brisker and a new spirit of confidence, enthusiasm and optimism prevails. It was the opinion expressed by William A. Brewer of the Pacific, account executive of the Wasey and Company, advertising agency. "Seattle is going definitely up," he said. "Business is spreading to other streets. As a business is centered on downtown, no matter how big the depression on the coast."

PEQUOT MILLS ADOPTS PLAN TO RAISE WAGES AND REDUCE COSTS
Labor Extension Idea, First of Its Kind Ever Attempted, to Be Put Into Practice by Big Salem Concern

BUSINESS GOOD, SAYS SHOOP
Business in America is prospering because it is better organized.

IMPROVEMENT IN TRADE FELT TO BE ON WAY
Henry Itelson and Dr. Julius Klein, Addressing Commercial Factors Corp. Dinner, Agree Turning Point Has Passed.

During the RMA Show the spotlight is focused on the individual products that constitute the gigantic radio industry. Here leading manufacturers and merchandising geniuses meet with the common purpose of improving present standards.

Cunninghams welcome comparison

80 Percent Of Machines in 403 Shops Working
Increase of 15 Percent in Tariff in Pending Bill Gives Industry Stimulus

WOMEN'S CHANGING STYLES HELP MAKE SHUTTLES CLICK
The embroidery shuttles in Hudson County, the nation's center in the industry, are again clicking faster and faster, as recent tariff revisions point the way to added production to American embroidery manufacturers.

HOPEFUL VIEW IS STRENGTHENED
Dun's Reports Business Shows No Change of Broad Significance—Weather Is Factor

BUSINESS GOOD, BOOTH STATES
Mrs. Booth May Visit Ohio Prison to Quiet Unrest, Says Volunteer Chief.

MILFORD SILK MILL. OUTLOOK IS BRIGHT
MILFORD April 23—After being closed for a short period, the Milford silk mill of Tirrell Brothers Corporation, which has operated part of the past year, is now running to full capacity again. Business conditions in the silk industry have been very certain for the past year, during which the Milford mill has found it difficult to keep operating steadily. The mill was shut down for part of a week with the outlook for a week, with the outlook for a week, while or even shut down entirely for a while in the past few days the company has received a tentative order for Ohio state penitentiaries. The contract is finally awarded to the local concern, the mill will have enough work to keep running to full capacity for several months.

showing improvement

Ballston Knit Glove Factory in City Is Operating Again

The local branch of the Ballston Knit Glove company here is running with a light force again but business is expected to pick up in the near future. It was announced last night by the manager, Charles O. Mason, of East street.

The home plant of the company at Ballston Spa is also running, Mr. Mason said. Both factories are in the hands of receivers following the alleged financial failure of the head of the company early this year.

The Ballston Spa National bank, said to be one of the chief holders of notes against the concern, has appointed officials to form a board of receivership and in the factories. Both plants will be operating at full capacity by the middle of the summer, Mr. Mason believes.

BUSINESS CHIEF WARNS AGAINST TRADE 'BAITING'

W. C. Butterworth, Commerce Chamber President, Speaks at Washington Convention.

STRESSES CO-OPERATION

Warns Against Break Caution in Trade

Sees Improvement

By the United Press WASHINGTON—Julius H. Barnes, chairman of the National Business Survey Council which President Hoover organized last fall to offset depression; described the business slump of the last few months as a "temporary interlude," in his address Thursday evening at the annual dinner of the Bureau of Advertising of the American Newspaper Publishers Association, in New York.

Mr. Barnes said that a "trend of recovery" is now clearly evident and predicted that broad lines in the large cities, diminishing, soon will disappear.

Optimistic speeches are, of course, plentiful enough, but Mr. Barnes has giving close attention to the business and the problem of unemployment. He is in a position to speak knowledge of conditions throughout the country, and is not likely to be misled by facts of this kind without knowing that a large construction is under way, especially in the West, but such plans require time to put the work, and in many instances wait favorable weather.

Looking toward a long range view, he held that the progress of America during the last 20 years has been production supporting real wages and buying power, should be continued during the coming year.

Automobile and Steel Lines Are Showing Improvement

Business Circles Still Confident That Commerce Will Gradually Grow Better in Coming Weeks

By EDSON B. SMITH

Continues rather inconclusive. A statistician of March was disappointing. April, however, although trade still lacks snap, circles continue sanguine that the conditions will gradually grow better during the coming weeks. The National Economic Society is quite confident that evidences of business betterment will be apparent.

Motor car output higher than for the same month in 1929. At the annual meeting of the States Steel Corporation, Taylor said that he expected a rate of steel-making to be shown as had States Steel Corporation with February adjustment in business. Retail trade conditions are better than for the same month in April this year.

Kiwanians For Hudson County Consolidation

Hoboken Club Balloting Endorses Merger of Municipalities—State Growth Forecast

The Hoboken Kiwanis Club yesterday voted unanimously in favor of consolidation for Hudson County. Not all of the members have cast their ballots, thus far, but there is a decided sentiment throughout the club in favor of merging Hudson County municipalities into one big city.

Aside from the balloting, the club gave its time to hearing an address by C. S. Anderson, of the New Jersey Bell Telephone Company. Mr. Anderson spoke of New Jersey's economic standing among the states in the Union, and can be expected of it in the future.

Bankers' Journal Sees Improvement in Business

Recovery in business has made further progress the past month and there is general confidence that the improvement will broaden out as the year goes on, the American Bankers Association Journal says in its current review.

"The steel industry, which led off this year with a notable gain, has lowered its rate of operations somewhat but expects to be able to hold schedules around the present 75 to 80 per cent of capacity," the review says. "Automobile plants have built up production much more slowly than last year so that crowd dealers, and the situation is being sound."

BUSINESS OPTIMISM IS FELT BY MILLER

Improved Credit Collection Also Seen by Credit Men's Executive Manager

It seems fair to say that there was more business optimism in March than in February, according to Dr. Stephen I. Miller, executive manager of the National Association of Credit Men, in his monthly letter to members issued yesterday.

"An early spring is doing much to stimulate public works and building," says Dr. Miller. "The expectation of an early tariff conclusion is helping matters. The moisture in the Far West and a good general agricultural outlook fortified commerce. The reduction of unemployment, better bond and stock values and low money rates are all fundamentally economic conditions looking toward a recovery."

These are the comments that predominate in talks with business leaders on the train, in corridors and at their desks, according to Dr. Miller. There has never been a better example of the power of the American people to recover from a business slump, he says, attributing it to a greater and greater diversification of the products of the Federal Government and the spread of business leadership confidence in the future.

Miller that the confidence of the people from confidence it has not been there is a change in the last report. He says it is a change in the last report. He says it is a change in the last report. He says it is a change in the last report.

What's Ahead for Business

On the eve of the annual meeting of the Chamber of Commerce of the States, Julius H. Barnes, chairman of the National Business Survey Council, makes public a review of the business situation. It should help the Chamber find the answer to the question that will discuss. It is a question that will discuss. It is a question that will discuss. It is a question that will discuss.

The report of the national surveyants the conclusion that there is for business a return to normal conditions of activity with resulting prosperity. In the domestic field are certain outstanding factors situation. The construction program formulated by the larger elements of American industry last fall is being tried out. The easing of conditions in the money market which began last October.

Today

Paying For Mistakes. The Next Election. One Baby Octopus. Murderous Superstition.

By Arthur Brisbane

February 1929. Kitz Features Syndicate, Inc. BUSINESS and employment conditions are improving. Authority for the statement comes from the President, members of the Cabinet and the greatest industrialists.

But mistakes must be paid for. The time, money and thought of millions, including many normally intelligent, were devoted to stock gambling. Suddenly more than a billion dollars were

Land Recovering Than Other Areas

Some collections by the industrial loan companies which are located in all the country. Pierre E. Hodson, president of the States are recovering from the business

Keeping Everlastingly At It Brings Success

BUSINESS IS BETTER

THE WEEKLY report on business conditions issued by the Department of Commerce, for the week ending April 19, has some nice features.

The volume, as indicated by check payments, was nearly seven per cent higher than for the previous week, although still not up to the rate for the same week in 1929.

Prosperity and Taxes

"Los Angeles is now leading the United States in percentage of retail business," according to T. C. Palmer, president of the Retail Dry Goods Merchants' Association, in discussing the record of the year for the first quarter.

Last year Easter, with its heavy seasonal business, came in March, yet this year, notwithstanding the absence of this great volume

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Cunningham

RADIO TUBES

Cunningham RADIO TUBES

Since 1915 Cunningham Radio Tubes have embodied the latest radio principles and have fulfilled every promise of integrity and in-built quality.

E. T. Cunningham, Inc.

New York Chicago San Francisco
Dallas Atlanta



RADIO

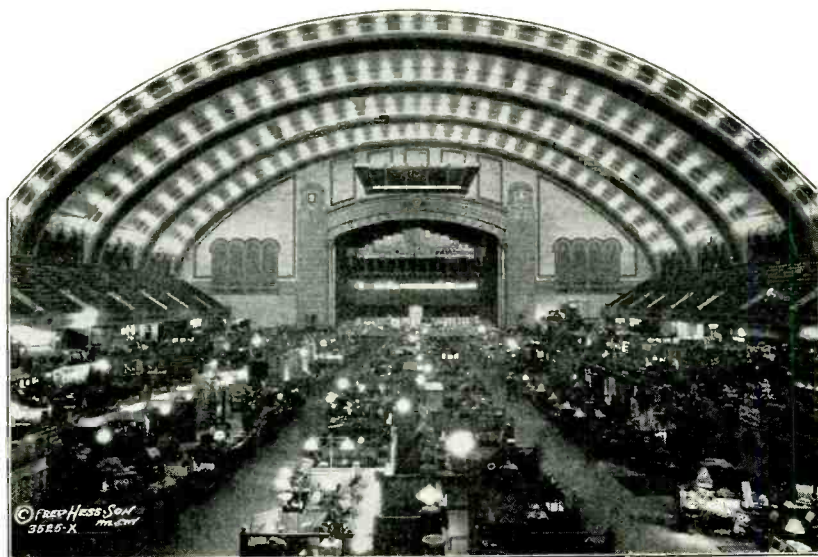
the national trade magazine

VOL. XII

JUNE, 1930

No. 6

Atlantic City
June 2-7



San Francisco
June 30-July 2

New Radio Season Begins

IN accordance with established custom the radio season is considered as starting with the annual trade show which is sponsored by the Radio Manufacturers' Association. At Atlantic City this year many manufacturers will make the first disclosures of their new models and plans. From these it is possible to determine what will be most prominently featured at the subsequent public shows as well as in the retail stores later in the year. This showing, like that at San Francisco a month later, is for the trade only.

Never before has a season opened under conditions similar to those that now prevail. There are fewer manufacturers in the field and the opportunity for choice of lines to be sold is correspondingly narrowed. Where are the nationally known sets of yester-year?

ADVANCE information regarding the exhibits indicates that the new equipment is to be distinguished by but few new selling points. Most of the new receivers are designed to be more sensitive and selective than last year's models and have greater fidelity of tune reproduction. Especial attention has been paid to increasing the ease in tuning. But these improvements have been brought about by minor refinements in the circuits rather than by means of the revolutionary changes which characterized the early years of radio.

Yet there are enough differences to introduce new selling points and to stimulate new purchases by old

users. More sets are now equipped for automatic regulation of volume and for remote control of tuning, as well as for control of tone value. The general tendency seems to be toward smaller and less expensive cabinets. A number of manufacturers are featuring the midget set which has created such a furore in Southern California. Others are employing double-duty cabinets to house the chassis and to be used as an auxiliary table in the home.

The electrodynamic type of speaker continues to be the favorite, the electromagnetic being less in evidence, and the condenser type not even as prominent as last year. Extra large units are available for public address systems but the small units are more popular for installation in radio sets.

ONE noticeable feature is the large number of relatively new sets for battery operation. While many of these are specifically designed for installation in motor cars or motorboats, there are others intended for use in homes which are not wired for alternating current. The a-c set for home use, however, is still greatly in the ascendency.

The use of portable d-c sets is facilitated by the new 2-volt tubes whose oxide-coated filaments have a current consumption of only .06 amperes for all except the power tube. While various pentode, or three grid tubes, are exhibited, both as r-f amplifiers and as a-f power tubes, they have not yet been generally adopted for use in standard receivers.

**RMA TRADE SHOW
LEADERS**



H. B. RICHMOND
President, Radio Manufacturers Assoc., Inc.



J. B. HAWLEY
Chairman, R. M. A. Show Committee



MORRIS METCALF
Chairman, R. M. A. Reception Committee



G. C. IRWIN, JR.
Manager, R. M. A. Show

*Those responsible for this
season's Radio Trade
Shows from the
Atlantic to the
Pacific*



**PACIFIC RADIO TRADE
SHOW LEADERS**



A. H. MEYER
President, Pacific Radio Trade Association



H. R. CURTISS
Chairman, P. R. T. A. Show Committee



ERNEST INGOLD
President, Western Music and Radio Trades Association



William Taylor Hotel, San Francisco



GEORGE H. CURTISS
Manager, P. R. T. A. Show

Skip, Gyp and Crook

Some actual experiences with selling radios on the installment plan to dead-beats.

By VOLNEY G. MATHISON

THE Gray Radio Store in Redbank was about to close. It was nearly nine o'clock in the evening and time for even a radio dealer to be getting home. Jack Gray, the young owner of the store, was alone in his little office, hammering out a lot of dun letters on the typewriter to customers who were enjoying his radios but were forgetting to pay for them.



Suddenly he heard the front door open and looking toward it he saw a long gangling young negro in rather shabby jeans. In his black-skinned hand he gripped a rolled up banknote.

"Ah wants to buy a ra'jo, boss," he said, grinning a little furtively at the young proprietor. "Jes' wants a ra'jo right away."

"Do you want to buy for cash?" inquired Gray.

"No suh, boss. Ah's jes' got ten dollars here, till payday. They all says down in West Redbank that you sell 'em on time, boss."

Now the Gray Radio Store was not far from the colored district of the town, and Jack Gray had sold radios on time payments to negroes—to some of those employed by the railroads, and not usually to others. But this prospective customer didn't look very good to Gray; he was too easily pleased and seemed willing to buy any radio in the place, from a Humming Lyre at \$89.50 to a Tube-Eating Spitfire Deluxe at \$925.

"You jes' gimme a good ra'jo, boss," said the colored one. "Jes' gimme this ra'jo here," and he put his hand on the nearest one, which was priced at \$119.50 "I mus' have it tonight, boss. Can I git it tonight?"

Jack Gray had pulled off some swell sales, both cash and time, on several occasions as he was about to close his doors, and his car had a rack on the back with which he could make immediate de-

livery, his customer helping to handle the set, if it was a console model. This made inexpensive installation and always pleased the buyer. But Gray did not intend to deliver this "ra'jo" without having made a thorough investigation of the would-be purchaser.

However, he did not want to lose the sale, if it was going to be a good one, so he took his customer into his office and wrote up a contract.

"Mah name's Joe Green," said the ungainly young Son of Ham. "Ah lives at 521 Adeline Street an' Ah works fer th' S'uthin' Pacific—dinin' car service."

The negro was sure he had never bought anything on credit before in his life, but by long and adroit questioning, Gray tripped him up and got him to admit that he had once bought a watch from Burgess, the railroad timepiece inspector in West Redbank. When it came to signing the purchase contract, the negro printed in large picture-like letters, "Joe Green."

"What's the matter—can't you write in handwriting?" queried Gray.

"No suh, boss. I jes' knows how to make 'Joe Green' thataway."

Promising to deliver the radio immediately, Gray got rid of the negro, then he locked his store and went home, and to bed. Next morning he got the jeweler Burgess on the phone.

"Joe Green," said the jeweler, "Sure, he bought a watch and paid for it. He had to; the railroad company held out the money. Can he write? Sure, he signs a good hand. He's a little short fellow."

When "Joe Green" came into the store at about ten o'clock, scowling blackly and trailing behind another small dapper darkie, Gray held the two of them with a gun and called the police.

"I'm Joe Green," said the dapper young negro to the policeman that soon arrived. "I sent mah frien' here to buy

that 'ere ra'jo for me, 'cause I was too busy to come."

"Where do you live?" demanded the policeman.

"821 Fifth Street," said Green.

"And you?" demanded the officer of the other gangling fellow.

"1537 Eighth Street."

"And where did you order the radio sent?"

"521 Adeline," said Gray.



"We wuz a goin' tuh move over there," said Joe Green's accomplice.

"Oh, you was, hey?" said the cop. "Now ain't that nice? Who lives there now?"

"Nobody."

"An empty flat, hey?"

"Yassuh."

"How many radios have you had sent to that empty flat before this one?"

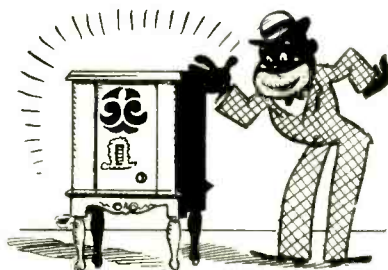
"None—not one, suh."

"You come along," said the policeman, and he put in a call for the patrol wagon.

THE foregoing is not a bit of fiction; it happened one evening, and it is a rather crude example of one form of crookery that is practiced on radio and other concerns selling on installment payments. "That was a raw stunt," said Gray. "I've seen too many slick ones to fall for that."

But to Gray's surprise, the two negroes were released the next morning. The police had nothing on them, and an attempted embezzlement of this type cannot be prosecuted.

It was not a forgery case either, as the negro had printed the name of "Joe Green" and had done so at the express request of the real Joe Green. The negroes came swaggering back into the store and got their down payment refunded, and not only that, but, legally speaking, they might have brought and won a suit against Gray for refusing to deliver the machine to them, inasmuch as he had taken their money and given



over a copy of the contract. That's law—just smirk that off!

The problem of granting credit to purchasers of radios is one that I think the average small dealer does not grasp clearly. It is an exceedingly important part of their business that many clever young radio merchants fall down on. Radio dealers are by far and large young men who have not been in business very long; they are good salesmen who have gone in on their own and they have a lot to get hep to concerning the dangers of doing business on credit. This exactly expresses the sentiment of every finance company today.

It is an uncomfortably interesting fact that on account of their guillibility and carelessness, radio dealers right now are the special victims of dead-beats and piker crooks, while "picking up a blarney" or "doing a blarney" are two of the latest underworld slang phrases that maybe the reader can figure out the meaning of for himself.

This article and the statements in it are drawn from an experience with more than four thousand radio time-payment contracts, involving over two hundred thousand dollars' worth of business. During the time these contracts were written, I think that every conceivable kind of crookery that can be worked on a radio dealer was met, and a pretty elaborate credit-granting system was developed for checking or limiting the losses suffered.

The small dealer in an outlying district may think that this problem is nothing to him, he "knows" all his customers. This is a delusion and if the dealer doesn't follow a strict system in his credit-granting and home demonstrating, he will sooner or later find himself out a nice fat radio.

The losses suffered by radio dealers through the increasing activities of embezzlers and "skips" run at a rough guess over a million dollars a year. These losses are rapidly increasing on account of the insane competition of furniture houses who are steadily lowering down payments or who are doing away with down payments altogether, and sometimes, as a consequence, with all other payments as well.

Hazards in Demonstrating

DEMONSTRATING radio sets in the home is the bunk in almost every respect, and yet it seems destined to become the predominant method by which radios will be sold. I fancy that home demonstrating came to be demanded by the public, in the first place, largely on account of gyp dealers who hopped up inferior bootleg-make radios in their stores and made them sound about twenty times better than these same junk-piles ever sounded after

the gyppee got them home with his cash-register receipt reading "\$98.89—No Refunds." Then, too, of course there is that old fiend "Power Noise" that sometimes wrecks the performance of even the best radio.

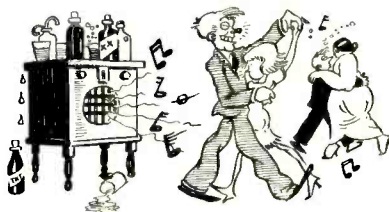
But the gyp radio concerns are vanishing; most radios can be judged on the dealer's floor nowadays, and a question of power noise can be readily settled in twenty minutes or an hour. It doesn't take three weeks or three days to find out how a radio is going to work in a certain house.

But radio manufacturers are pushing home demonstrations on the theory that they will bring more sales—and they do, but it is up to the retail dealer to see to it that he makes only sales and demonstrations that are worth while. When you demonstrate to a canny Scotchman with a wee bit in the bank, and who doesn't hardly know whether the joy of owning one of your sax-tonkers is worth a hundred and fifty of his precious dollars; when you demonstrate to him and get your cash in full in twenty-dollar bills, you are glorifying the one good thing about the home demonstration: it sells the overtimid or overprudent buyer.

But for every such type of buyer you hook with your home demonstration, you get hooked in turn by six joyriders who never intend to buy a good radio and who wouldn't pay for one if they did.

This is the mildest and the commonest form of crookery that the radio dealer suffers from, this trick of asking for a home demonstration with no intention to buy. The dealer must demonstrate to exist, and let him do so, but with discretion, and not promiscuously.

IN THE first place, discourage requests for demonstration on Saturday night, or before big events, such as a widely heralded prizefight, or before week-end groups of holidays. Beware of calls for demonstrations made over the telephone; the later in the day they come, the more phoney they are liable to be. Such calls are commonly from persons staging wild parties who want free entertainment, and the dealer is liable to get his set back with the polish burnt off from bootleg jackass having been slopped over it.



Dealers should not advertise "Telephone for a demonstration." This encourages the practice of calling up a sucker dealer and getting a big set out

for a party, for a dinner, a birthday celebration, or even for a wedding. If you think that few people are mean enough to pull off a trick like that, you simply don't know your onions. The Gray store made from ten to fifty demonstrations a day, and from that amount of contact found out a lot of things that would make a man a misanthropist.

I think it is not only profitless, but actually bad business for a radio dealer to carry advertisements in the classified sections of the telephone book for the same reason; don't advertise there, or else advertise service only, and let the other fellow do the free entertaining. There was a time when good sales were put over by telephone calls, but these are getting more and more rare.

A huge doubletruck "radio section" featuring some widely known radio brings telephone calls from curious persons who sometimes already own a late-model set of some other make; they will hide their own set in a closet and have the new one brought for a try-out against the other. This is a heartless trick, but it's practiced on radio dealers without compunction. The really serious prospect usually goes into a store or a lot of stores to order a set out for demonstration, or he has to be high-powered by a good outside salesman.

Remember, the harder a prospect is to close the more likely you are to get your money; the fellow who calls up on the phone and sounds ready to greet you with a check in his hand is usually kidding you.

When you put a radio in a house and then can never find anybody at home thereafter to talk turkey about a down payment, you can be sure you are up against a joyrider of the worst type. This is the type that ducks into the bathroom and will not answer the doorbell when the salesman calls, the type that switches off the lights and pretends to go to bed when he hears his car coming (they know it by that clumping, rattling, wheezing sound, having heard it so many times). If you have trouble seeing a person who has a radio of yours in his house, it is a good idea to park your crate around the corner and slink up like a tomahawking Comanche, on foot, keeping out of sight as much as possible until you are within jumping distance of the door—preferably the back door.

A dealer doing any amount of business will speedily observe that certain parts of his town contain a larger percentage of joyriders and bad accounts than other parts; these are usually the streets filled with third-class apartment houses near the business districts. Demonstrating to persons living in furnished apartments is hazardous, and selling them on time payments is still more so. The Gray Company found out by costly experience

that selling to occupants of apartment houses in one section of the town was a 98 per cent loss through repossessions and outright skips after the down payment had been made, while several sets were lost in demonstrating to persons who vacated and took the radios along. One of these sets was found a year later by sheer accident in a bootleg joint at the other end of town.

The rule was adopted by the Gray stores that when a prospect was living in an apartment house, the salesman had to get a credit statement in advance for checking. And it was a good rule. Find out where the prospect works and how long he has lived in the place and where he has bought on credit before, and check up all statements. Time and again there are references to stores who will report "no such account," or to stores that sell for cash only.

The crook who assumes the name of a responsible resident and uses his credit references is the most dangerous and most rare; and he will probably do any dealer but the most wary. A responsible citizen usually has a telephone though, and if you are suspicious of your prospect it is a good stunt to call the phone number of the name given, making the call from your store on some pretext, say to notify the prospect that his radio is "now on the way." If there is anything wrong it will immediately be detected by this ruse and you can call the police and have them do your demonstrating for you with a patrol wagon.

A discrepancy in addresses may be immediately revealed by examining the telephone book, but this does not mean anything, as the man listed in the book might have moved to the address given you and you may be dealing with a bona fide prospect. It is therefore essential to make the call on the phone to check up. The Gray radio stores saved one radio by this system, though the crook escaped, as he was probably on the lookout for the police.

If a prospect living in an apartment house asserts that he has never bought anything on credit in his life and can give no references of any kind, he is a highly questionable sort of egg and you had better pass him up. There are few people nowadays who can and will pay for a radio who are not equally able to give a good reference of some kind or other. There are really some who cannot, usually foreigners who have bought for cash all their lives, but you do not ever find these living in furnished apartments. If you do, there's something phoney anyway and you had better steer clear of that prospect.

If there are not too many milk dealers in your city, it is a good scheme to make contacts with their collectors and call them up if you are stuck for information on a doubtful-looking applicant for credit. By this system, the Gray store



got several earsful that saved a lot of subsequent grief chasing after bad accounts.

If you get a request for a demonstration from an unknown person living in a hotel or a rooming-house, don't act on the request before making an extra thorough check-up. I lived for a year in a big and pretty classy-looking hotel, and I wouldn't have trusted more than one out of ten of the occupants of that hotel with any radios of mine on time payments. Yet the hotel was full of sets conveniently furnished by various ridiculously careless dealers. Several times, too, the Gray stores refunded down payments and seized sets from persons who were found by delayed credit investigations to be absolutely unreliable and bad risks, and these same persons promptly obtained equally or more expensive radios from other dealers.

(To be continued)

GOOD ADVICE FOR A RADIO SALESMAN

Fowler Manning, president of L. C. Smith & Corona Typewriters, Inc., advises his salesmen to use cold merchandising facts instead of glowing adjectives. What he says about selling typewriters is equally applicable to selling radios.

"Speak deliberately! If you see from a puzzled or doubtful look on the prospect's face that anything is not quite plain to him, stop and make it plain. Take time enough to explain each point thoroughly.

"Whenever you make a statement that is open to question, be sure to get his assent to it before you proceed. If he will not assent to it exactly as you make it, modify it until he does. Get him to assent in some degree to every proposition you make, so that when you get to the general result he cannot go back and disagree with you.

"Don't do this, however, as if you were trying to corner him, but with a simple desire to reach a reasonable basis of argument.

"Cast aside all attempts at being a clever talker and all idea that there is any trick of words or manner, any secret artfulness about selling goods. Put yourself in the plain, unaffected spirit of a man who has simply the truth to tell, and is bent upon telling it in the plainest, homeliest way.

"Above all things, avoid the fatal mistake of demonstrating to your prospect with a sense of fear, haste and uncertainty.

"Realize fully the power of the facts you have behind you, and have the full confidence of your convictions; make each point clear and conclusive, and lead the prospect by simple steps up to absolute conviction."

DEALER BOOSTS SALES WITH TRADE-INS

Any practical solution of the radio trade-in problem constitutes no mean merchandising feat in itself. When the solution not only solves this pressing problem, but serves to increase sales and profits on new merchandise as well, it may be regarded as sufficiently unusual for further investigation. A. C. Owens, Tulsa, Oklahoma, exclusive radio dealer handling Atwater Kent Radio exclusively, who points with pride to the fact that he has shown a substantial net profit for every month since he has been engaged in the radio business, is the man who has solved the problem.

There is nothing new in the rental idea as applied to trade-in radio sets, but Owens has carried the thought a step farther and has succeeded in ultimately turning most of his "renters" into purchasers. In order to secure a rental set the prospective purchaser—and Owens has come to regard all "renters" as such—must deposit \$10 prior to delivery. Rental rates are \$2.50 per week, \$7.50 per month.

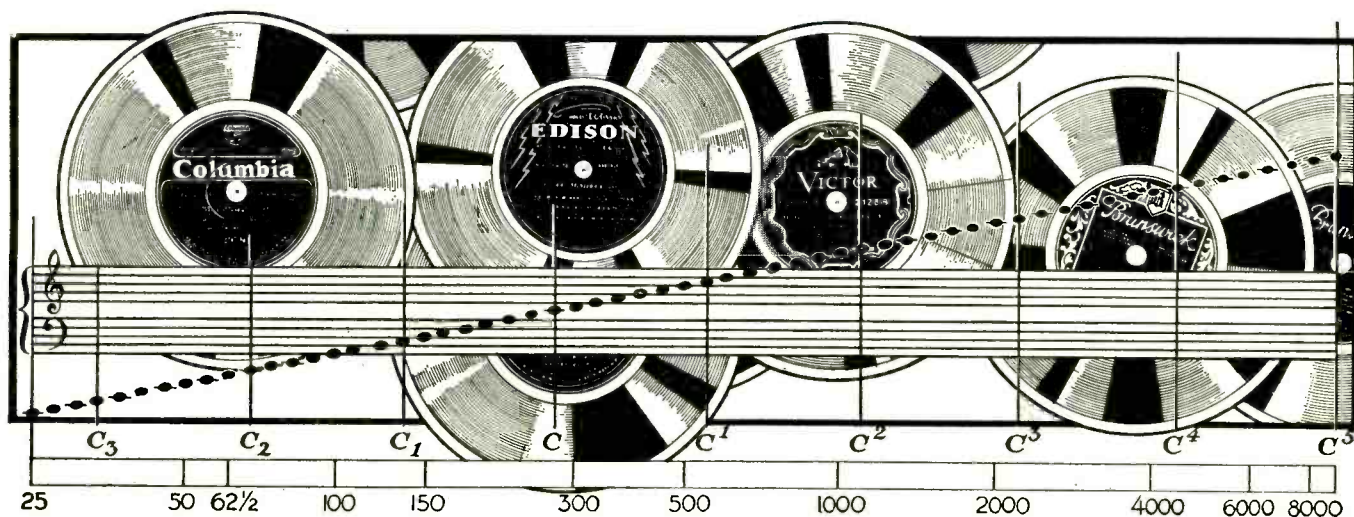
After a set has been in the home long enough for an accumulation of rental funds, Owens arranges a home demonstration of the new screen-grid set and usually clinches the sale by offering to apply the accumulated rental funds as down payment on the new set.

Four outside salesmen are employed on a straight commission basis as is one floor man. Unlike most dealer set-ups, the floor man works on the floor exclusively and the outside men outside.

Prospects for all salesmen, inside and out, are provided daily by means of a systematic telephone prospect canvass which is in progress at all times. And as prospects are always plentiful so is the turnover of sales personnel correspondingly slight. In addition to the telephone campaign, newspapers, billboards and direct mail are used effectively.

Never knowingly overlooking a bet which might lead to increased profits and prestige, Owens watches carefully the society columns of his local newspapers.

Whenever and wherever a bridge party is given he arranges to install a radio for the event, at no cost to the hostess, with the single proviso that the hostess agree to turn over to him the names of any and all of her guests who have expressed or otherwise evidenced unusual interest in the set. Invariably Owens closes two or three sales following such group demonstrations.



Selling Radio by Recorded Music

ONE of the most popular records this month is the Stein Song, played as a pipe organ duet by Mr. and Mrs. Jesse Crawford. It does not take much imagination or musical training to appreciate the zest that the two Crawfords have put into this peppy march; it almost makes you stand up and yell for the University of Maine. Getting technical: Mrs. Crawford, or Mr. Crawford, almost pushes her, or his, partner off the bass end of the manual in spots. The bass is nothing less than tremendous. And at the other end of the scale the bells are recorded beautifully. This is Victor Record No. 22394-A.

ANOTHER old-time march that has recently become popularized on the dance floor is the United States Naval Academy's song, Anchors Aweigh! It is played by the U. S. Navy Band, with a men's chorus and yell, featuring a piccolo obligato. On the other side of this record, Victor No. 21296-A, the Navy Band plays another sea-goin' march entitled All Hands.

BOLERO, Victor Records Nos. 7251-A and B and 7252-A, is a most unusual piece of music and has found almost universal popularity since its recent announcement. A simple melody is carried throughout the three parts, passing, in the first, from clarinet to the oboe, then in the second part, to the trumpets, saxophones, organ, piccolo, French horn, and trombone. The violins take it over in the third part. From beginning to end a constant, unvarying tango rhythm is kept up by the percussion instruments, tympani and snare drums. In the third part this becomes almost intense, drawing a very clear visualization of a crowded Spanish tavern. Very good bass reproduction is recorded and can only be effectively reproduced by an instrument with good bass response. This work is done by the

Boston Symphony Orchestra under the leadership of Serge Koussevitsky.

Victor No. 7252-B, the opposite side of Bolero Part 3, contains a very restful symphony entitled Gymnopédie No. 1, also played by the Boston Symphony. Its effect is just the opposite of that of Bolero, being full of soft, sustained tones.

THE "Record of the Month," chosen by the board of judges which sits each month and picks the most outstanding, artistic record, this month goes to Beniamino Gigli's *L'Elisir D'Amore—Una Furtiva Lagrima* (Elixir of Love—A Furtive Tear) on one side and *La Gioconda—Cielo E Mar* (Heaven and Ocean) on the other. It is Victor Record No. 7194, and a marvelous reproduction. Gigli is a tenor of the first order, and a great favorite of opera lovers. His name, by the way, is not pronounced as it looks to the American, but Jeel'-yee.

FEDOR CHALIAPIN is considered without a peer among the musical world's bass voices. His latest recording, and one which is unusually effective in showing off the fullness of the human voice as broadcast and reproduced by a good radio receiver, is the Victor No. 7199, on one side of which is Koenemann's "When the King Went Forth to War," and on the other Rimsky-Korsakow's song, "The Prophet." Both are sung in Russian with orchestral accompaniment, and both are tremendously popular. "The Prophet" has been recorded by Chaliapin before but not since the days of the electrical system of recording. Whether it is the orchestra accompaniment, the new recording methods or both, the new record cannot be compared with the earlier one. Both the songs on this record are exceptionally well suited to Chaliapin's voice, revealing the dramatic magnifi-

cence which has taken this famous basso from a longshoreman's job on the Volga to an enviable position among the leaders of the artistic roster.

UPON hearing Estrellita, as played by Jascha Heifetz on Victor Record No. 1332, the listener is reminded of the old Don Amazo days, when Max Dolin of the NBC worked this pretty Spanish folksong into that program. It is a lilting waltz; the type that is admired by music lovers the world over; at least where occidentals are. And Heifetz plays it as only Heifetz can. On the other side of the record is *Valse Bluettes* (Air de Ballet) by Drigo. This, also, is played by Heifetz, perhaps a little more vivaciously than Estrellita, and without the dreamy sostenuto that characterizes this particular type of Spanish music.

A few words about the life of Jascha Heifetz (pronounced Yahsh-ah High-fetz) might be of interest to the music-loving radio purchaser; especially the one who is not interested in frequencies or harmonics. Heifetz was born in Lithuania in 1901 and, it is reported, began playing the violin three years later. At the tender age of seven he had completed the course at the Royal Music School in Vilna, Poland, and after studying with Professor Leopold Auer in Petrograd, was acclaimed a mature artist at the age of ten. He then toured Russia and Scandinavia and, at twelve, played in some of the leading orchestras in Berlin, Leipzig and Vienna. In 1917 the Heifetz family emigrated to the United States, where, it was reported, fame and fortune were more or less on speaking terms. Both came immediately to sixteen-year-old Jascha, in an abundance usually realized only after maturity and long and weary experience. His genius knows no bounds.

The Fine Points of Selling Radio

By HECKERT L. PARKER

Holding attention, controlling the interview, and closing the sale, being the seventh in a series of articles on retail radio salesmanship.

HOLDING a prospect's attention is a fine art which the radio salesman must acquire. The span of attention is limited, and is easily diverted, especially when a complicated device is being explained. The salesman must first adapt the speed of his talking to be just slightly faster than the speed at which the prospect's mind works. If the talk is too slow, the prospect becomes impatient and his thoughts wander off to other subjects. If the talk is too fast, the prospect will not understand it and will lose the sales points.

The experienced salesman watches for the "listening but not thinking" attitude. By asking a question about a subject somewhat remote from that under discussion, and which requires attention for an answer, he can quickly determine whether the prospect is paying attention. If he judges that the lack of attention is due to some unpleasant circumstance over which he has no control, such as a family quarrel or a difference of family opinion about the purchase of a radio or some particular model, he is justified in deferring his talk or demonstration.

People pay more attention to pleasant things and try to get away from unpleasantness. Feelings affect memory and things are remembered more easily if heard or learned among pleasant surroundings, are pleasant to contemplate, and are pleasantly presented by a pleasing salesman. Where a prospect already has a hazy inclination favorable toward a receiver, a retail firm or a salesman, a feeling of pleasantness will hasten the decision to buy, because they will pay attention to what the salesman has to say.

During a demonstration the salesman should judge by the prospect's interest whether or not to allow a particular program to finish, or even a musical number or speech to come to a close. Most radio "fans" who know more or less about what goes on inside of a receiver are interested in receiver performance when they have an opportunity to try a new set, getting an answer to their questions about a new receiver with just a few measures of music or a few words of a speech while they twist the dial. Laymen though, and especially women,

object to anyone's switching from station to station quickly, because they are interested only in the program. At times, to allow a completion of a certain musical program may consume valuable time during a sales interview, but because of the prospect's interest in that program, the program itself may often be more effective than the remainder of the sales talk and demonstration, and permit a close of the sale at once, really saving time in the end.

Prospects are always to be encouraged to handle the switches and controls of a receiver under demonstration but the time consumed with this should always be controlled by the salesman just as he controls the other parts of the interview. Men or boys are apt to become absorbed with a new receiver. They present a difficult problem to the salesman who must get on with his sales talk and sell the set—not play with it all evening. This situation can sometimes be handled by turning the receiver around and getting the male members interested in the chassis, power unit or speaker details, which offers the salesman an opportunity to get the floor again and keep control of the interview.

Keeping the Lead

A SALES interview is an important business transaction for the salesman, and like any other business it requires a manager. It can not be left to chance. The prospect may seize the first opportunity to manage the interview, and by doing most of the talking, run the salesman completely out of the picture while talking about what the prospect has in mind—which can be many things other than radio, taking up all of the time available for the interview. Some tact is required to regain control, because the salesman must be courteous in listening and answering questions to some extent. He must constantly keep in mind what he is there for and at the slightest opportunity, break in with, "Let see, what were we talking about? Oh yes, about—so and so," and get off again into his regular sales talk. It is fatal for the salesman to permit himself to be drawn into an argument of any kind with a prospect. This is especially true if politics or re-

ligion is brought up, or some subject with which the prospect is familiar. Any of these may so completely put the salesman on the defensive, or disclose so little knowledge on his part, that the prospect will unfairly become biased against, or lose confidence in the salesman's knowledge of radio or the receiver he is selling.

A demonstration permits an easy method to regain control of the sales interview, provided the salesman is posted, as he should be, on different broadcast programs available from local stations and the times they are on the air. While the prospect is monopolizing the conversation with some outside subject, the salesman glances occasionally at his watch. At a slight pause on the part of the prospect, just a few seconds or a minute before a certain program is due to start, the salesman says, "Pardon me, Mr. Smith, in the next minute station XYZ comes on the air with their Blank Blank program in which I know you will be interested. Let me get it for you, then I shall be glad to have you finish your interesting points about—blah blah" (or whatever the prospect was talking about). This assumes a little knowledge on the part of the salesman of what Mr. Smith might be interested in, and likewise assumes the salesman knows his programs as he should. By getting the prospect to stop talking and begin listening to a program, the salesman can keep the conversation on radio and not let Mr. Prospect get back on his pet topic for the remainder of the time allowed for the sales interview.

Closing the Sale

WHEN a prospect agrees to listen to a sales presentation he expects to have arguments presented and expects to be asked to purchase. Therefore no salesman should be backward about asking him to buy. Hardly one person in a hundred will deliberately say, "I'll take it" until he is definitely asked by the salesman to do so.

There is one moment during a sales talk when the mental state of the prospect will permit closing the sale easier than at other times. If that moment passes and is not used by the salesman, the sale is not lost completely. The mere

fact that the prospect had reached such a favorable mood makes him more susceptible to further argument and easier to close at another good moment.

Good closing moments are determined by one or the other of two things: First, the close can be made at a moment when the features of the receiver being described appear so desirable that, momentarily, the prospect forgets the unliked features; or, benefits of ownership are made to appear so pleasing that momentarily, the prospect forgets outside considerations such as financial shortage, etc., which up to that moment have kept the prospect from signing on the dotted line. Second, the close can be made at a moment when previous doubts about the receiver, its maker or dealer are changed to beliefs.

As the organized sales talk or canvass is designed to make selling easier and faster, attempts should be made to close the sale at the first natural point after the principal features have been stated. "Try-out" closes can be used as tests to determine the prospect's real interest and to bring out objections or reasons for not buying. Then if the prospect is still unready to close, the regular talk can be resumed.

Thus a close could be tried in the middle of part C (see synopsis of radio receiver sales talk, page 35, April RADIO) of the sales talk by a simple statement such as, "Now, Mrs. Smith, I'm sure you realize that this modern receiver will give you and your family a lot of pleasure for a number of years. The simplicity of operation which you yourself have just tried will be appreciated by your mother (or daughter). Let us deliver this radio to you today so you can start right in to enjoy it." Present the order for signature. If successful, certainly a lot of time has been saved. If not, and the prospect still hesitates, the salesman just resumes his regular talk, then again, at the end of part D, he tries another close something like, "You know, Mrs. Smith, the baseball season opens Saturday and I am sure Mr. Smith will feel happy to know that he can get the opening game right at home (or get all the plays good and clear with this new receiver). We can have it nicely installed before then. If

you will just sign here, you will have a happy family Saturday." If the prospect still hesitates, proceed with the regular talk, then at say, point H, try another close something like, "I'm sure, Mrs. Smith, you appreciate that this is just the radio you want for your home. It will look nice placed just where you have been picturing it in your mind among your own things at home. You will not regret your decision (try to put order blank and pen in her hands) to have us install it at once. When is the best time for us to deliver it to you?"

Everyone of these tryout closes weakens the prospect's resistance to the next attempt to close. Of course, it can be overdone with some types of people, but not many can or will object. In the synopsis we have suggested at least four tryout closes should be made between parts C and J, reserving the strongest arguments for closing, to be given after completion of part J. One of the most important reasons for using tryout closes is to bring out as quickly as possible, any objections or doubts which rest in the mind of the prospect. Almost invariably the prospect will voice such doubts or objection in answer to an attempted close, giving the salesman just the information he must have, in order to overcome them then, or later in the talk.

Write out several different closes and learn them. Just as the sales talk must be varied for different people, so must the type of close be varied. Review the articles on fundamental buying motives. Prepare closes which will appeal to these different motives, and, in every case, use the close you know will appeal to the buying motive which must be satisfied for a particular prospect. Rehearse the whole sales talk with different closes inserted at the proper places. Learn to become a little more animated, more enthusiastic just before introducing a closing statement or handing over the order blank and pen to the prospect.

How Score Cards Are Used

AFTER the standard sales talk or canvass is worked up, rehearsed with objection and interruption cards described in the last article, and closes described here, it has then to be proven in practice. Its weak points can be discov-

ered only by actual practical experience, using a score card similar to one illustrated here. These cards can be made on standard plain white 6 x 8-inch cards, using both sides. One card will record the score on about fifteen different prospects.

In a few minutes several cards can be made. In a few days the data secured by their use will enable any salesman to see his weaknesses, change his talk accordingly and in a short time increase his earnings 25 to 50 per cent more than is possible without using these organized methods.

The next important thing for the salesman to learn is proper conduct immediately following the signing of the order. The conversation must not come to a sudden stop. Conversation should be carried on for some time. Frequently people have a wave of doubt, "wish they hadn't done it" feeling, either immediately or soon after signing any commitment which requires spending a fair-sized sum of money. Then is the time for the salesman to insure satisfaction—make the customer pleased with his action by pointing out another entirely new feature about the receiver, or dealer service, terms, etc., which has not previously been mentioned or stated in the sales talk. Cancellations and repossessions are frequently avoided by making the purchaser feel right then that he is getting more than he bargained for. Then, as the salesman prepares to leave, help further to retain that pleasant mood in the prospect by gradually leading the conversation out of radio and into some other happy topic or entirely different business which is prospering and will leave pleasant thoughts in the mind of the purchaser.

The next lesson will discuss handling competition and the two most important things to investigate about a prospect before making an appointment for a demonstration or sales presentation.

RADIO SALES FOR 1929

An aggregate business of \$135,845,635 was reported for the year 1929, by 10,455 radio equipment dealers, who embrace about one-fourth of the dealers in the United States, according to a statement issued by the Electrical Equipment Division of the Department of Commerce in conjunction with the Radio Division of NEMA. Sales of 862,599 electric sets and 35,197 battery sets were reported. In the fourth quarter of the year 403,932 sets were sold, valued at \$59,248,585.

In 1928 sales reported by 6,569 dealers were 447,000 sets valued at \$70,877,517; in 1927 sales by 7,737 dealers were 441,000 sets valued at \$90,785,000.

Data showing the seasonal variations in the volume of business during the four quarters of 1929 are as follows: First quarter, 22.7 per cent; second quarter, 15.8 per cent; third quarter, 23.2 per cent, and fourth quarter 38.3 per cent. As 40 per cent is generally representative of the volume of business done during the final quarter of the year, last year's 38.3 per cent was almost normal.

Salesman		Territory			
Sales talk started with (Prospect's name and address)	Covered Points A to ?	Lost Attention at ?	Closed at Point ?	Remarks	

Wiring the Home for Radio

By P. S. LUCAS

Definite specifications for installation of one or more extra speakers and remote control of set.

RADIO is now so generally used as a means for entertainment in the home that no building plan can be considered complete unless it includes adequate specifications for providing the present as well as the probable future radio needs of the owner. The necessary wiring can be roughed in, while the house is being built, at very slight additional expense. When the owner wants to use the various new radio conveniences he will thank the architect whose foresight made this possible, or blame the architect whose neglect puts him to the heavy expense of installing them in the completed home.

The immediate problem is to provide means whereby any one of several speakers in various rooms throughout a home can be operated from one receiving set whose built-in speaker may also be used at will in the room in which the set is located. These meet the existent demand for one or more extra speakers in the home, each speaker to be provided with an independent volume control and means for turning the remote set on or off. Furthermore, as practical devices are developed for the remote control of tuning, each speaker will be fitted with a dial or push-buttons for tuning the set. These devices are so nearly ready for general use that the roughing in of wiring for them is also well justified.

The wiring installation is made not by a radio man, but by the electrician or electrical contractor who installs the wiring for light and power. It is he who bids on the architect's specifications,

through the general contractor, and the radio man may not even hear about the job until the owner is ready to buy his radio set and speakers. All the work must be done in accordance with the requirements of the National Electric Code, whereby the insurance companies take precautions against the possibility of fire due to defective wiring.

For the usual installation it is assumed that the radio set, as well as the speakers,

of the speaker. The other contains a radio jack for the voice coil of the speaker. This pair is shown in Fig. 1b.

In case the electrodynamic speaker is to be permanently mounted in the wall or ceiling, and not in a movable cabinet, the arrangement shown in Fig. 1c is used. Here the receptacle and jack for the speaker field winding and voice coil, respectively, are not necessary.

The actual wiring requirements for

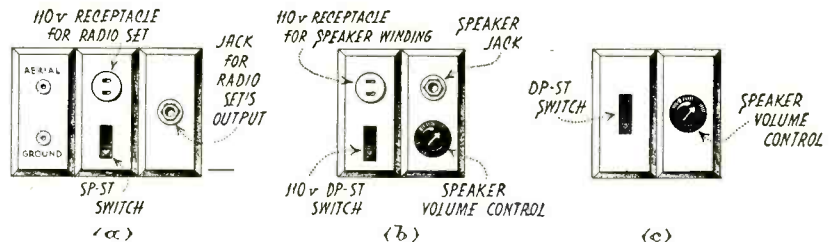


Fig. 1. Various Flushplate Arrangements for Wiring Remote Speakers

are of the cabinet or console type, connected by flexible cord to a wall plate. The wall plates at the location where the owner wants his radio set include an "antenna-ground" flush-plate, a convenience outlet with a single pole tumbler switch, and a radio jack flush-plate. This material is now standard equipment which is made by several manufacturers to fit Code outlet boxes. The general arrangement is shown in Fig. 1a.

In addition, two flush plates are needed at each point where a speaker is to be used. One is equipped with a double-pole tumbler switch and an a-c receptacle to energize the field winding

radio only for a typical home are shown in Fig. 2. The symbols, while not yet standard, are those recommended by the California Electrical Bureau to the International Association of Electricians. This plan assumes that electrodynamic speakers are used throughout. It would be somewhat simpler for magnetic speakers, and somewhat more complicated for a combination of magnetic and electro-dynamic speakers.

The electro-dynamic speaker requires two distinct circuits, one for the voice coil and the other for the field winding. The voice coil, which is a small coil of fine wire wound around the apex of the

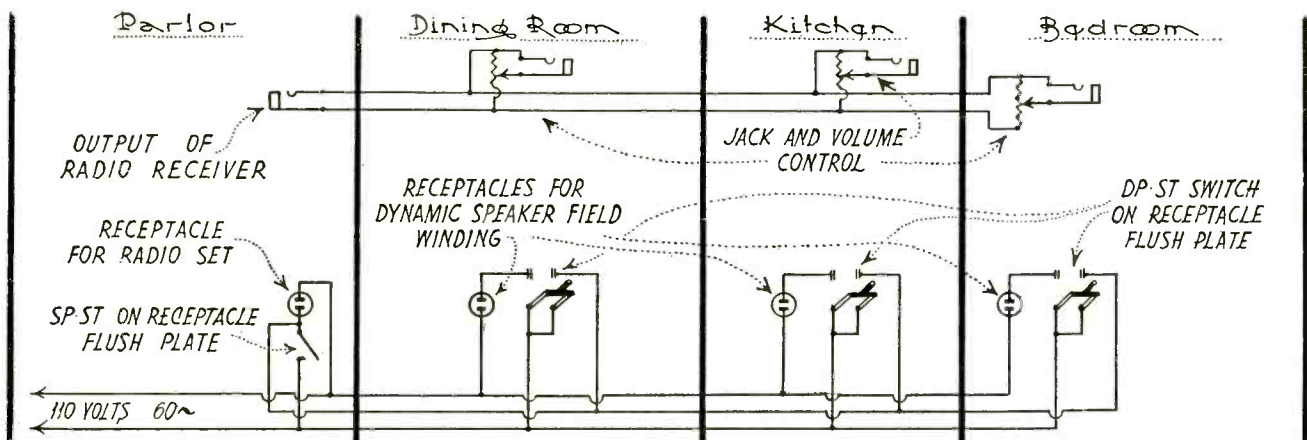


Fig. 4. Series Parallel Method of Connecting Voice Coils. This is the preferred method, but is truly effective only when 4 or 9 speakers are used.

cone, is energized by the output voltage of the power tube in the radio set, to which it is connected by the jack in the wall-plate at each speaker. The best method of connecting the several voice coils is in series-parallel, as shown in Fig. 3. This system can be handled accurately, however, only with four or nine speakers. The system shown in the upper part of Fig. 4, in which the speaker voice coils have all been paralleled, will be just as satisfactory if not too many speakers are used. If there

from the house wiring. (The rectifier is usually an integral part of the speaker, both consuming about 50 watts.) While this field winding could be, and often is, plugged into any convenience outlet, and turned off by pulling the plug or by opening a switch in one side of the cord, the plan shown in Fig. 4 is as simple as would be the wiring for any receptacle if done at the roughing-in stage. The very convenience afforded by such a system will capture the imagination of the home builder.

parlor. If music is wanted in the bedroom at the same time, that switch must be thrown. This energizes the field coil of the bedroom speaker only, as the radio set is already in operation. If all switches are closed, each one, as it is opened, merely stops reception in its own room, until the last, which opens the circuit to the radio receiver. This may be considered a semi-remote control system, true remote control allowing the listener to tune in various stations from a remote location.

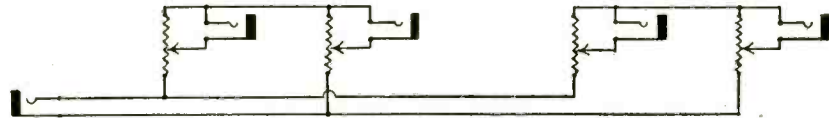


Fig. 3. Wiring Diagram for Remote Electro-Dynamic Speakers. Each D. P. Switch Controls Current to One Speaker Field Winding and to Radio Receiver.

are more than four or five speakers, it would be wise to combine the two methods, having, for example, two in one series string, and three in the other. The speaker in the radio set should not be overlooked. In any case, each speaker jack is connected to one end and the middle of an individual volume control resistor, the two ends of which are connected to the wires from the radio set.

The field-winding is a large coil mounted over the heavy iron core of the speaker. This is energized by a rectified alternating current which is supplied

Double pole switches are required for each of the remote locations, these being available with a standard receptacle on a single flush-plate. The switch on the radio set is left turned on, a single pole switch on the plate that holds the receptacle for the radio being used when it is desired to turn on the set in its own room, which is, say, the parlor. When the remote switch in the dining room is thrown on, the circuit is closed through its own receptacle, hence through the electro-dynamic field coil, as well as through the radio set's receptacle in the

It will be noted that there are five wires between each speaker and the radio set. Three of them are a-c in a three-wire circuit with switches which control the current to the speaker field coils and to the radio set. As these three wires must carry from 75 to 200 watts for the set and about 50 watts for each speaker, no more than eight speakers should be placed on the conventional 600 watt circuit as specified in the Code for wire size and type of installation. Whether they are run in conduit, armored cable, or knob-and-tube depends upon local regulations.

The two wires for the voice coil connection are an entirely separate and distinct shielded circuit of No. 14 Code wire. The shielding is necessary to prevent pick-up of hum from a-c wiring. The requirement is met by specifying one of several standard brands of shielded wire.

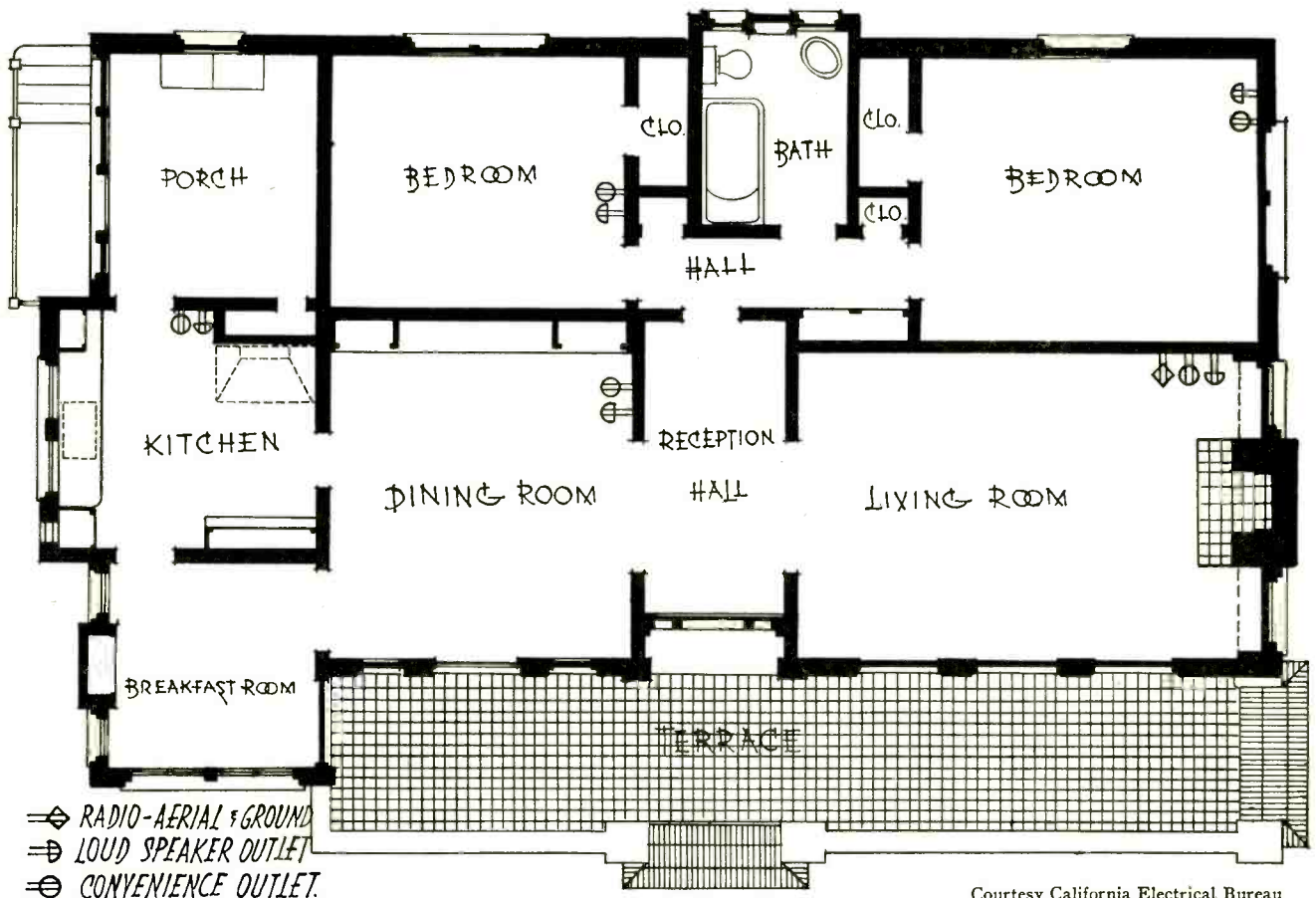


Fig. 2. Model Floor Plan Showing Radio Outlets Only

Courtesy California Electrical Bureau

REMOTE control of tuning is now so nearly perfected that the wise owner will want provision made for this convenience. Some of the systems, such as the Kolster, employ a few relays and a reversible a-c motor for tuning a certain number of predetermined stations at the push of a button. For eight possible predetermined stations the Kolster system requires a twelve-wire cable between the set and each remote control point. Details as to the wiring requirements of several other systems which are under development, are not yet available.

One of the most valuable of the newer developments resides in the possible application of the Selsyn motor which was developed in the government laboratories for controlling battleship turrets and various operations at the Panama Canal. Permission to manufacture it for a commercial market was recently given to the General Electric Company, and it is quite likely that it will be applied to remote control of radio tuning.

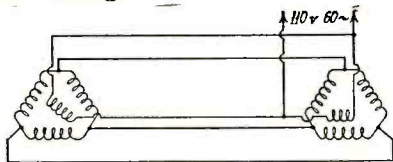


Fig. 5. Schematic Diagram of Two Selsyn Motors

Two motors and an interconnecting five-wire cable are required for a single unit. One motor is attached to the shaft of the gang condenser, and one to the shaft of the remote tuning dial. The motors are so constructed and connected that any rotary movement of one is immediately duplicated by the other. A revolution of say ten degrees by the dial motor is instantly followed by a revolution of ten degrees by the condenser motor. With a single motor to revolve the condenser, as many auxiliary motors as desired may be connected in the five-wire circuit. As the motors could be made in small fractional horsepower sizes for this service, the current-carrying capacity of the cable would be very small.

The field coil of each Selsyn motor consists of three equal windings, the three terminals between windings being connected to the three corresponding terminals in the second motor, no external connections being made to the field. The rotor or armature carries a coil energized by 110 volts a-c and is connected in parallel to the rotor of the second motor. When the armature of one motor is turned with the hand that of the second follows, tracking perfectly. If the two are held apart by the hands, they immediately spring back together when released. The circuit for a pair of these motors is shown in Fig. 5.

This information is of more use at the present time to the architect than to the radio man, for the latter can only cash

in on it when it arrives, while the architect may win his client's everlasting gratitude by preparing for what will probably be the most revolutionary thing in radio since the advent of a-c receivers. How? By specifying an extra conduit line to every loudspeaker outlet and possibly to the basement or attic in case the 1931 or '32 radio set be removed from its fancy "package" and put on a shelf above or below decks.

NOTES FOR THE RADIO INSTALLER

1. Connect output leads for electro-dynamic speakers across secondary of output transformer, or otherwise be sure they are isolated from power tube plate supply.
2. Connect output leads for magnetic speakers across output transformer primary or in the power tube plate lead.
3. Electro-dynamic volume control shunt resistors should be of 30 ohms or thereabouts; those for magnetics should be of from 5,000 to 15,000 ohms.
4. An external volume control akin to those in the remote locations must be connected across the speaker voice coil in the radio set and brought out to a convenient place so that it will be possible to have the volume in the parlor lower than that in the bedroom or kitchen.
5. One output transformer, located at the receiver, should serve all speakers, all individual input transformers being removed. This rule should govern the owner's choice of speakers.

ANOTHER problem for the architect in making his plans for a home is the mounting of these extra speakers. Magnetics, of course, may be hung on a hook, but electro-dynamics are as heavy and bulky as an electric motor. Furthermore, for good reproduction, the electro-dynamic speaker requires, first, what is called a "baffle," or a wide area of solid material separating the front of the electro-dynamic cone from the rear; and second, an opening in the rear to give the sound waves a chance to escape. The wall would make an ideal baffle, but the mechanism of the speaker is too deep to fit in the usual 4 in. compartment. If the rear end could project into a closet the situation would be nicely solved.

The plans suggested above, in which receptacles are employed, are intended for the cabinet type of speaker. If the speaker unit is mounted in the wall, the receptacle called for is unnecessary, the switch shown being connected direct to the speaker field coil instead. In a single story house or in the upper story of a two-story house where the attic is immediately overhead, the ceiling makes a good place for the speaker. In either case, a few small holes about 1 in. in diameter should be bored a few inches

away from the large hole, in order to relieve the back pressure and its resultant muffling of the sound. A framed piece of patterned silk will serve to hide the mechanism and holes.

THE job of wiring in the antenna and ground system is pretty well understood by most architects and electricians. Both lead-ins should be well insulated from all parts of the building, of course, knob and tube insulation sufficing, and measures should be taken against allowing moisture to follow the antenna lead through the wall. This is usually done by making a drip loop in the wire just before it enters the house and by slanting the first tube insulator upwards as it enters the wall.

Specifications for Speaker Extension Outlets

WIRE—SPEAKER EXTENSION (Speaker Field Circuit).—N. E. Code Standard.

WIRE—SPEAKER EXTENSION (Voice Coil Circuit).—No. 14 pair in metallic sheath. National Electric Code Standard.

INSULATION—SPEAKER EXTENSION (Wiring).—Conduit, armored cable or knob and tube, according to local regulations. Materials, N. E. Code Standard.

OUTPUT JACK (at Radio Receiver).—Bryant No. 2912 or similar.

VOLUME CONTROL PLATE (with Outlet Jack).—Carter No. 630 or similar.

RECEIVER SWITCH.—G. E. No. 2736 or similar.

SWITCHES, REMOTE (with Receptacle).—Hart & Hegeman No. 8998 or similar.

SWITCHES, REMOTE (without Receptacle).—Hubbell No. 8802 or similar.

OUTLET BOXES.—Standard steel, N. E. Code, 3 gang and 2 gang, as required. A metal partition shall be placed between sections of a ganged box so as to separate the power wires from the signal or radio wires.

PLATES.—Brass (or Bakelite). Finish to conform to finish of building hardware in the same room.

Specifications for Antenna and Ground for One Receiver

WIRE—ANTENNA LEAD-IN.—No. 14 RC N. E. Code Standard.

WIRE—GROUND CONNECTION.—No. 14 RC N. E. Code Standard.

INSULATION—ANTENNA LEAD-IN.—Materials, N. E. Code Standard. For knob and tube construction shall be the same as for light wires and separated not less than 2 ft. where the antenna lead-in parallels any wires carrying 60 cycle alternating current. For conduit construction, insulation and installation same as for light wire.

INSULATION—GROUND WIRE.—Same as for the antenna lead-in. Ground wire may be common to more than one outlet. Lower end to be connected to water pipe system, by a substantial ground clamp, attached to pipe at a point on the street side of the water meter, or to an independent ground.

ANTENNA—GROUND OUTLET.—Standard N. E. Code steel box. Yaxley combination receptacle No. 136 or equal. If this receptacle is in the same ganged box with wires carrying light or power current, a metal partition shall separate the two systems in the outlet box.

PLATE.—Brass or Bakelite. Finish to conform to finish of building hardware in the same room.

Learn People's *Hobbies*; It *Opens the Way to Sales*

By J. EDWARD TUFFT

"THERE is no more sure way of winning a man over than learning in advance what his hobby is and then being able to talk at least reasonably well on that hobby—at least well enough to start him to talking!" This is the statement of E. W. LeRoy, proprietor of the LeRoy Radio Electric Company at Alhambra, California.

"There is no man so hard boiled," says Mr. LeRoy, "that he is not approachable through some angle and if there is a way of learning in advance the thing in which he is most interested there is no better plan than to learn in advance what that thing is.

"I know a millionaire to whom I sell a new radio every year or so, and I first got the inside track with him by learning that his hobby was raising rabbits. I talk rabbits when I am with that man, or at least I say enough so that he talks rabbits.

"The way to a man's heart is through his hobbies!"

"I know another man whose hobby is dairy cattle. I know enough about dairy cattle to start him off. It so happened that as a boy I helped my father conduct a milk distributing business. Coming from Wisconsin I naturally knew something of such subjects. I have sold that man considerable merchandise because I have reached his heart through his hobby. He is wealthy and buys a radio every few years, paying the difference between the old model and the new. I never would have sold him ten cents worth of merchandise if I had not let him talk on his hobby the first time I went to see him.

"I know a man whose hobby is automobiles. The first time I sold him a radio I took him to the display floor in Los Angeles. I had a speedy little car and whisked him into Los Angeles much more quickly than he ever had been able to make it with any of his large high-priced cars. I talked automobile all the way in, or rather talked just enough—just enough to start him. Then the action of my car pleased him. He bought a radio, partly because of the friendly feeling my hitting on his hobby wrought.

"I know another man whose hobby is playing cards for small stakes (strange hobby!). He will play for three hours

and not lose or gain sixty cents and yet be intensely interested in the game. When I wished to sell him a radio, his name having come to me as a prospect, I engaged him in conversation on his hobby and finally accepted an invitation to his house to play a light game of cards with him and another friend. We played for two hours and then he took us down town to a three-dollar dinner. He could scarcely wait for the dessert to come along so anxious was he to get home and finish that game. I won his affections and sold him a radio. He has been a constant customer of mine since. The ice was so thoroughly broken that nothing stood between us and now there is no formality needed in an approach.

"I can not explain the psychology of a hobby, but I do know that a man's hobby is actually closer to his heart in many cases than his regular occupation. There are many wealthy people in this locality who have made their money in certain lines of business and yet it is much more simple to reach their hearts through interest in their hobbies than it is through interest in their lines of business.

"In addition to men's hobbies I try to keep a good mental lineup on the good customer's eccentricities, especially his leading eccentricity. By promoting the ends of that eccentricity a dealer can cement a friendship that means sales. An example of this is a very wealthy customer of mine who has a mania for making his wife think he is a shrewd bargainer. He wants her to think that he has bought every article of merchandise a little cheaper than anyone else could buy such article. This may not be an admirable eccentricity but he has it and I cannot change it, therefore I utilize it.

"The other day he bought a radio set from me, about the fourth set he has purchased. I went to his home to complete the deal. The set had a definite price and we never cut prices. That is one thing we do not do. I believe the figure was four hundred ninety-eight dollars. When the man's wife was in hearing he said in a very businesslike voice, 'As I understand it I am getting this set for three hundred ninety-eight dollars?' The wife had known that four

hundred ninety-eight dollars was the price. I could have started an argument and said, 'No. We have the same price which we make to all!' I did nothing of the kind. I did not reply at all but went ahead and completed the preliminaries. The man made out a check for the regular price, four hundred ninety-eight dollars.

"I suppose to this day that man's wife labors under the impression that her husband is a supreme bargain driver. I would do nothing to disturb his pride in himself or the pride in her for him that he hoped to build up. That is an eccentricity of years' standing, ridiculous to be sure, an eccentricity that no man should cultivate, but since it is there and I can not change it I let the old fellow have his fun and I make the sales.

"I could tell of many other eccentricities of this kind that I do not feel called upon to disturb. Sufficient to say they are just as prevalent among the real rich as among the less wealthy, possibly they are more prevalent. The fact that a man is a millionaire does not mean that he has nothing funny in his makeup. It may mean just the opposite.

"We sell radios and other electrical goods to many extremely rich people. I must say that the observance of these little things—catering to the hobby, not criss-crossing on the eccentricity—these two little things have helped wonderfully in putting the LeRoy Radio Electric Company on the map in Alhambra. In this connection it must be remembered always that a sale is a personal thing. When a sale is made two personalities meet and the exchange of merchandise for money is the result of such meeting if a sale is made. The good salesman will study his prospect, learn his vulnerable point and utilize the best method of approach; he will learn his sore spot, his eccentricity, and will not cross him there.

"The way to the heart is not through the stomach as someone has said. The way to the heart is through the hobby. It must be remembered also that the pocketbook is always hanging around in the vicinity of the heart so if you get to the heart you have gotten to the pocketbook. Win the heart and you can make sales."

Six Essentials for Success With Credit

Have You Sufficient Capital? The Importance of a Good Supervision Routine—Credit Salesmanship—Other Essentials, as Viewed by an Expert.

By JOHN T. BARTLETT

RADIO dealers can reduce their credits and collections to a science, bringing results which are forecasted with exactness. No feature of the radio business should be viewed with less uncertainty. Six essentials of scientific use of the credit principle begin with what, at first sight, seems to bear no relation to credit-granting. This is *adequate capital*.

What the capital needs of a retail radio business, in respect to its purchases, will be over the yearly period, can be estimated. Next, the radio dealer should decide the amount of capital which he safely can permit to accumulate in receivables. In arriving at this figure, he should be conservative, so that always he is safe, even though unforeseen conditions should arise to delay payments by customers.

A formula, put forward by Prof. E. R. A. Seligman, for computing capital requirements, is: $(N+1) \div 2K$. This gives the ratio of average outstanding total amount of installment credit granted. N represents number of months taken on the average to complete installment payments; K number of months in year, the period for which volume of installment paper can be estimated by the radio dealer in arriving at a computation of capital needs.

The amount of capital used to finance radio store accounts receivable should be such that the dealer still will be able to take any discounts which may be offered him, and to aggressively merchandise to his community with a complete stock.

If capital is limited, the radio dealer can do one or more of three things. He can use financing services offered by manufacturers and by finance companies, in whole or in part for his business. He can put it down as a principle, however, that his profit possibilities are considerably reduced if he must use financing company's service. His standing with a local bank may be such that necessary arrangement can be made whereby financing is obtained through it, with a saving. Another course in the situation is to restrict the amount of credit extended, by raising the average down payment and shortening the payment period. The effectiveness of capital used can be stimulated by increasing the rapidity with which collections are made.

Care in Opening Accounts

THERE is a maxim among credit men to this effect — an account well opened is half collected. Care in opening accounts is number two in our list of essentials.

Here, the important thing is to be sure you have sufficient information concerning the man who asks for credit, or for additional credit. Don't assume you have it because you consider you know your community well. Talk with the applicant. Learn who he is—what property he owns, what his crop and feeding prospects are, and so on. Check the man up through your local credit bureau, if there is any doubt in the situation. The cost of membership in any good credit bureau is returned to the member many times in the course of months.

Don't take chances in extending credit. If you have complete information, good judgment will tell you when to reject, and when to take on. While the percentage of rejected applications varies a good deal, 20% is a very high figure, 3% rather low.

The Supervision System

THE third essential is a comprehensive credit supervision plan. How collections are watched should not be a matter of haphazard. Instead, there should be a regular routine for examining accounts at intervals, and for giving attention to those found to require it. A special article in this series will explain supervision plans in detail.

Collection skill is our fourth essential. Ability to "get in the money" may be so high that, extending credit, one radio dealer is able to do several times as much credit business as his competitors.

What is collection skill? Those who possess it declare that it consists of 90% in a relentless and vigilant determination to obtain the payment. Mere persistence is itself so important, in fact, that many merchants whose collection skill is principally limited to it make splendid collection showings. However, there is a cleverness which can be practiced in collections which assists a great deal. A special article in this series will discuss credit and collection salesmanship.

Making Credit Productive

THIS writer offers as the fifth essential a sane attitude toward credit in the radio trade. If credit is handled right, it is, above all things, a productive device.

Credit customers remain customers longer; they do not haggle over price as do cash customers; their average purchase is greater.

Grant credit freely, when you have adequate capital to finance accounts receivable, if *you are sure you will get your money*.

For others, require ample security, or say, "No."

Don't hesitate to switch good cash customers to the credit list, when their credit standing is A-1. When you know you have mastered credit granting, go out systematically and increase the number of your credit customers.

Psychology in Credits

THE sixth essential is one which, heretofore, has not commonly been included in the fundamentals of successful credit-granting; but, assuredly, it deserves a place there. It is *credit salesmanship*.

The reference is to psychological skill of various kinds which the efficient radio dealer uses in handling his credits and collections. For example:

An application for credit is made by a party who is unknown. Facts must be learned about him. Now, pushing interrogations in an aggressive way, the dealer may readily offend the applicant, who decides he doesn't want to deal with the merchant anyway, and goes away aggrieved. Before this situation, many dealers realizing they are not tactful—do not have credit salesmanship—will refrain from asking questions which are essential. They take a chance one way or another; either refuse credit, and possibly make an error, or extend it, and possibly make an error.

The merchant who is a salesman in credit matters will get the information he wants, in a pleasant way which does not embarrass. He will obtain much information in indirect ways. During the course of a conversation which the applicant does not realize is to give the

radio dealer facts, one point and then another comes out.

Yes, there is a salesmanship here. There is salesmanship again as accounts become past due.

It is literally true that credit grantors by the scores of thousands hesitate to remind customers of delinquency fearing that they will cause offense and lose good will and patronage.

On the other hand, credit salesmen are found here and there who realize that a customer can be reminded of non-payment without impairing the goodwill situation in the least. These men have no hesitancy at all about calling attention to delinquency.

Their words are tactful, and their manners pleasant. They are true salesmen.

There is a salesmanship which good collectors demonstrate every now and then, persuading reluctant debtors to make payment.

The radio dealer who gives close attention to salesmanship and these other five essentials will arrive at a mastery

of the science—for such the writer insists it should be called—of extending productive credit to the public.

WHAT IS YOUR "CREDIT" RATING WITH THE BANK, AS A RADIO DEALER

CREDIT," the word that keeps us awake at night, that we dream of, and seemingly our very existence depends on. What we could do with it; and what we can't do—without it.

With all our troubles of selling, servicing, advertising, collecting, and what have you, "credit" will invariably pop up as the final factor. If we have it we sit on top of the world, if we don't it's just too bad.

Credit, according to the dictionary, is "trust reposed." But how much trust is reposed in you, Mr. Dealer, by the bank? It would be well to find out, even though you have two thousand dollars' worth of radio all paid for standing on the floor and no creditors. You may have been doing business for years, and

never really needed ready cash to meet an emergency. Therefore, you have found it unnecessary to ask for credit of your bank.

Mr. Dealer, it will be well worth your time to go to your banker and get the surprise of your life. When you say to him you wish to secure a loan of five hundred or a thousand dollars, prepare yourself, brother, with all the figures your organization can bring to bear, and make sure the assets are about four or five to one over the liabilities. Mr. Banker evidently has been bitten once too often, and therefore has decided that all radio merchants are technicians and not merchants after all.

Radio in its present state seems to be well stabilized in our minds; however, it will be interesting to know when our little industry is going to be put on the same level so far as credit is concerned as other lines of merchandise.

So, Mr. Dealer, it's up to you to put it on a sound foundation by good business methods, and we will be given one-half the credit we think we should have.

AN IRONCLAD AND HOLEPROOF CONTRACT

This model form of sales contract is recommended by the Pacific Radio Trade Association

Original and Other Copies of Contracts to be Written in Ink or Indelible Pencil

ORIGINAL SALES CONTRACT

TO **RADIO CORP.**
(DEALER)
Street..... City....., State.....
Date..... 193.....
Model No..... Serial No.....
Description of Article.....

I acknowledge delivery to me of the above described article for which I agree to pay to you, your successors or assigns the sum of (\$.....)
Less Allowance (\$.....)
Cash Price if Paid Within 60 Days..... (\$.....)
Insurance and Interest..... (\$.....)
Contract Price..... (\$.....)
Initial Payment..... (\$.....)
Balance Due..... (\$.....)
(\$.....) on the..... day of each consecutive month hereafter, beginning....., 193.....

until the full amount including interest is paid. It is agreed that the title and ownership of said property is to remain in you, your successors and assigns, until the full price including interest, collection charges, if any, and all charges for repairs, supplies and parts on said property, up to the time this contract terminates, are fully paid; and that thereupon the title and ownership is to pass to me. Time is of the essence of this contract.

Should I fail to make any of the monthly payments, as above specified the entire balance plus interest will become immediately due and payable, and I agree at your election to make such payment or return the said property to you, on demand and without legal process, you to retain for use and depreciation all payments made by me; and I am further obligated to pay to you all installments that have become due at the date of repossession.

If suit be brought to recover any or all of the goods or chattels, or to collect any balance due, I agree to pay a reasonable attorney's fee, in said action, together with costs of suit incurred.

That abandonment of said property or any part thereof, or removal to any place whatsoever, without your written consent shall constitute a breach of this agreement. I agree to take good care of said property and to be responsible for its loss by theft, fire or other casualty and not to remove it from my residence.....

City..... State.....

There are no warranties or guaranties of any character except such as are contained in this contract. This contract is not assignable, unless your consent in writing is first had and obtained. I will pay all municipal, county or State taxes and assessments, on said property.

It is further agreed, that the within contract, is not subject to any collateral agreement, or secret arrangement made with the salesman obtaining the same; and that no other agreement, oral or written, express or implied shall limit or qualify the terms of this contract unless made part of the original contract on file in vendor's office.

Signed.....
Res. Phone.....
Bus. Phone.....
Salesman.....

ASSIGNMENT BY THE DEALER

Dealer's Address.....
Date..... 193.....
For value received, the undersigned hereby sells, assigns and transfers to.....

its successors or assigns, all right, title and interest in and to this agreement, the amounts, payable thereunder and the property therein described.

The undersigned warrants that this agreement was executed in connection with the sale and delivery to and the acceptance by the buyer named therein, of the article therein described, and that there is now owing thereon the amount as set forth therein, and that the account is not subject to dispute, offset or counter-claims.

.....RADIO CORP.
Signed..... (Seal)
By..... (Authorized Officers)

Witness.....
Print Name in Full.....
Husband's Name.....
Occupation.....
Employed by.....
Employer's Address.....
Department.....

REFERENCES

Name.....
Address.....
Name.....
Address.....
Name.....
Address.....

REMARKS

Class of Device.....
Maker.....

Profit in Sale of Short-Wave Radios

By ARTHUR HOBART

A practical account of what and how short-wave broadcasts may be heard with factory-built receivers.

THE sale of short-wave receivers offers a profitable opportunity for many radio dealers. Public interest in direct short-wave reception has recently been stimulated by rebroadcasts of foreign programs. The dormant desire for distance, which is only partly satisfied by the reception of long-wave stations, is still felt by many listeners. And, most important of all, a number of good short-wave factory-built receivers are now available.

Enough short-wave programs can be heard to insure good entertainment during almost any hour of the day or night. Excellent music can be heard direct from Germany, France, Spain and Russia. A native of any of these countries or a student of their languages will be particularly interested in the talks that are frequently given. Many of the announcements are given in several languages so that the identity and location of the station can be readily determined.

Every dealer has on his list the names of a number of dyed-in-the-wool radio fans who can be interested in the superior long distance reception obtainable with short-wave transmission. Not only can much greater distance actually be heard but also the signal is much farther above the noise level than in the regular broadcast band. Thus the music from WGY on 379 meters may be lost in the noisy background but clearly heard on 32 meters, although the actual background is about the same.

Most of the short-wave broadcasts come from stations which are also transmitting the same programs on long waves for local listeners. Thus W2XAF at Schenectady broadcasts on 9530 kc (31.48 meters) WGY's nightly pro-



Silver-Marshall Bearcat, M. 737
4-tube (2 screen-grid) a-c regenerative with built-in power supply

grams except on Sunday, Wednesday and Friday, when they may be heard on 15,040 kc (19.56 meters) from W2XAD at Schenectady. Likewise KDKA's programs from Pittsburgh can be heard from W8XK on 11,880 kc (25.25 meters) and also on 4800 kc (62.5 meters). W9XF broadcasts WENR programs on 6020 kc (49.83 meters), W8XAL broadcasts WLW programs on 6,060 kc (49.5 meters), W6XN broadcasts KGO programs on 12,850 kc (23.33 meters), W2XE broadcasts WABC programs 6120 kc (49.02 meters) 17 hours daily, and W3XAL broadcasts WJZ programs on 6100 kc (49.18 meters). Recent schedules of these broadcasts are given in the accompanying table of reliable short-wave stations.

As all of these stations operate under experimental licenses and most of them are authorized to transmit on other frequencies, the most satisfactory method of reception is to locate the several broadcast bands on the tuning dial and then tune for the desired station in the band. Having spotted these American stations it is then easier to tune for the more distant foreign ones.

There are six of these short-wave broadcast bands, each of which can be located in the condenser dial by using the proper plug-in coil. The first band consists of ten 15 kc channels between 6000 and 6150 kc (49 to 50 meters). The second has five 20 kc channels between 9500 and 9600 kc (about 31 meters). The third has seven 30 kc channels between 11,695 and 19,905 kc (about 25 meters). The fourth has eight 30 kc channels between 15,115 and 15,355 kc (about 19 meters). The fifth has one 40 kc channel at 17,780 kc (16.8 meters). The

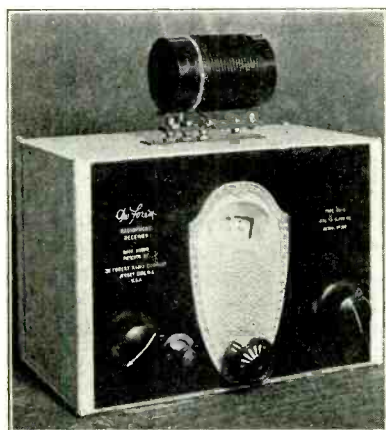
sixth has three 40 kc channels, 21,440 and 21,560 kc (about 14 meters).

In addition several stations operate on channels assigned to general experimental purposes, notably KGO on 12,850 kc, as well as innumerable amateur stations with phone transmitters. Any American station which is heard on other channels generally proves to be a harmonic of one of the frequencies in the band from 550 to 1500 kc.

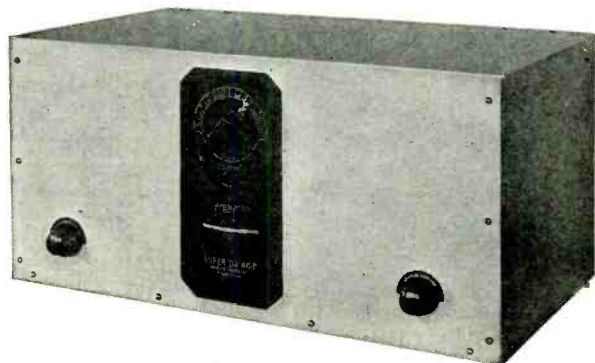
In the 49 meter band WENR, WLW, WJZ and WABC could be heard during the past winter through their corresponding short-wave stations with more or less regularity nightly. In the same band also are VORZ of Vienna on 6075 kc at noon and 5 p. m. daily, E. S. T., Motala, Sweden on 6012 kc at 1 p. m., E. S. T., and the Eiffel Tower, Paris, on 6122 kc for fifteen minute periods after 7:30 a. m., and 2:15 and 7:15 p. m., E. S. T. daily.

The most dependable station on the 31-meter band is W2XAF from Schenectady. In this band also may be heard PCJ of Philips Radio, Eindhoven, Holland on 9554 kc (31.4 meters), and 7LO of Nairobi, British East Africa, on the same wavelength. Danish, Berlin and Swiss stations are also operating in this band and near it, at 35 meters is RA97 of Khabarovsk, Russia, whose announcements are given in Russian, Chinese and English. The best Russian reception during the early morning hours is from RFM on 70.1 meters.

The 25-meter band may be identified by means of W8XK of KDKA on 11,880 kc (25.25 meters). CJRX of Winnipeg, Canada, broadcasting CJRX programs is also a uniform performer on 25.6 meters. Having located the approximate position it is then possible to tune in G5SW of Chelmsford, England on 25.53 meters daily from 2 to 7 p. m., E. S. T., except Saturday and Sunday



De Forest Short-Wave Receiver
4-tube Regenerative, battery operated



Norden-Hauck Super DX-5
6-tube with one Pentode a-c and d-c model

SOME DEPENDABLE AMERICAN SHORT-WAVE BROADCAST STATIONS

- W8XK (KDKA)**, 4800 kc (62.5 m.) and 11,814 kc (25.4 m.); 20,000 w., 6:00 p. m. to midnight daily, E. S. T.; operated by Westinghouse E. & M. Co. at East Pittsburgh, Pa.
- W9XF (WENR)**, 6020 kc (49.83 m.); 5000 w., 6:00 p. m. till midnight daily; operated by Great Lakes Broadcasting Co., Chicago, Ill.
- W2XAL (WLW)**, 6060 kc (49.5 m.); 250 w., 6:00 p. m. to 2:00 a. m. daily, E. S. T., except Sat. and Sun., when stops at midnight; operated by Crosley Radio Corp. at Cincinnati, Ohio.
- W3XAL (WJZ)**, 6100 kc (48.18 m.); 20,000 watts; operated by R. C. A. Communications, Inc., at Bound Brook, N. J.
- W2XE (WABC)**, 6120 kc (49.02 m.); 500 watts (to be increased to 20,000 watts); 8:00 a. m. to 1:00 a. m. daily, E. S. T.; operated by Columbia Broadcasting System at Cross Haddock Bay, L. I.
- W2XAF (WGY)**, 9530 kc (31.48 m.); 40,000 w., 6:00-7:00 a. m. daily, E. S. T., evening programs same as WGY on Mon., Tues., Thurs., Sat.; operated by General Electric Co. at Schenectady.
- W6XN (KGO)**, 12,850 kc (23.33 m.); 10,000 w., temporarily discontinued after May 17; operated by General Electric Co. at Oakland, Calif.
- W2XAD (WGY)**, 15,340 kc (19.56 m.); 25,000 w.; WGY evening schedule except Tues. and Thurs., when noon to 5:00 p. m., as also on Sat.; operated by General Electric Co. at Schenectady.

and also hear 2LO. Oporto, Portugal, may also be heard in this band slightly below KGO's frequency.

The outstanding performance on the 20-meter band is W2XAD on 15,340 kc (19.56 meters) whose 25,000-watt transmitter gives a wallop that is heard round the world. Rather close to this band at 13,400 kc (22.38 meters) may be heard the transatlantic phone messages from WND at Deal Beach, N. J., during the night hours and at 18,340 or 21,060 kc (16.36 or 14.24 meters) dur-

ing the daylight hours. Daily news and weather reports may also be heard from Nancy, France, on 19,754 kc (15.5 meters).

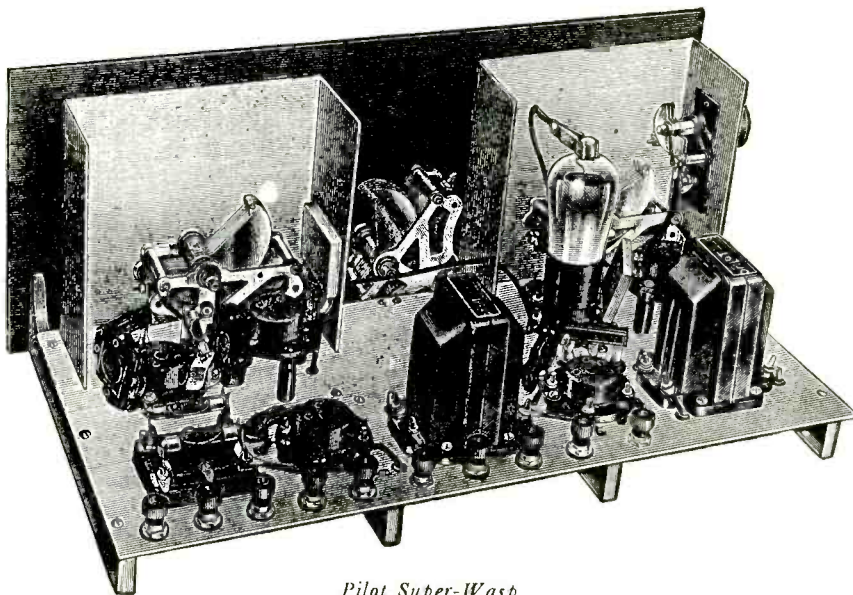
One of the observed peculiarities of radio is that the range of a station is greater during the night than during the day and during the winter than during the summer. Furthermore the greater the frequency, up to about 13,500 kc (about 22 meters), the greater the range of the station. Frequencies above this value are propagated at such high altitudes that full sunlight is necessary to give a sufficient degree of ionization to bring them back to earth. Consequently they are most effective for daylight reception.

THAT the tuning of a short-wave set is a critical operation which calls for the utmost patience cannot be disguised. For demonstration purposes in the store, a number of stations can be readily spotted on the dial, but any buyer should be cautioned that his results at home will depend largely upon his own patience and skill.

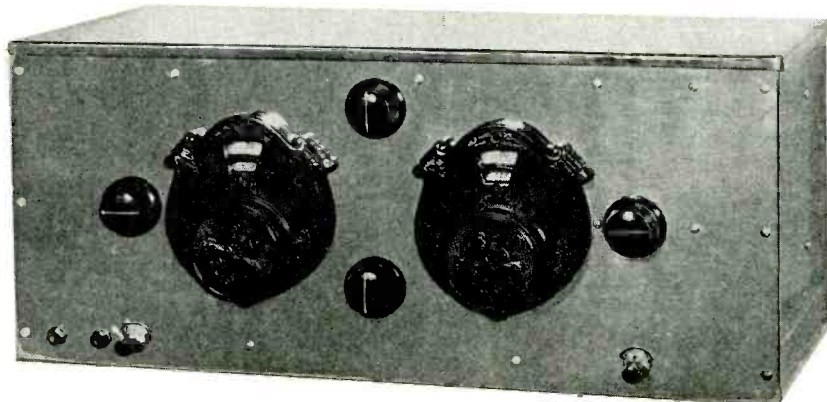
The reason for the criticalness in tuning is the tremendous range of frequencies which are crowded on the dial.

SOME FOREIGN SHORT- WAVE BROADCAST STATIONS

- Eiffel Tower, Paris**, 6122 kc (49 m.), 7:30-7:45 a. m., 2:15-2:30 p. m., 7:15-7:45 p. m. G. M. T. daily.
- Koenigswursterhausen, Berlin**, 9410 kc (31.88 m.), 11:30 a. m.-2:30 p. m., 3:00-10:00 p. m. G. M. T.
- PCJ**, 9550 kc (31.4 m.), 27,000 w., Thurs. 1:00 to 3:00 and 6:00 to 10:00 p. m. G. M. T., Friday same except till 1:00 a. m., operated by Philips Radio, Eindhoven, Holland.
- 2ME**, 10,410 kc (28.8 m.), Sydney, Australia, about 4:00 a. m. E. S. T.
- CJRX**, 11,720 kc (25.6 m.), 2000 w., 5:30-8:30 p. m. daily except Sun., when 11:30 a. m. to 1:30 p. m. and 10:00 to 11:00 p. m. (Tues. and Thurs. till 10:30 p. m. and Sat. till midnight), operated by James Richardson & Sons, Ltd., at Winnipeg, Canada.
- G5SW**, 11,750 kc (25.53 m.), 15,000 w., 2:00 to 7:00 p. m. daily except Sat. and Sun., G. M. T. Operated by British Broadcasting Co. at Chelmsford, England.
- FW4**, 12,240 kc (25.5 m.), 6:00-8:00 a. m. G. M. T. daily. Ste. Assize, France.
- Nancy, France**, 19,754 kc (15.5 m.), news and weather reports 5:00 p. m. G. M. T. daily.
- PMB**, Bandoeng, Java, 15 m.



Pilot Super-Wasp
4-tube (1 screen-grid) a-c regenerative receiver



Sargent Long-Distance De Luxe
11-tube Superheterodyne with static reducer; battery operation

Whereas there are ninety-six 10 kc channels in the regular broadcast spectrum between 550 and 1500 kc, there are 1850 similar channels in the short-wave spectrum between 1500 and 20,000 kc (200 to 15 meters). Even with the conventional set of four plug-in coils, there is an average of nearly five times as many channels to be covered by the same dial revolution that covers the broadcast spectrum. Even with wider channels which are allocated to short-waves, the tuning is much more difficult.

Furthermore there are wide gaps
(Continued on Page 91)

WHO'S TO BE 1930'S RADIO STAR?

EVERY so often a single manufacturer of radio emerges from the fog of competition and takes his permanent place in the sun.

Meanwhile, dozens of others flash brilliantly before the trade, then drop, extinguished, into oblivion overnight.

Look at the magnificent record of these brilliant stars—Atwater Kent—Majestic—Philco.

Then see what is back of them. Each has had a record of success in manufacture and merchandising in similar or allied lines.

Who's to be 1930's bright particular star? Clarion?

It is reasonable to think so, because quality and price are the principal factors which determine the success or failure of any product. Clarion radio is outstanding merchandise offering more value in appearance, workmanship, and performance than any other receiver on the market—a set that meets every requirement and excels all competition. Clarion will sell readily, stay sold, pay a good profit and build good will.

It is reasonable to think so, too, because TCA, the makers of Clarion, have had an experience and record of success equalled by few in the radio industry. For years TCA have fabricated the essential parts for radio receivers put out by America's leading set manufacturers and have taken a very active part in solving the engineering problems presented by every successful receiver. We have been through all the rapid developments of past seasons—have expert knowledge

of all the reasons for the successes or failures of manufacturers and the causes of service troubles. With all this experience and background we have no illusions on what the public will accept or reject.

We have perhaps the most modern radio plant in the world, equipped with the latest automatic machinery. Clarion is not an "assembled" job. We fabricate from the raw material, finish, assemble, and test every part that goes into *Clarion* from the smallest metal stamping to the complete electro-dynamic speaker—at one profit and one overhead.

This remarkable set-up enables us to produce Clarion Radio to sell for \$109.00—when others costing twice as much do not offer equal performance or appearance, and still assure a good profit to us, to the jobber, and to the dealer.

TCA's liberal but sane advertising plan will meet the approval of every radio merchant, and the TCA Commercial Credit Trust Finance Plan assures dealers of prompt and satisfactory handling of deferred payments on Clarion Radio.

Read the center pages of this announcement—examine the illustrations—study the specifications—and judge for yourself whether or not you agree that Clarion will be the bright star of radio for the coming season.

Distributors and dealers are invited to write for details. We will be happy to have you inspect Clarion Radio either at our factory or at the R. M. A. Shows at Atlantic City and San Francisco.

TRANSFORMER CORPORATION OF AMERICA, 2309 SO. KEELER AVENUE, CHICAGO

Licensed under R. C. A. and Associated Company Patents; Member R. M. A.

Clarion

THE GREATEST RADIO VALUE AT ANY PRICE

Tell them you saw it in RADIO

A Clarion Franchise means financial success

Every distributor and dealer—especially those who have been the victims of “dumped” merchandise, mid-season price cuts, and excessive servicing costs—is looking for a radio receiver this year that will assure substantial profits to him and complete satisfaction to his customers.

Among the leading distributors who believe in Clarion Radio and have signed up with us for 1930 are:

Wakem & Whipple <i>Chicago, Illinois</i>	Stern & Co., <i>Boston, Mass.</i>	Front Company <i>Wheeling, W. Va.</i>
E. M. Wilson & Son <i>Newark, N. J.</i>	Boetticher & Kellogg <i>Evansville, Indiana</i>	Standard Supply Co. <i>Portsmouth, Ohio</i>
Stern & Co. <i>Hartford, Conn.</i>	Bihl Brothers, <i>Buffalo, N. Y.</i>	Repass Automobile Co. <i>Waterloo, Iowa</i>
Roberts Auto & Radio Supply Co. <i>Philadelphia, Penna.</i>	Patterson Parts Co. <i>Cincinnati, Ohio</i>	Dakota Electric Supply Company <i>Fargo, N. D.</i>
McIntyre & Burrall Company <i>Green Bay, Wisconsin</i>	Rockefeller Accessory House <i>Sunbury, Penna.</i>	Stratton & Terstegge Co. <i>Louisville, Ky.</i>

Musical Products Distributing Co., New York City, N. Y.

These key distributors are seasoned radio men—they know the success that has followed the selection of a winning set. They have visited our factory, met the men in our organization—studied our financial set-up—and after a most thorough and searching investigation have tied their future up with ours. This should be proof to you that a TCA franchise means a credit balance in the bank.

Read the center pages of this announcement again . . . examine the illustrations—and then if you're satisfied, as we are, that Clarion Radio will be the shining star of this season . . . write or send the coupon for full information.

TRANSFORMER CORPORATION OF AMERICA, 2309 S. KEELER AVE., CHICAGO

At the R. M. A. Show, Atlantic City, visit the Clarion Theatre, (Sound-proof Booth No. 32A) and Display Booth Sec. B-48-49

Headquarters and demonstrating rooms, Ritz-Carlton Hotel

Clarion

THE GREATEST RADIO VALUE AT ANY PRICE

New Radio Models

NEW OFFERINGS

from the

R·M·A SHOW



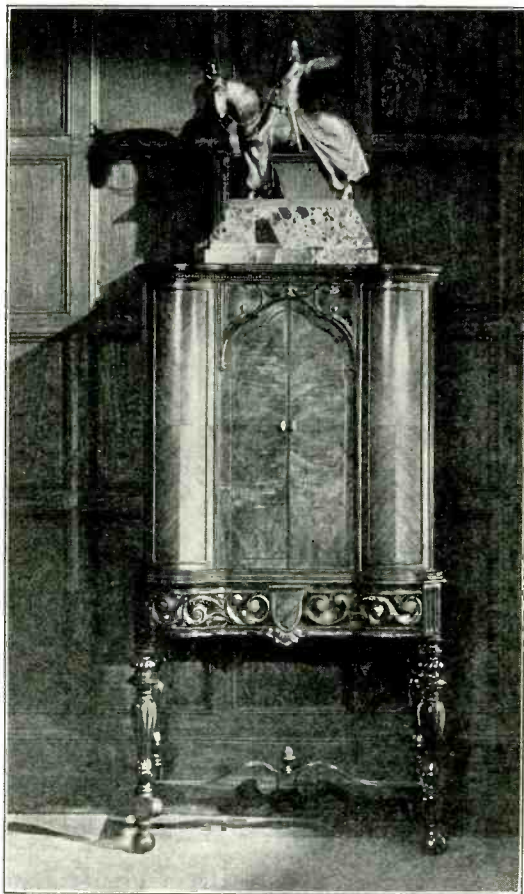
SOME of the largest manufacturers in the radio industry have deemed it wise, for various reasons, not to divulge information on their new models until they are actually presented at the show. Because this issue of "RADIO" was put to press on May 20, it was not possible to show the illustrations of various new models, such as Atwater Kent, Crosley, Majestic, Radiola, Sparton, Victor, Graybar, General Electric Company, Westinghouse, Grebe, and others. These new models will be illustrated and described in the July issue of "RADIO," which will be the SHOW REPORT NUMBER and will contain a section similar to that which here follows, showing, next month, the pictures of new models not ready when this issue went to press.

THE PUBLISHERS.

SEASON OF 1930-1931

New Radio Models

American Bosch Magneto Corp.



Bosch Console 60-E

Three '24 screen grid tubes in r-f stages, one '24 in detector, a '27 first audio tube, two '45s in power stage, type '80 rectifier. 60 series has a fifth '24 screen grid tube as automatic volume control.

Special Features: Five tuned circuits with two tuned and one untuned r-f stages; sponge rubber mounting; adjustable tone control; "line-o-lite" tuning; automatic volume control (in the 60 series).

Models: 58 (60 cycle) and 59 (25 cycle) in A and B cabinets; 58-A is a lowboy with side panels of matched veneers and shield shaped grill listing at \$144.50 in the East; 58-B is a highboy with sliding doors, listing at \$159.50. The 60 series has the D and E cabinets; the 60-D is a highboy with tall sliding doors listing at \$195 in the East; the 60-E is an Italian Renaissance highboy with Florentine carving on the apron and bowed side panels of quarter matched walnut. It lists in the East at \$250. Model 62-C is a d-c receiver in a lowboy console listing at \$159.

SEASON OF 1930-1931

New Radio Models

F. A. D. Andrea



Fada Model 42

Three screen-grid r-f stages; a '27 acting as a two-element detector with another as a detector-amplifier; resistance coupled first audio stage with a '27; push-pull power stage with two '45s; type '80 rectifier.

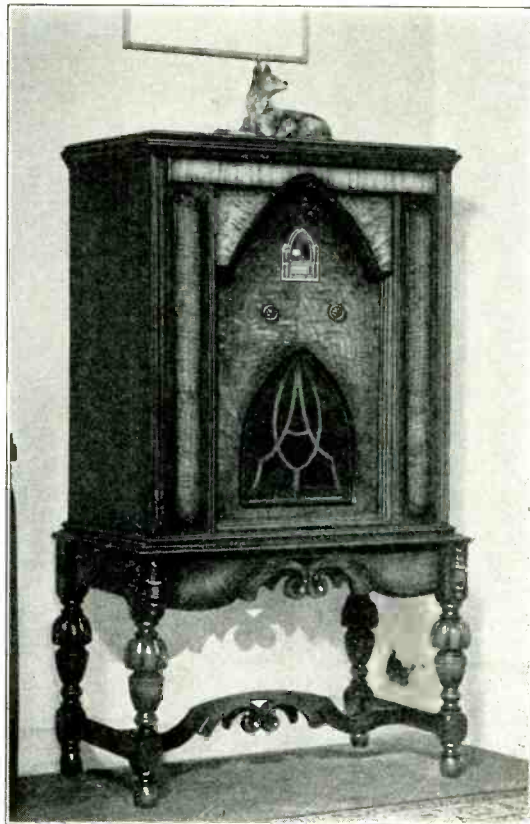
Special Features: "Flashograph" dial window or lighted call letters of favorite stations; automatic volume control, in addition to manual control; pre-selector tuning; tone character control for reducing high frequencies, either to minimize static or to emphasize bass notes.

Models: Model 42—An open faced lowboy cabinet, priced in the East at \$159. Model 44—A de luxe lowboy with stretcher and sliding doors; Eastern price \$188. Model 46—A de luxe highboy with carved pilasters and quarter French doors; Eastern price \$228. Model 41—A de luxe four-legged highboy of the French Renaissance period, priced in the East at \$218. Model 47—A de luxe walnut cabinet of the Italian Renaissance style, housing an electric phonograph combination; Eastern price \$328. Chasses are the same in all models.

SEASON OF 1930-1931

New Radio Models

Audiola Radio Company



Audiola Model 80

Screen grid tubes in three r-f stages, '27 detector, push-pull audio stage with two '45s, type '80 rectifier.

Models: No. 70 is a Gothic lowboy with cathedral grill and cathedral escutcheon, listing in the East for \$107. It stands 40½ high. The Model 80 is a highboy, also of Gothic style, standing 44½ in. and listing at \$119.

SEASON OF 1930-1931

New Radio Models

Nathaniel Baldwin, Inc.



The Baldwinette Model 50

Two '24 screen-grid r-f amplifier stages, one '24 screen-grid power detector, a single '45 audio frequency stage in the Model 50 and a '27 and a pair of '45s in the Model 70, type 80 rectifier.

The Baldwinette Model 50 is a mantle type receiver measuring $18\frac{1}{2}$ in. high and $15\frac{3}{4}$ in. wide, having a 9-inch electro-dynamic speaker; the Consolette Model 70 is a lowboy employing the same chassis except for the fact that two a-f stages are used, with two '45s in the second. A $12\frac{1}{2}$ -inch speaker is used in the latter. Both receivers may be had with remote control if desired. The Model 50 is priced at \$99.50 and \$129.50 with remote control; the Model 70 lists at \$129.50 or at \$159.50 with remote control. When remote control is specified model numbers 51 and 71 are used.

SEASON OF 1930-1931

New Radio Models

Browning-Drake



Browning-Drake Model 70

60 Series: Two '24s and two '27s in the four r-f stages, a '24 detector, '27 first audio, pair of '45s in the push-pull second audio stage, and an '80 rectifier. **70 Series:** Three '24s in the three r-f stages, and detector, '27 automatic volume control and first a-f stage, pair of '45s in push-pull in the last stage and an '80 rectifier.

Special Features: The 70 Series boasts of automatic call letter tuning, equalized band-pass filter, automatic volume control to eliminate fading, power detection and remote control in models 70 and 71 if desired.

Models: Model 69 is the only console in the 60 Series. American walnut cabinet, Eastern price, \$129.50. Model 70 is a low-boy without doors, standing 36 in. high. Eastern price, \$159.50. The 71 is a high-boy, 43 in. high, furnished with French doors, and listing in the East at \$192.50. When equipped with remote control, the 70 and 71 become the 70-R and the 71-R, listing, respectively, at \$229.50 and \$262.50. Model 72 will be a combination, ready for distribution in July.

SEASON OF 1930-1931

New Radio Models

Brunswick



Brunswick Model 15 Lowboy

Three '24s in the r-f stages and one detector, two paralleled '45s in the single a-f stage, and an '80 rectifier tube.

Special Features: Concentric tuning and volume controls, power detection, easy access to all parts of the shielded chassis.

Models: Present models S-14 and S-21, new Model 15 lowboy with sloping front corner panels and no doors, and the new Model 22 high-boy with French doors and new design of fluted corner panels.

SEASON OF 1930-1931

New Radio Models

Bush & Lane Piano Co.



Bush & Lane Model 75

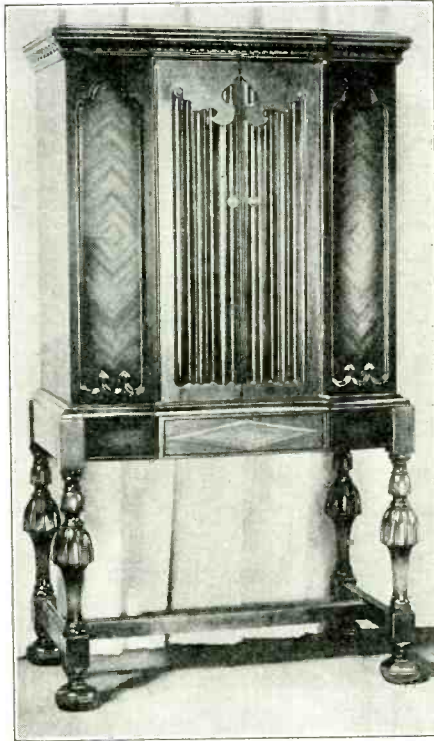
Three '24 screen grid tubes in the three r-f stages, '27s in the detector and first a-f stage, two '45s in push-pull in the power stage and a type '80 rectifier.

Models: Model 55 in oak or walnut finish without doors, listing in the East at \$142.50; Model 75 lowboy, listing at \$159.50.

SEASON OF 1930-1931

New Radio Models

Thomas A. Edison, Inc., Light-O-Matic



Edison Light-O-Matic Model R-7

R-6 and R-7; three '24s in r-f amplifier, '27 detector, first and second resistance coupled audio stages, two '45s in push-pull in third a-f stage and type '80 rectifier.

Special Features: Pre-selection, two-element linear detector, Light-O-Matic tuning, automatic volume control, variable tone control.

Models: The R-6 and R-7 are the two new screen grid models, both highboys of walnut with doors carved in linfold design. While the panels of the R-6 are also in linfold design, those of the R-7 are quarter-matched. The latter lists in the East for \$268; the former for \$297.

Last year's models, the R-4, R-5 and C-4 Phonograph Combination are being continued. These are non-screen grid models and list in the East at \$223, \$177 and \$336 respectively.

SEASON OF 1930-1931

New Radio Models

Colonial Radio Corporation—Series 33



Colonial No. 33 Windsor

Three '24s in r-f stages, '27 detector, pair of '45s in push-pull power stage, type '80 rectifier.

Special features: Provision for Cutting Fully Automatic Remote Control, Cutting dynamic speaker in 14-watt field, pre-selection, large safety factor.

Models: The Princess; lowboy of sliced and oriental striped walnut, with simulated floral design inlay on front, listing at \$129.50. The Mayflower; highboy in sliced, oriental striped and American striped walnut with antique bronze grill, listing at \$139.50. The Windsor: of sliced oriental and American striped walnut with choice matched butt walnut doors, art frieze over doors and carved pendants along the sides. Floral inlay on apron, legs fluted and tapered. Price, \$149.50.

SEASON OF 1930-1931

New Radio Models

Electrical Research Laboratories, Erla



Erla Model 36

Four '24 screen grid tubes in the four r-f stages, '27 detector, two '45s in push-pull in the a-f amplifier stage, type '80 rectifier.

Models: Model 34 is a lowboy listing in the East at \$130; Model 36 is a highboy with French doors and quarter-matched panels, listing at \$160 in the East; Model 38 is a radio-phonograph combination carrying an eastern list of \$230. Automatic volume control may be had in all models for \$10 additional.

SEASON OF 1930-1931

New Radio Models

Excello Products Corporation



Excello Model 172 With Doors Open

Three screen grid radio frequency stages, '27 detector and first a-f amplifier, push-pull '45s in second a-f stage, type '80 rectifier.

Models: R-155, Eastern List, \$170; R-168, \$180; R-170, \$200; R-161, \$230; R-171 phonograph combination, \$230; R-154 phonograph combination, \$260.

SEASON OF 1930-1931

New Radio Models

General Motors



The Hepplewhite Lowboy

Three r-f stages with screen-grid tubes; power detector and resistance coupled first audio using '27 type tubes; push-pull power stage with a pair of '45s; type '80 rectifier.

Special Features: Variable tone control by which bass or treble may be emphasized at will, with visual indication of tone control setting; strip type station selector scale giving complete visibility of entire broadcast range; ball bearing support of variable condenser gang for smooth operation; triple brace system of chassis construction; individual shielding for the variable condensers. For technical information and circuit diagram refer to Serviceman's Monthly Supplement.

Models: The Hepplewhite Lowboy, the Sheraton, the Late Italian, the Queen Anne and the Georgian. The Queen Anne and the Georgian models are equipped for electric phonograph reproduction. Prices range from \$136 to \$172 for the radio models and \$198 and \$270 for the radio-phonograph types, without tubes. The same chassis is used in all models.

SEASON OF 1930-1931

New Radio Models

Gilfillan Bros., Inc.



Gilfillan Model 105

Three '24 screen-grid r-f amplifier stages, screen-grid power detector, single resistance coupled stage of audio amplification with '45, type '80 rectifier.

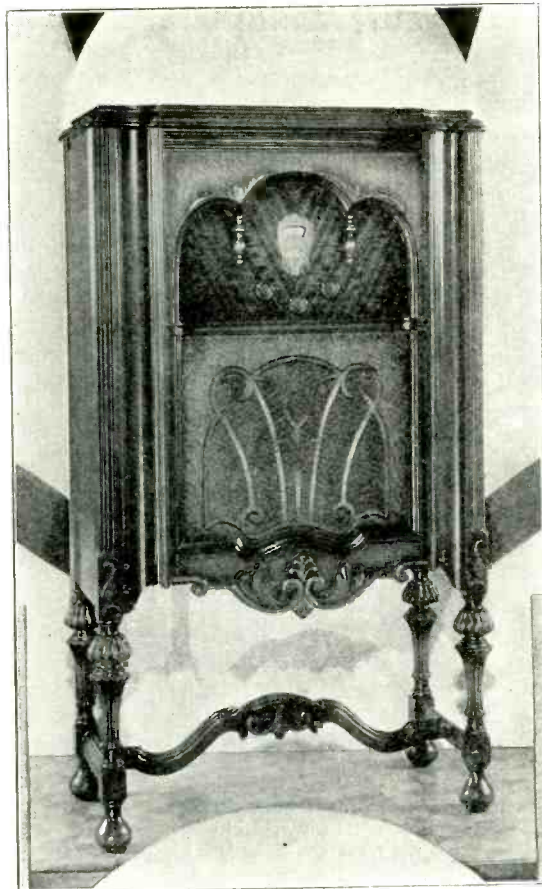
Special Features: Five tuned circuits; pre-selector tuning; variable tone control for emphasizing bass or treble frequencies; detector regeneration switch for increasing sensitivity; resistance network for balancing out hum; capacitive coupling at high radio frequency end of dial, inductive coupling at low radio frequency end for equal amplification over entire scale.

Models: 105, lowboy with walnut finish, fluted and turned legs, no doors, Western price, \$99.50; Eastern, \$109.50. Model 106, semi-highboy with doors. Carved legs, burlled walnut panels and overlays. Priced in the West at \$132.50, and in the East at \$145.

SEASON OF 1930-1931

New Radio Models

Gulbransen



Gulbransen Champion, Model 161

Three '24 screen grid tubes in the r-f stages, '27 detector and first a-f stage, pair of '45s in push-pull in the power stage, type '80 rectifier.

Special Features: Variable tone control, 100 per cent overload safety factor in power pack, Stadium Type electro-dynamic speaker.

Models: No. 161 Champion, 48 in. high, of rare woods with genuine carving, priced in the East at \$130.

SEASON OF 1930-1931

New Radio Models

Howard Radio Company



Howard "Plymouth"

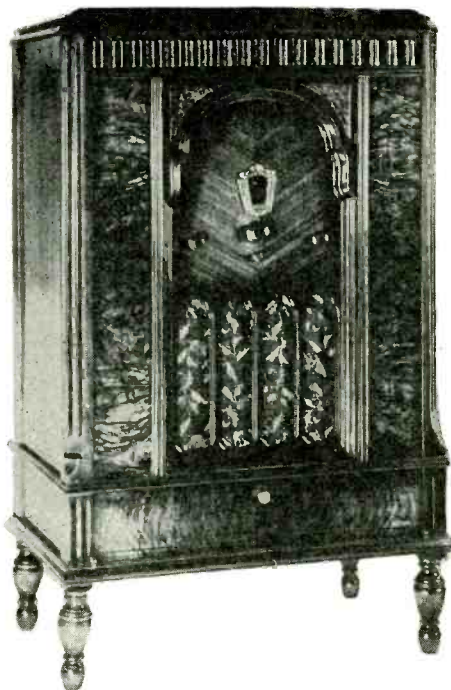
Three '24 screen grid tubes in radio frequency amplifier, '27 detector, two '45s in push-pull audio stage, type '80 rectifier.

Models: Plymouth, a lowboy without doors, selling for \$165 in the East; the Consolette, a highboy without doors, selling for \$185; the Puritan, \$210; Hepplewhite, \$245; Florentine, \$275; Gothic, \$275. Prices on the West Coast are \$10.00 higher.

SEASON OF 1930-1931

New Radio Models

Philadelphia Storage Battery Company—Philco



Philco Radio-Phonograph Model 296

Screen Grid Plus Line: Three '24s in r-f stages, '27s in detector, detector-amplifier, and first a-f stage, two '45s in power stage, '80 rectifier.

Special Features: Screen Grid Plus Line; five tuned circuits, Multiplex detector system with two element detector, automatic volume control, four-place tone control, station recording dial.

Models: Screen Grid Plus Line; Model 96 Highboy, in cabinet of matched American butt walnut, listing in the East for \$145. Radio phonograph model 296, listing for \$198, cabinet of American black walnut, matched butt walnut and Oriental wood. Seven tube line; Lowboy Model 77, open-faced cabinet, \$110. Console Model 77, compact cabinet with built-in speaker, butt walnut and bird's-eye maple, \$95. D-C and battery operated sets also available. All receivers equipped with tone control.

SEASON OF 1930-1931

New Radio Models

Colin B. Kennedy



Kennedy Highboy

Special Features: "Selectone" tone control for regulating bass and treble accentuation; carved and turned legs; curved side panels of warmly toned woods.

SEASON OF 1930-1931

New Radio Models

United Air Cleaners Corporation—Sentinel



Sentinel Model 12, Radio Phonograph Combination

Models 10, 11, 12: '24s in two r-f stages and detector, '27 first a-f stage, two '45s in push-pull power stage, type '80 rectifier.

Special features: Pre-selection, voltage regulator tube, linear power detector, resistance coupled first audio stage.

Models: Model 10, modernistic design of burl and butt walnut, with panels of zebra wood in three tone effects, tapestry of deep rust and gold in center panel. Eastern list, \$127.50. Model 11 is similar but has center doors, and lists in the East at \$135.00. Model 12 is a radio phonograph combination without doors, in similar modernistic design, listing at \$180.00.

SEASON OF 1930-1931

New Radio Models

Silver-Marshall



Silver-Marshall "Queen Anne-7"

Type 34 chassis: '24 screen grid tubes in the two r-f stages and detector, '27 first a-f stage, two '45s in push-pull in output stage, '80 rectifier. Type 35: Screen grid tubes in three r-f stages and detector, pair of '27s in push-pull in first audio stage, pair of '45s in push-pull second stage, type '80 rectifier.

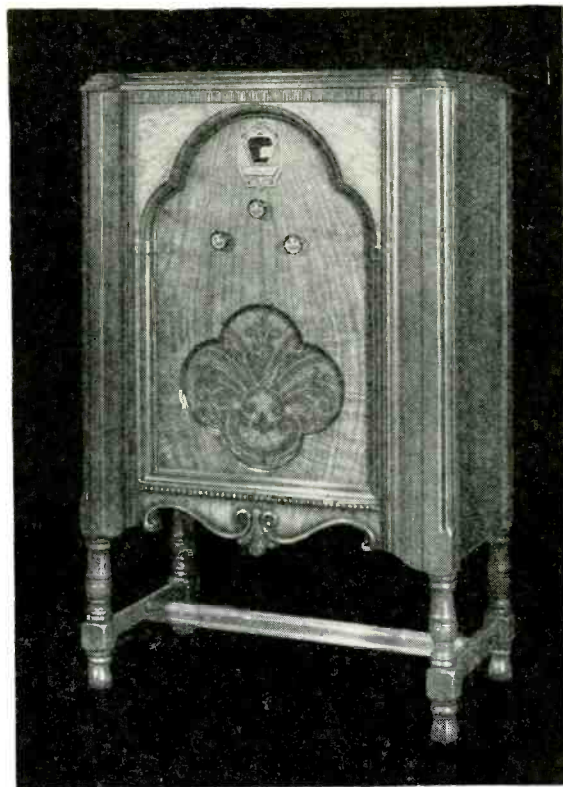
Special Features: Pre-selection, variable tone control, automatic remote control at additional cost of \$50.00.

Models: The Princess, \$135, employs the 34 chassis; lowboy with center-matched butt walnut top, Australian laurel front center piece and African mahogany side panels. The Queen Anne-7, \$160, front panel and overlays of Carpathian Ash, hand-carved walnut legs. Queen Anne-9, identical with the smaller Queen Anne, but larger, \$185 list. The Elizabethan, \$225, walnut with linenfold overlay panels. Eastern and western prices are the same.

SEASON OF 1930-1931

New Radio Models

Transformer Corporation of America "Clarion"



Clarion AC-51

Three screen-grid r-f stages, power detector with a '27, resistance coupled first audio with a '27, push-pull power stage using two '45s, '80 type rectifier.

Special Features: Twelve-inch Clarion electro-dynamic speaker; oversize power units; triple-pi filter for reducing a-c hum to minimum; separate power pack; automatic line voltage control.

Models: The AC-51 is a lowboy priced in the East at \$109; the AC-53 incorporates the same chassis in a highboy cabinet and lists at \$129 in the East; the AC-55 is a radio-phonograph combination employing the same radio chassis and listing in the East for \$199. All prices are less tubes.

SEASON OF 1930-1931

New Radio Models

Stewart-Warner



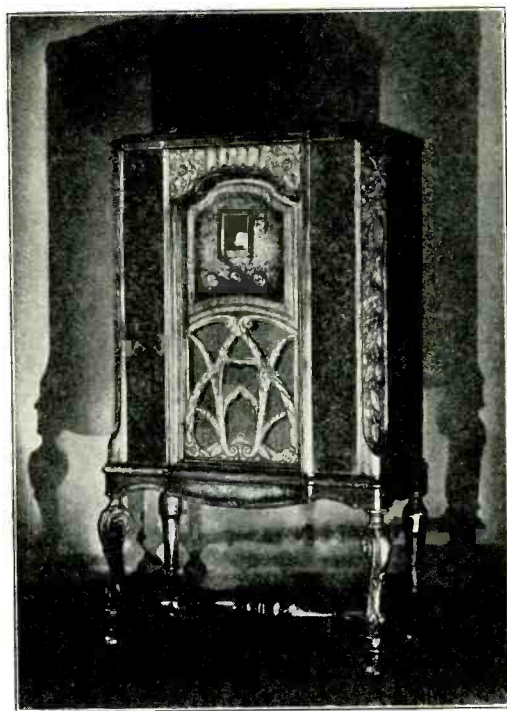
The Stewart-Warner "Raphael"

Models: New Series 100 Line; The Raphael, Italian Renaissance period cabinet, American walnut contrasted with overlays of redwood burl, listed at \$162.50 A-C or D-C and \$144 for battery operation. The St. James, Elizabethan Highboy, with sliding doors, listing at \$197.50 for A-C or D-C, and \$179 for battery model. The Graham, of American and Oriental walnut, without doors, legs fluted and turned; priced at \$137.50 and \$119 for battery operation. The Avon, an effort to conserve space, 40 in. high, of American walnut and embossed bronze escutcheon. This model employs the Series 950 chassis and is priced at \$99.75 for A-C or D-C operation and \$81.25 for battery use.

SEASON OF 1930-1931

New Radio Models

Story & Clark Radio Corporation



Story & Clark Model 43

Type '24 tubes in the three r-f stages, '27 detector, two '45s in push-pull in the single a-f stage, type '80 rectifier.

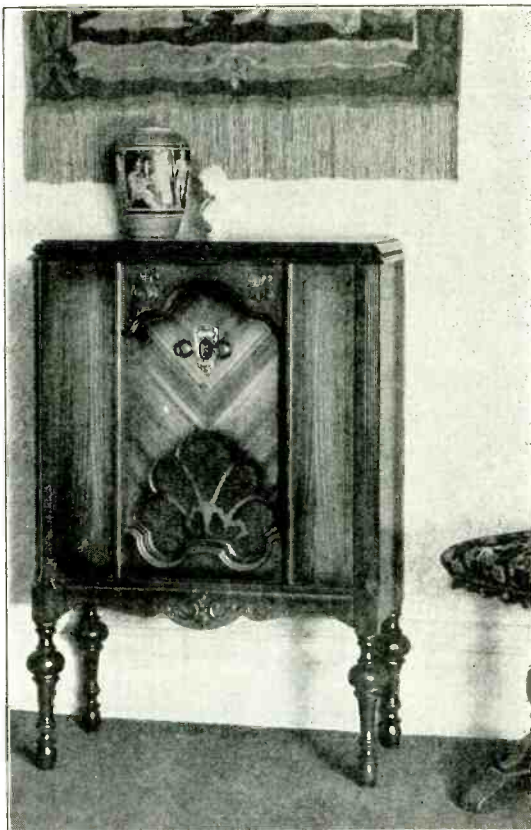
Special features: Tone control, heavy copper shielding, automatic volume control in two higher priced models, easy accessibility.

Models: Model 36 is a lowboy with heavy, fluted legs, carved panel and grill and ornamental side panels, listing at \$208.00. The 43 is a semi-highboy with carved legs, grill and side panels. Price, \$248.00. The Model 50 is a console with French doors, listing at \$287.00.

SEASON OF 1930-1931

New Radio Models

United States Apex



Apex Model 11

Model 10: Two '24s in the r-f stages, '27 detector and first a-f stage, pair of '45s in second stage, '80 rectifier. Model 11: Three '24s, '27 detector and first a-f, two '45s, type '80 rectifier. Models 54 and 55: Two '24s in r-f stages, '26 detector, '01-A and '71-A audio stages, (battery operated).

Models: Model 10, low-boy, V-striped matched panel, Monks cloth grille, \$101 east of the Rockies. Model 11, lowboy, satin finish, toned and highlighted. Eastern list \$130. Model 54, highboy, battery operated, \$95. Model 55, table model in brown toned metallic cabinet, \$58. All prices complete with tubes.

SEASON OF 1930-1931

New Radio Models

Victoreen Superheterodyne



Victoreen Lowboy

Four '24 screen grid tubes in the single r-f stage and three intermediate frequency stages, '27s in the first and second detectors, oscillator and first a-f stage, a '50 in the second audio stage, two '81s as rectifiers, two 874 voltage regulators and a '01-A for grid bias rectifier.

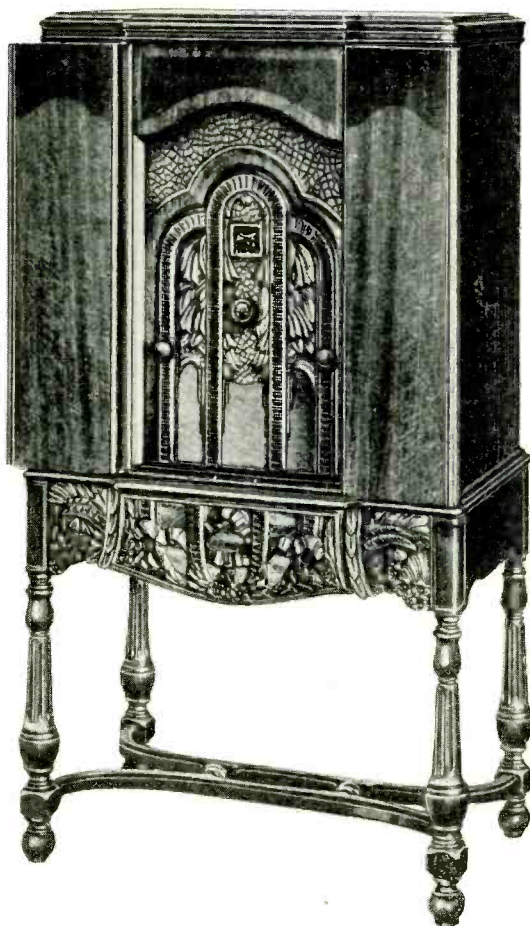
Special Features: Cast aluminum chassis shields, constant potential on all plate circuits, single dial control of both tuning and oscillator circuits.

Models: A lowboy listing at \$345, highboy with walnut overlays and hand-carvings, \$395, and a combination either in antique oak finish at \$595 or selected walnut at \$645.

SEASON OF 1930-1931

New Radio Models

Stromberg-Carlson



Stromberg-Carlson No. 11, Convertible Console

Models 10 and 11: Four '24 screen-grid tubes in three r-f stages and detector, two '45s in audio stage, type '80 rectifier. Models 652-654: three '24s in r-f, '27 detector, '45 audio stage, '80 rectifier. Model 846: three '24s in r-f, '27 detector, first audio and automatic volume control, two '45s in second a-f, '80 rectifier and speaker rectifier. Models 641-2 use same tube package as 652; Model 645 same as 846 without rectifier tubes.

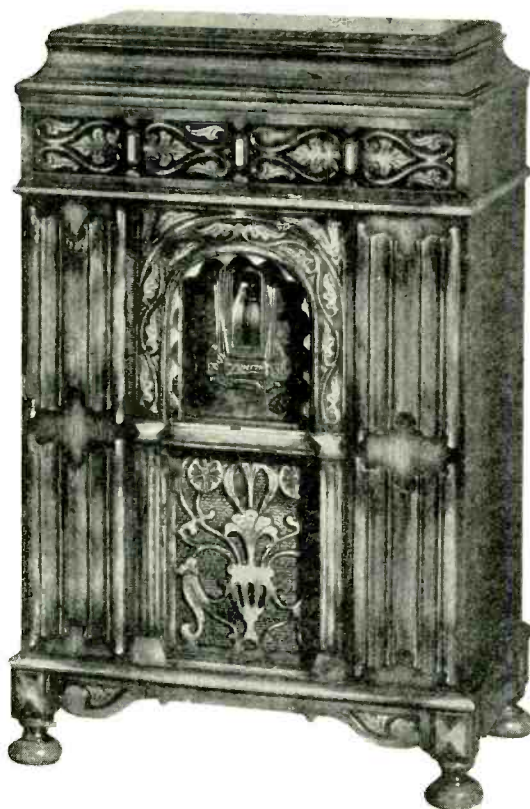
Special features: Bi-resonator circuits for uniform selectivity, balanced push-pull amplifier stage, direct and semi-indirect sound projection from speaker, large speaker baffle.

Models: The new models are Nos. 10 and 11, the former being a low console of walnut with center panel of classical Karvart pattern, graceful side pilasters and turned legs, listing in the East at \$259.00. No. 11 is a convertible console, to which a phonograph motor and turntable may be added at will. Cabinet of walnut with Karvart friezes and striped and rippled finish. Eastern list, \$285.00.

SEASON OF 1930-1931

New Radio Models

Zenith—70 Series



The Zenith 75 Phonograph Combination

Three '24 screen grid tubes in the two r-f stages and detector, a '27 first a-f stage, two '27s in push-pull in the second a-f stage, a pair of '45s in the push-pull power stage, type '80 rectifier.

Special Features: 72 and 73, automatic tuning, 74, remote control, 75, automatic record changer, same chassis used in all models, with double push-pull a-f amplification and five tuned circuits.

Models: No. 71, lowboy, listing at \$185, full length carved doors. Model 72, lowboy without doors, priced at \$210. Model 73, semi-highboy console, listing at \$265. Model 74, priced at \$315, identical with the 73 but has remote control. Model 75, semi-highboy phonograph combination with automatic record changing device which plays for thirty minutes, listing at \$375.

SEASON OF 1930-1931

New Radio Models

Alphabetical Listing of Exhibits for R. M. A. Show

The Acme Electric and Manufacturing Company has on display power transformers, audio frequency chokes, audio frequency transformers and a good many samples of coil windings and sub-assemblies which they manufacture for the makers of receiving sets.

The Acme Wire Co. is displaying samples of its a-f choke coils and other power coils, fixed paper condensers, varnished insulation, Celatsite, spaghetti tubing and magnet wire.

The Adler Manufacturing Company is exhibiting its complete line of console radio cabinets.

The Aerial Insulator Company, Inc., features antenna insulators and other aerial equipment.

The Aerovox Wireless Corp. is exhibiting its line of fixed mica, paper and electrolytic condensers, grid-leaks and mountings, interference eliminators and fixed processed and wire-wound resistors.

The All American Mohawk Corporation is showing the 1930 All American Lyric receivers and loudspeakers.

Allen-Bradley Co. is showing its entire line of resistors for radio purposes, including fixed and variable grid-leaks and carbon resistors of all types, potentiometers, volume controls, phonograph pick-up controls and resistors for the suppression of interference in ignition systems of automobiles.

Allen-Hough-Carryola Company is displaying its latest additions to the line of phonograph motors and pickups, and phonograph and loudspeaker units. Complete electrically operated phonographs in portable carrying cases, for attachment to radio receivers, are featured.

The Allan Mfg. and Electrical Corp. is showing its complete new line of Allan-A Bonded radio tubes.

The Aluminum Company of America features aluminum materials such as sheets, rods and tubes, panels, shields and knock-down cabinets and small aluminum parts.

Amperite Corporation feature automatic current controls, including a self-adjusting line control for a-c receivers. The two prongs of its UX type base are connected in series with the 80-volt primary wind-

ing of a power transformer in the radio. By means of a specially developed resistance element in the unit the supply current or



Amperite Line Voltage Control

voltage is regulated to within 10 per cent throughout a 30-volt fluctuation. It is made in various sizes to pass the amount of current required by all standard receivers.

The American Bosch Magneto Corporation has on display the 1930 Bosch line of radio receiving sets.

The Amrad Corporation is exhibiting a high-grade line of radio receivers.

The Anaconda Wire and Cable Company has an interesting display of connecting wire, cables and other wire products.

F. A. D. Andrea, Inc., is exhibiting five new Fada receivers, all with automatic volume control, pre-selector tuning and tone character control. The "Flashograph" dial window, which shows the lighted call letters of favorite stations is also a new feature.

The Arcturus Radio Tube Company has its complete line of a-c tubes on display along with the recent d-c additions to the line as well as photolytic cells.

The Atwater Kent Manufacturing Company is exhibiting the A-K receiver models for a-c, d-c and battery operation.

The Audak Company has a display of phonograph pick-ups.

The Audiola Radio Co. is displaying its two receiving set models, each of which employ screen-grid tubes in the r-f stages and a pair of '45s in push-pull for power.

SEASON OF 1930-1931

New Radio Models

Nathaniel Baldwin Incorporated is showing its new Baldwinette mantle receiver and Consolette Lowboy both with and without remote control. The Universal Portable is also an interesting model, operating from direct current, 25, 50 or 60-cycle alternating current, or from an automobile storage battery without any changes. When used with a storage battery a step-up converter is employed to supply plate voltage, drawing only one-half an ampere from the battery. The Hydaway model is built in a plain oak box designed to be hidden away in an out-of-the-way place and operated by remote control.

The Baldwin remote control kit may be used on any make of receiver and with as many as five control units. A dynamic speaker and a dual magnetic speaker are shown as well as the Baldwin dynamic phonograph pick-up, and a complete line of receiving tubes.

The Belden Mfg. Co. is showing its complete line of radio wire accessories, antenna kits, lightning arresters and ground clamps. A shielded lead-in wire is of interest. It consists of a stranded conductor with a copper braid shield.

Birnbach Radio Company is showing antenna wire, connecting wire, cables and soldering lugs.

The Bond Electric Corporation is exhibiting a complete line of Dry A, B, C and flashlight batteries, battery eliminators and vacuum tubes.

The L. S. Brach Mfg. Corp. is displaying its line of radio accessories which includes the Storm King and Storm Guard lightning arresters, antenna equipment, phone plugs, extension cords and cord connectors of various types, window lead-ins, glass insulators, ground clamps, soldering irons, flux, "Solderall," fixed crystals, electric clocks, Test-O-Lite, electric cord sets and rubber-covered hook-up and lead-in wire.

The Browning Drake Corp. is showing its new receiver models, with automatic call-letter tuning, automatic volume control, remote control and other features. There are five models, two of which are remotely controlled.

The Brunswick Company is showing a new line of receiver models, in which the "Style B" chassis is used with a 10-inch

electro-dynamic speaker. Three stages of r-f amplification are employed with screen grid tubes, a screen-grid power detector and a stage of resistance coupled a-f amplification with two '45 tubes operated in parallel. The four models shown are the Model 15 Low-boy, the Model 22 High-boy and the present two models, the S-14 and S-21.

Burgess Battery Co. Dry batteries of all descriptions, and flashlights.

Bush & Lane Piano Company are showing two new receiving set models, the 55 and the 75, both of which are Low-boys.

The Cable Radio Tube Company is showing the entire line of Speed vacuum tubes.

Capehart Corporation is exhibiting its line of automatic phonographs, coin-controlled automatic phonographs and phonograph combinations.

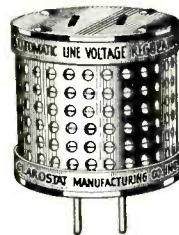
Cardon Phonocraft Corporation is displaying its complete line of a-c vacuum tubes.

The Caswell-Runyan Company is showing some very fine radio cabinets.

The CeCo Manufacturing Co., Inc., is displaying its complete line of radio tubes, including the a-c pentode, the new power pentode and the 866 half-wave mercury vapor rectifier. An interesting exhibit shows the various assembly stages of the pentode tube.

Central Radio Laboratories are displaying a line of small radio components such as variable grid-leaks, fixed carbon resistors, switches and switch contacts.

The Clarostat Mfg. Co. is showing its complete line of fixed and variable resist-



Line Voltage Regulator Clarostat

SEASON OF 1930-1931

New Radio Models

ors in all forms and ranging from grid leaks and small strip resistors to those capable of carrying 250 watts. One of the most interesting exhibits is the display of voltage regulators, both for building into a set and for use as an accessory for any set. The accessory type is arranged with a prong base and receptacle top so that it may be inserted between the wall outlet and the attachment plug.

The Colonial Radio Corporation is showing the Colonial receiving set line.

The Columbia Phonograph Company, in addition to its radio receivers, is showing a line of phonograph and loudspeaker units.

A new automatic phonograph which plays nine 10-inch records, and which is small and compact as well as popularly priced, is also being shown.

The Container Corporation of America is showing ways and means of packing radio receivers and supplies for shipment.

The Continental-Diamond Fiber Company has an interesting display of fibre sheet, rod and tube, as well as composition and metal panels.

The Cornish Wire Company, Inc., exhibits antenna equipment of great variety, connecting wire and cables, as well as a line of fixed paper condensers.

The Crosley Radio Corp. is exhibiting its new receivers and its Dynacoil and Dynacone loudspeakers.



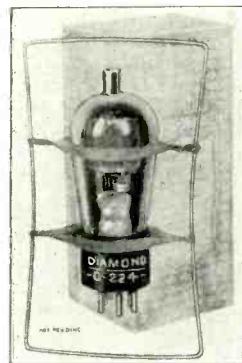
Crosley Chum

The Crowe Name Plate & Manufacturing Company is showing a line of radio dials, metal cable markers and panels and stamped name-plates.

E. T. Cunningham, Inc., is exhibiting the well-known line of Cunningham tubes, including the new 2-volt battery tubes.

The DeForest Radio Company's booth is fitted out with the DeForest line of receiving and transmitting tubes, short wave receivers and "Radiovisors."

The Diamond Electric Corporation has on display its entire line of dry batteries and radio tubes, the features of especial



Diamond Screen-Grid Tube in Shock-Absorbing Carton

interest being the reinforced screen-grid tube and the method of packing tubes for shipment.

The DeJur-Amsco Corporation is showing an extensive line of radio components for the manufacture of radio receivers. The line consists of variable condensers, dials, jacks, resistor mountings, phone plugs, fixed and variable wire-wound resistors and tube sockets.

The Dongan Electric Manufacturing Company is showing audio frequency choke coils, power transformers and ammeters and voltmeters.

The Dudlo Manufacturing Company has on display a complete line of wire products; aerial equipment, cables and connecting wire, a-f and r-f choke coils, audio and power transformers.

The Easton Coil Company is exhibiting radio frequency coils as well as a-f and r-f choke coils of all descriptions.

The H. H. Eby Manufacturing Company, Inc., has its line of parts on exhibition, in which are included the Eby binding posts, interference eliminators and tube sockets.

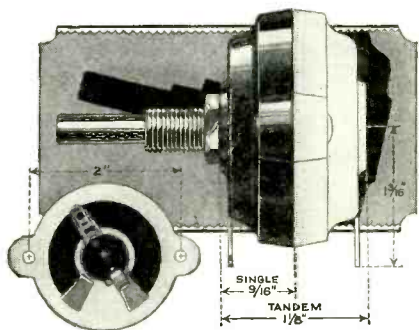
Thomas A. Edison, Inc., shows its complete new line of Edison Light-O-Matic receivers.

Electrad, Inc., is showing its new Loftin-White amplifier and tuner to go with it. The latter employs one stage of tuned r-f amplification and provides a

SEASON OF 1930-1931

New Radio Models

tuned circuit for the screen-grid tube in the amplifier, which serves as detector. The new Electrad Super Toratrol is also shown, as well as the line of parts which



Electrad Super Control

includes sub-panel brackets, fixed mica and paper condensers, fixed and variable grid leaks and mountings, jacks, fixed and variable processed and wire-wound resistors.

The Electrical Research Laboratories is exhibiting its three new Erla radio models, the 34, 36 and 38. Automatic volume control may be had in any of the three for a slight additional cost. This company is also showing its complete list of parts and accessories.

Essenbee Radio Devices Co. is exhibiting its Clar-A-Tone aerial booster, tube howl arrestor and various indoor, in-the-ground and ball antennas.

The Fansteel Products Company has an interesting display for the engineer, featuring various tantalum and molybdenum alloys.

John E. Fast & Company are showing a line of parts, featuring fixed paper condensers and audio frequency transformers.

The Federal Wood Products Corporation have a very interesting display of radio and phonograph combination cabinets.

The French Battery Co. is displaying its line of A, B and C radio batteries, aircraft batteries, telephone, ignition and flashlight batteries and Rotomatic and standard flashlights. The chief subject of the display is the new Ray-O-Vac auto-radio battery which has been designed to withstand excessive vibration, heat and cold, moisture and rough handling. The Ray-O-Vac radio tube line is also on exhibition.

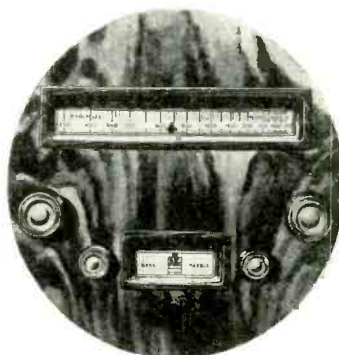
Herbert H. Frost, Inc., are showing tube adapters, sub-panel brackets, broadcast equipment, ground clamps, fixed mica condensers, headsets, jacks, convenience wall outlets, composition panels, phone plugs, fixed and variable wire-wound resistors, variable carbon resistors, tube sockets, switches and transmitting apparatus.

The Furnas Furniture Company is showing cabinets for radio receivers and phonograph combinations.

General Dry Batteries, Inc., is displaying a complete line of A, B and C batteries, including the new shielded weather-proof batteries for aircraft use.

The General Electric Company, in addition to its line of meters, phonograph motors, resistors, battery chargers, broadcasting and other equipment, is showing for the first time the complete line of new General Electric radio receivers.

General Motors is exhibiting for the first time its new line of radio receivers, of which there are five models. A single



General Motors Control Panel, Showing Tone Selector

chassis is used, employing three '24 screen-grid tubes, two '27s as detector and first audio stage, a pair of '45s in the power stage and an '80 rectifier.

General Industries Corp. display equipment for broadcast stations, including carbon and condenser type microphones, stands and springs, amplifiers, panels and racks.

The General Industries "Blue Flyer" and "Green Flyer" phonograph motors for home installation are interestingly shown.

SEASON OF 1930-1931

New Radio Models

General Radio Co. has a very extensive line of parts as well as radio service and laboratory equipment. Among those shown are tube adapters, aerial equipment and insulators, binding posts, broadcast equipment, a-f and r-f choke coils, r-f plug-in coils, fixed paper condensers, variable condensers, dials, jacks, phone plugs of various types, fixed and variable wire-wound resistors, tube sockets, switches, audio and power transformers, transmitting apparatus, piezoelectric crystals and all the attendant apparatus, and an endless line of testing equipment both for the laboratory and radio service shop.

The Gilby Wire Company has a display of cable, cables and connecting wire.

The Gold Seal Electric Company is featuring its Gold Seal radio tubes.

A. H. Grebe shows new SK4 models whose efficiency ratings are even higher than those of last season's production. All sets feature the "Colortone," with a new type of electrodynamic speaker, which is claimed to correct defects introduced in wire-network programs. Further claims include sharp tuning without cutting of sidebands.

Grigsby-Grunow Co. is showing its receiving sets and vacuum tubes. The latter line now consists of the G-26, G-27, G-71, G-45 and G-80.

The Gulbransen Company is displaying one new model, the Champion, Model 161. This receiver features tone control, 100% overload safety factor and a hand-carved cabinet of rare woods.

The Howard Radio Company is exhibiting its complete line of radio receivers, the Plymouth, Consolette, Puritan, Hepplewhite, Florentine and Gothic, all of which employ three screen-grid tubes, a power detector and a pair of '45s in the power stage.

The Hoyt Electrical Instrument Works is showing a-c and d-c ammeters, milliammeters and voltmeters as well as complete testing equipment for portable and shop use.

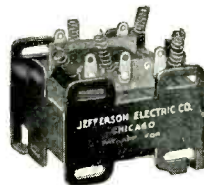
The Hygrade Lamp Company is showing its complete line of vacuum tubes, having some very interesting displays of tubes and of next season's advertising.

Insuline Corp. of America present a full line of radio conveniences including a new inside antenna as well as outside aerial and ground equipment. Another

new product is the ICA broadcast television and receiver for the use of experimenters. In addition it shows panels, tube sockets and adapters, dials and other composition insulation products.

The International Resistance Company has on display a line of fixed grid-leaks, mountings for same, tube reactivers, and fixed processed and carbon resistors.

The Jefferson Electric Company is showing its entire line of audio frequency transformers, replacement transformers,



Jefferson Type 372 Replacement Transformer

auto transformers for reducing 220-volt supply to 110 volts, fuses, fuse blocks and bases.

Jenkins Television Corp. have a complete showing of radiovisors, special television receivers, and photo-electric cells. These are particularly adapted to the reception of pictures transmitted from the company's laboratory at Jersey City, N. J.

The Jensen Radio Manufacturing Company is announcing three new models of electrodynamic speakers under the names "Concert," "Auditorium," and "Auditorium Junior," all of which have been greatly improved, both mechanically and electrically, over the models built last year. The Concert and Auditorium Junior models have 10-inch cones, and the Auditorium model has a 12-inch cone.

(Continued on Page 79)



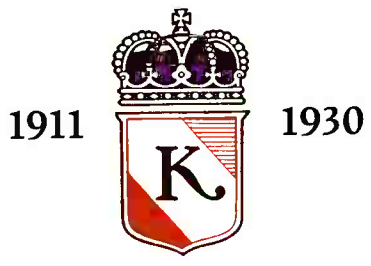
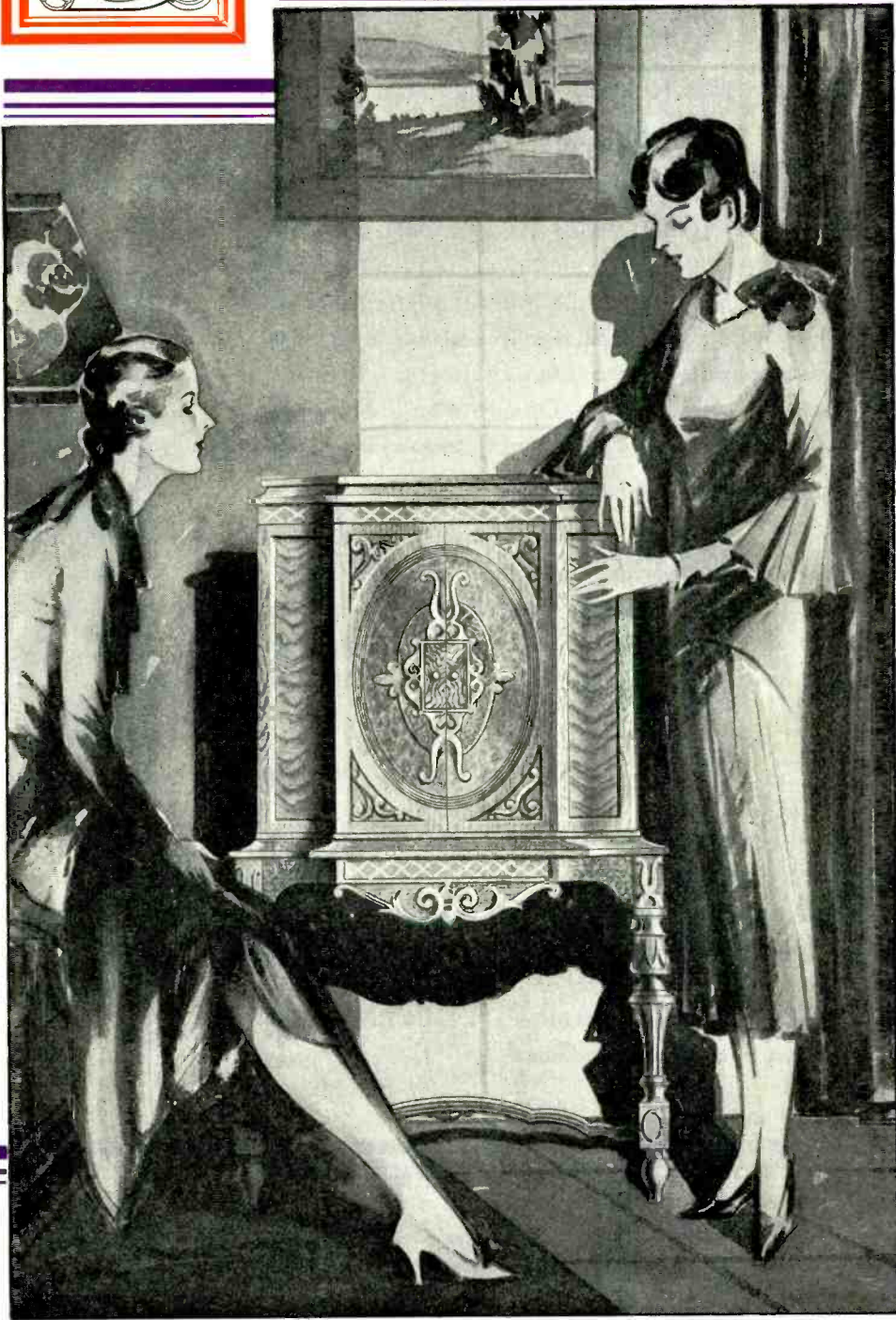
Jensen Concert Model

SEASON OF 1930-1931



Beauty

This year Kennedy strikes a dominant note in furniture—expressively beautiful woods, warmly toned and voguishly fashioned in rich designs. . . . The Life Tone of Kennedy is still further enhanced by the new Kennedy SELECTONE which permits true regulation of tone timber to please the ear of every listener. . . . Ask for complete details of The Royalty of Radio.



BE SURE

to Visit the KENNEDY Exhibit, Section B, Booths 20 and 21 . . . Demonstrations at Section AA, Rooms 11 and 12 . . . Special Demonstrations and Exhibits at The Royalty of Radio Headquarters, RITZ-CARLTON Hotel.

(OVER)

Cabinetry that Captures the Eye Life-Tone that Charms the Ear

BEAUTY! . . . A dynamic selling force, that instantly appeals to the most subtle and powerful buying influence in the world—*Woman*, purchasing agent for the American home! With one dashing stroke Kennedy this year adds a new and modish touch in furniture elegance . . . creating the positive impression that leads to greater sales!

LIFE-TONE! To describe the brilliant performance of the Royalty of Radio would merely add words to facts that already speak for themselves. . . . Here, too, Kennedy leads again! Quality *added* to Quality—the Life-Tone of Radio is re-presented in all the liquid fullness of life itself!

MERCHANDISING STABILITY! Doubly secured by the financial strength and vigorous sponsorship of leaders in industry, the Kennedy-originated *Protective Merchandising Policy* is still in full force. It secures for every dealer the full reward of individual effort—the paved highway leading directly to substantial growth and profitable business.

DEALERS, DISTRIBUTORS! Look forward to this source of greater profit. . . . Benefit by all the advantages that Kennedy offers—the eye appeal of modish beauty . . . the matchless brilliance of radio Life-Tone . . . prices that tempt the purse of every buyer . . . a sound protective policy forcefully carried out . . . full merchandising cooperation . . . assured stability and the vigorous sponsorship of leaders in radio and industry . . . Colin B. Kennedy Corporation, South Bend, Indiana.



KENNEDY

The Royalty of Radio

New Radio Models

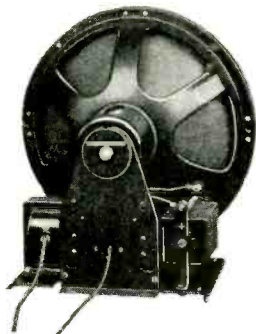
(Continued from Page 74)

The Colin B. Kennedy Corporation has the Kennedy receiver line on display. Electro-dynamic loudspeakers are also being shown.

The Ken-Rad Corporation is exhibiting its line of vacuum tubes.

The Kester Solder Company has an interesting display of the various types of Kester self-fluxing solder.

Magnavox Company is displaying a number of new dynamic speaker units with $7\frac{3}{4}$ in., $10\frac{1}{2}$ in. and $12\frac{1}{2}$ in. cones.



Magnavox A-C Dynamic Speaker

The small model is adaptable for use in miniature size sets and the large, or Mastodon, model for public address installations. Each is obtainable for operation



Magnavox D-C Dynamic Speaker With 2500-ohm Field for Operation Between 110 Volts (44 ma) and 190 Volts (76 ma)

from either d-c or a-c at various standard voltages, the a-c models being equipped with disc-type rectifiers.

The Marvin Radio Tube Corporation is showing its a-c tube line in an interesting exhibit.

The McMillan Radio Corporation is exhibiting its radio cabinets and receiving sets.

The Micarta Fabricators, Inc., are exhibiting many unusual stampings and machined parts, threaded coils, control gears and large sheets of laminated phenolic insulating material. Sheets in the 48x96 in. size and smaller are shown in colors.

The Micamold Radio Corporation is showing its line of radio components, including fixed grid-leaks, and fixed mica and paper condensers.

Leslie F. Muter Company has a very full line of radio parts and accessories on exhibit, including aerial equipment, ground clamps, battery clips, a-f and r-f choke coils, fixed mica and paper condensers, variable condensers, fixed and variable grid-leaks, loudspeakers, phone plugs, fixed and variable wire-wound resistors, switches, a-f and power transformers and phonograph and loudspeaker units.

The National Carbon Company, in addition to its Eveready dry batteries, flashlights and standard line of Eveready-Raytheon tubes, is exhibiting a new line of tubes especially designed for low current consumption. It is also introducing a radio receiver, which is claimed to be comparable with modern a-c receivers, designed around the new tubes and intended for use with dry "A" and "B" batteries; aimed, of course, at the farmer market.

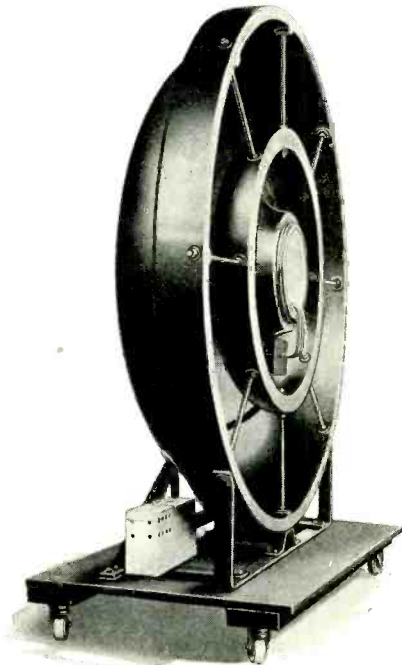
The National Company's booth is filled with a very complete line of accessories and radio components. Included are a-f amplifiers, battery eliminators, a-f and r-f choke coils, variable condensers, condenser shafts and couplings, dials and dial lights, fixed grid-leaks and resistor mountings, metal panels, phone plugs, receiving sets and kits, rectifier units, fixed carbon and wire and variable wire resistors, shields, tube sockets, testing equipment, a-f and power transformers, transmitting equipment and voltage regulators.

The National Radio Tube Corporation is exhibiting its line of vacuum tubes.

The National Union Radio Corporation has an interesting demonstration showing the basic principles in the making of the vacuum tube. A giant screen-grid tube is built, taken apart and rebuilt continuously by a group of girl demonstrators.

SEASON OF 1930-1931

New Radio Models



Operadio Uni-Directional Bowl Speaker

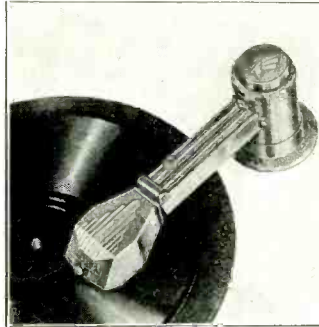
Operadio Mfg. Co., St. Charles, Ill., displays a comprehensive group of audio power amplifiers as well as outdoor and indoor models of its uni-directional bowl speaker. This unit functions as an ordinary electrodynamic speaker to the front, but the sound energy from the rear of the diaphragm is developed exponentially and reflected to the front through the full area of the large bowl. It is well adapted for use in narrow theaters and outdoor public address work where concentrated volume is desired.

Philmore Mfg. Co. is exhibiting its one-two- and three-tube battery operated receiving sets, crystal sets and crystals, phone plugs, aerial kits, antenna insulators, lightning arrestors, screw eyes, lead-in strips, extension cords, rheostats, binding posts and a line of radio tubes.

The Philadelphia Storage Battery Company, in addition to the Philco radio receivers, is showing Philco storage batteries, chargers, battery eliminators and power units, loudspeakers, rectifier units, and the new line of Philco tubes.

The Potter Company is showing its fixed condensers for filtering and by-passing. These are made with mica, paper and electrolyte dielectric. The condenser type speaker is also featured in this exhibit.

Pacnet Electric Company, Inc., has on display an extensive line of parts and accessories for the radio receiver, including tube adapters, audio amplifiers, battery eliminators, r-f coils, variable condensers, dials, fixed grid-leaks, headsets, jacks, loudspeakers, phonograph motors and



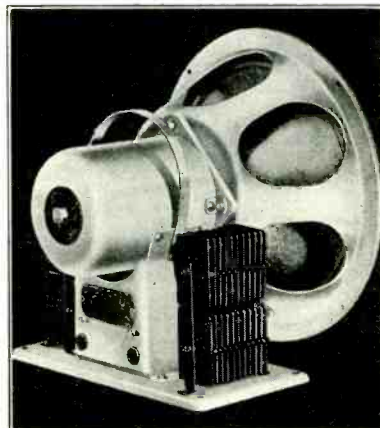
The Pacnet Master Phonovox

pick-ups, fixed and variable wire-wound resistors, tubes, sockets, switches and a-f transformers.

The new Pacnet Master Phonovox has a lower center of gravity, ON-OFF switch and volume control mounted in the base, and several other improved mechanical and electrical features.

The Perryman Electric Company is exhibiting its vacuum tubes for transmitting and receiving purposes.

The Oxford Radio Corporation is exhibiting its complete line of speakers for home and theater installation. The latest



Oxford Model 71 A-C Theatre Speaker

addition to the line is the Oxford Chromatrop, which is shown, among other forms, in an electric phonograph cabinet, space being provided for a radio receiver if desired.

SEASON OF 1930-1931

New Radio Models

The Polymet Manufacturing Corporation has on its list of parts paper by-pass and filter condensers, mica condensers, tubular, flat and flexible resistors, coil windings, enameled magnet wire, electrolytic condensers, volume controls and audio and power transformers, the last four of which are new products. The new electrolytic condensers are available in from $1\frac{3}{8}$ to 3 in., and in capacities up to 72 μ fs. They are supplied with the standard top terminals or for "upside down" mounting in a receptacle. The variable resistors are manufactured in both the carbon and wire-wound types.

RCA Radiotron Co., Inc., in addition to a complete line of a-c and d-c Radiotrons show three new d-c tubes with low filament current consumption from a 2-volt supply. These include a screen-grid and a general purpose tube, each of which draws .06 amperes, and a power output tube which draws .15 amperes. Each uses an oxide-coated filament. These tubes are well adapted for use in automobile radios.

The new screen-grid Radiotron is recommended as an r-f amplifier in specially

designed high-impedance circuits with 135 volts on the plate, $67\frac{1}{2}$ volts on the screen-grid, and -3 volts on the control grid. The plate draws 1.5 ma and the screen-grid .5 ma. The plate resistance is 800,000 ohms, the amplification factor is 440, the mutual conductance 550 micromhos, and the effective grid-plate capacitance .02 μ mf maximum. The tube has a large UX base.

The new general purpose Radiotron is useful either as a detector or amplifier and is similar in external appearance to the UX-199. It draws 2 ma with 90 volts on the plate and -4.5 volts on the grid. It



New Screen-Grid Radiotron UX232



New Power Output New General Purpose Radiotron UX231 Radiotron UX230

has a plate resistance of 12,500 ohms, an amplification factor of 8.8 and a mutual conductance of 700 micromhos. It has a small UX base. When used as a detector there should be 45 volts on the plate with a .00025 μ f grid condenser and 2 to 5 megohm grid-leak.

The new power output Radiotron has a plate current drain of 8 ma with 135 volts on the plate and -22.5 volts on the grid. It has a plate resistance of 4600 ohms, an amplification factor of 3.5, a mutual conductance of 875 micromhos, and an undistorted power output of 170 milliwatts. It has a small UX base.

The Radiola Division of the R. C. A. is displaying the entirely new Radiola line of superheterodyne tuned r-f receivers.

The R. C. A.-Victor Company, Inc., has the Victor receivers and phonograph models on display.

SEASON OF 1930-1931

New Radio Models

The Racon Electric Company has its complete line of electro-dynamic loudspeakers on display.

The Radio Master Corporation is exhibiting its radio cabinets.

Radio Products Co. are exhibiting their entire line of radio testing equipment, the newest instrument being the "DayRad" automobile radio set analyzer. Among the other instruments are three styles of a-c tube checkers, a pre-heater, an a-c, d-c radio set analyzer, a portable combination of the latter and the type B tube checker, a direct reading ohmmeter, an oscillator which combines an output meter, oscillator and grid dip meter, and finally a shop test panel.

Readrite Meter Works is showing its complete line of meters, both a-c and d-c, for panel, pocket and portable use. A line of testing and servicing equipment such as tube and set analyzers and ohmmeters is also displayed, as well as the company's fixed, wire-wound resistors. The latter are constructed on porcelain tubes and covered with baked enamel.

The Rola Company is featuring in its display the new Model "S" electro-dynamic speaker. This has been designed primarily for the suddenly popular mantel receiver, measuring $8\frac{1}{4}$ in. overall diameter, and $4\frac{3}{8}$ in. in depth, and weighing less than three pounds with the input



Rola Model "S" Electro-Dynamic Speaker

transformer. It operates at from 100 to 125 volts and draws from 45 to 50 milliamperes, although fields can be wound to meet other voltage requirements.

The Samson Electric Co. is displaying its various types of a-c and d-c amplifiers including the recording, reproducing and photo-electric types. Quite a variety of broadcast and public address equipment is shown, as well as r-f choke coils, audio transformers and faders.

Sampson Industries, Inc., are showing the new product, "Stiktape Aerial." This is a non-corrosive alloy coated on back with adhesive rubber so that it will stick to the walls, windows or whatever it is handy.

The Sangamo Electric Company is showing its line of fixed mica condensers and audio frequency transformers. Of the former there are both the type for general distribution and the manufacturer's type, known as the Illini unit.

The Scoville Manufacturing Company is showing its list of variable condensers, condenser shafts and couplings, dials, soldering lugs, metal panels and nameplates.

Silver-Marshall, Inc., is displaying a very comprehensive line of radio parts and accessories as well as the four new radio receiver models. The list includes audio amplifiers, battery eliminators, a-f and r-f coils of all descriptions, variable condensers, dials, loudspeakers, shields, sockets and audio and power transformers. A complete line of short wave receiving apparatus is also shown.

Sparks-Withington Company is exhibiting the complete Sparton receiver line.

Sprague Specialties Company displays a line of fixed paper condensers for filtering and by-pass use.

The Starr Piano Company is showing its complete line of radio and phonograph combination cabinets.

The Steinite Company is showing the entire line of Steinite radio receivers.

Sterling Manufacturing Company has in its booth an interesting display of loudspeakers, ammeters, voltmeters, radio testing equipment for shop and portable use, tube reactivators and metal panels.

The Stettner Phonograph Corporation specializes in radio and phonograph cabinets, a number of which are on display.

SEASON OF 1930-1931

New Radio Models

The Stevens Mfg. Corp. is displaying its dynamic speaker units in which is employed the new corrugated diaphragm. There are also on display some of the new 33 1/3 r.p.m. turntables for the large 16-in. records used in recorded broadcast pro-



Stevens Resistance Coupled Amplifier

grams and synchronized film-sound reproduction, as well as the Stevens-Sibley phonograph motor. The latest addition to the line consists of auditorium and home use direct coupled audio amplifiers.

The Stewart-Warner Corporation is exhibiting its line of radio receivers and loudspeakers.

The Story and Clark Radio Corporation is showing its new line of radio receiving sets and phonograph combinations.

Stromberg-Carlson Telephone Manufacturing Company has on exhibition its radio receivers, loudspeakers, battery eliminators and phonograph pick-ups.

The Super-Ball Antenna Company has a display of its ball type antennas.

The Superior Cabinet Corp. is showing its complete line of cabinets, including the combination cabinet models C-2 and C-3, which are equipped with the RCA low impedance pick-up, transformer and scratch filter, tone arm, volume control, General Industries a-c induction motor, switch and needle cups.

Swan-Haverstick, Inc., is showing a display of aerial equipment, convenience wall outlets and other accessories for the installation of a radio receiver.

Sylvania Products Co. introduce new quick-heating SY-224 and SY-227 tubes which they have found to have long life, the ability to withstand considerable fluctuation in voltage, and to be without hum or microphonic tendencies. These tubes have a special insulating material between the heater and the cathode sleeve, use a new-shaped mica support, and employ a looped type filament. A new 484 tube for



Spartan receivers is also announced; it has an indirectly heated cathode which requires 3 volts for operation.

The Transformer Corporation of America is showing, in addition to the regular line of battery eliminators, a-f choke coils and a-f transformers, its new



Clarion Model A-C 53

a-c screen-grid radio receiving sets which have been given the trade name "Clarion."

The Triad Manufacturing Company is featuring a display of Triad radio tubes.

Tung-Sol Radio Tubes, Inc., is exhibiting its complete line of vacuum tubes.

The United Scientific Laboratories are showing their line of a-c, d-c and battery operated Pierce Airo chassis and their variable condensers. The latest Pierce Airo receiver chassis is the d-c model 727, which has three '24 screen-grid tubes, two as r-f amplifiers and one as detector, a pair of '27s and a pair of '45s in two push-pull audio stages.

SEASON OF 1930-1931

New Radio Models

The United Air Cleaner Corporation is showing its loudspeakers, phonograph motors and pick-ups, receiving sets and vacuum tubes.

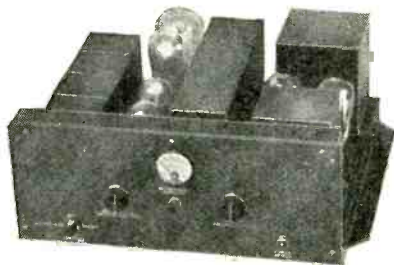
The United States Radio & Television Corporation has on display its new line of radio receivers, including two a-c models, two battery models, one of which is a metallic table model, and an automobile set. The latter employs screen-grid r-f amplification, in which 2 '24 a-c tubes are used, a '26 detector, a '01-A and a '71-A in the audio stages. The first three tubes have their filaments connected in series in order to use the full six volts from the car's storage battery without drawing any more current than a single tube. An easily mounted and attractive panel fits onto the dashboard while the receiver and speaker are mounted under the cowl or hood.

Utah Radio Products Company has on display all its parts and accessories to radio receiver manufacturing and installation, including tube adapters, a-f choke coils, jacks, loudspeakers, phonograph motors and pick-ups, convenience wall outlets, name-plates, fixed processed and wire-wound resistors, variable carbon and wire-wound resistors, shields, switches and audio and power transformers.

Valley Appliances, Inc., is showing its line of electro-dynamic speakers.

The Victoreen Radio Company is starting off its first year in the receiver field with an exhibit of its three superheterodyne models. This firm has heretofore manufactured superheterodyne kits and parts.

The Webster Company, Chicago, displays a complete line of power amplifiers and associated equipment for use with radio, phonograph or microphone. The



Webster D-250 Amplifier

Model D-250 which is illustrated herewith uses a '27 tube in the first stage, two '27s in push-pull in the second stage, and two

'50 tubes in push-pull in the third stage, which is sufficient to operate from two to five electrodynamic speakers. Other models are made with a vertical panel layout for theater use. Accessory equipment includes micro-control boxes, pre-amplifiers, faders and power packs.

Wells-Gardner Company displays its line of radio receivers.

The Westinghouse Electric and Manufacturing Company is exhibiting, along with its new receivers, a line of battery chargers, voltmeters and ammeters, phonograph motors, name-plates, vacuum tubes and broadcast equipment.

The Weston Electrical Instrument Corp. is showing its various a-c, d-c and thermo-couple meters for panel and portable use, as well as its complete line of radio set analyzers, tube checkers and testers and capacity and resistance meters.



Weston Model 555 Tube Checker

The latest addition to the Weston line is the Model 555 Counter Tube Checker which checks all a-c and d-c tubes, including the rectifiers and screen-grid tubes, without adapters. A line voltage control is included.

Wright-DeCoster, Inc., is showing its electro-dynamic loudspeakers for home, theater and public address use, as well as horns and baffles for all types of Wright-DeCoster speakers.

The Yaxley Mfg. Co. is exhibiting its complete line of small parts for radio sets and installation. The list includes dial lights, jacks, soldering lugs, metal cable markers, phone plugs, fixed and variable wire wound resistors, including faders for public address and broadcast use, switches, relays and an assortment of convenience wall outlets for the home.

SEASON OF 1930-1931

Radiotorial Comment

By the Editor

THE contest for supremacy during the new season whose opening is coincident with that of the RMA trade show starts from scratch. The weak contestants have been eliminated in the trial heats of the last five years. The present contenders are veterans in either the radio, electrical or automotive fields.

The Race Begins

Prices have been stabilized and unsuccessful policies have been superseded. Circuits and styles have been well determined by the show exhibits, although a few factories are withholding data regarding their new sets till later in the season. The ascribed reason is that the first showing of a new model has often been the target for imitation by less progressive firms.

Warehouse stocks are low and must soon be filled by the production of new models. The supply will come from the well-established old concerns and from a few new manufacturers of complete sets, much fewer than in any year previous. With the promise of a good year ahead, they are off!

ONE of the most perplexing questions that the radio dealer has always had to face is whether it is more profitable for him to limit himself to one line of sets or to handle several popular brands. It

Selling One or Several Lines?

is true that no single line has ever held supremacy as a "best seller" for a very long period of time, and it certainly is an advantage to be handling a line during the period of its supremacy. Why, then, should not the dealer increase his chances "at the bat" by handling several popular makes, each of which might at any time become the country's "best seller"?

Furthermore, the history of radio bears testimony that when a radio receiver is enjoying unusual popularity the demand is liable to exceed the supply, and the dealer fills his waste basket with canceled orders. If, however, he had been carrying two or more lines, the shortage of one would not completely halt his

efforts; he could turn his attention, and perhaps that of his prospects, to receivers of another make.

It has also been learned through bitter experience that sales of one receiver always slow up when improvements are announced by its makers. Ofttimes a groundless rumor will have the same effect right at the peak of a set's popularity. Here again the dealer's only salvation is his secondary line of defense, without which he must fight against a terrific sales resistance, and if history is to repeat itself, may lose.

To carry more than one line, then, is to increase his chances of "cashing in" on temporary popularity as well as to carry insurance against shortage or any of the storms that may arise overnight and slow up the sale of any particular line of radio sets.

On the other hand it is very wisely argued that it is better psychology for the dealer to handle only one make because it gives the customer the impression that the chosen brand is the first and last choice of the dealer. It allows him and his salesmen to sell themselves on one particular product, which is one of the first laws laid down for salesmen by experts in that line. Certainly it must be embarrassing at times for the salesman to wax eloquent about the merits of one make of receiver, then upon finding that his prospect's eye is attracted to another, to be just as enthusiastic in his praise of the second. It smacks of insincerity.

With a single line in his showrooms the dealer can become more familiar with the merchandise he has to offer. His whole organization can become more thoroughly equipped to give service, whether it be demonstration, shipping or technical. The dealer and all his employees become specialists in the extreme, and when either the prospect or the old customer enters the room he will sense in the air that "there is one radio and only one radio and Mr. Dealer is its messenger."

With such good arguments on both sides of the question it is indeed difficult for the dealer to decide which policy to adopt. The present trend and pressure is distinctly toward the one-set dealer. Time only will tell whether it is the best policy.

NEWS of the Radio Trade

Acme Electric & Mfg. Co. announce the appointment of the following representatives for their line of power transformers, chokes, audios and auxiliary equipment which is sold to radio manufacturers: Clark and Baehr, Cleveland, Ohio; L. B. Weyburn, Chicago, Ill.; M. J. Powers, New York City, N. Y.; R. V. Pettingell, Winchester, Mass.; H. A. Ledig, Philadelphia, Pa.; S. Gillen Hyman, Toronto, Canada.

Arcturus Radio Tube Co., Newark, N. J., are making photoelectric cells for transforming light into electrical energy,



Arcturus Photoelectric Cell

particularly as applied in sound projection.

Atwater Kent Mfg. Co. have appointed Frank M. Brown Co. of Portland and Bangor, Maine, as distributor throughout the state of Maine, and Keith Simmons Co. as distributors at Nashville and Memphis, Tenn.

Audiola Radio Co., 430 South Green Street, Chicago, instead of specializing in the radio chassis business, as in the past, will hereafter specialize on a line of complete sets to be sold through well-rated jobbers. This company enters its ninth year as a manufacturer of radio equipment, with the following executive personnel: Mortimer Frankel, president and general manager; M. J. Marco, chief engineer; E. J. Glennon, vice-president and production manager; H. E. Anderson, secretary, and Charles W. Strawn, sales manager. All except Mr. Strawn have been associated with the company for from four to nine years, he having been recently in charge of sales promotion for U. S. Radio & Television Co. and formerly an executive in the music industry.

Continental Radio Corp., New York City, distributors of Radiolas, announce the election of George J. Eltz, Jr., as vice-president.



A. A. Trostler, Brunswick Sales Manager

A. A. Trostler, Sales Manager of the Radio Panatropé Division of the Brunswick-Balke-Collender Company, has announced reduction in price on the 1930 four screen-grid tube radio combination model to a list price of \$185.

Brunswick Radio and Panatropé Division, now a subsidiary of Warner Brothers Pictures, Inc., has established executive offices in the Wurlitzer Bldg., New York City. Sales Manager A. A. Trostler announces the appointment of the following new distributors: Coast Radio Supply Co., 123 Tenth Street, San Francisco, Calif. Gustin-Bacon Mfg. Co., 1412-14 W. Twelfth Street, Kansas City, Mo. D. H. Holmes Co., Ltd., 819 Canal Street, New Orleans, La. House of Crane, 124-6 So. Meridian Street, Indianapolis, Ind. Hudson Valley Asbestos Corp., 15 Westerlo Street, Albany, N. Y. Kelvinator-Georgia, Inc., 348 Peachtree Street, Atlanta, Ga. Kimberly Radio Corporation, 154 East Erie Street, Chicago, Ill. M. & W. Radio Co., 657 No. High Street, Columbus, Ohio. Oriole Distributing Co., Inc., 410 W. Lombard Street, Baltimore, Md. Raymond Rosen & Co., 49 North Seventh Street, Philadelphia, Pa. Selco, Inc., 708 Broadway, Cincinnati, Ohio. The Voss-Hutton Co., 214 W. Fourth Street, Little Rock, Ark. Whitney Distributing Co., 426 So. Sixth Street, Minneapolis, Minn. Zion's Co-operative Mercantile Institution, 351 Z. C. M. I. Avenue, Salt Lake City, Utah.

Caswell Mfg. Co., Milwaukee, Wis., present the Power Tone as a portable

phonograph with motor-driven turntable and with a pick-up unit whose impedance is matched to that of a radio receiver with which it is to be used.

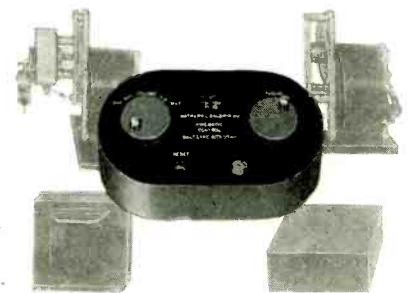
De Forest Radio Co. of Passaic, N. J., is handling orders for transmitting tubes and complete transmitters for non-toll communication purposes.

CeCo Mfg. Co. is starting a campaign to open up the tube replacement market. The plan is explained in a portfolio which is supplied to dealers and by means of radio talks by President Ernest Kauer.

Eagle Electric Mfg. Co., Brooklyn, N. Y., are marketing a new trouble lamp equipped with a rubber handle with a bayonet lock for the lamp socket and with a 12 or 20-ft. 3/8-in. water-proofed cable.

Dubilier Condenser Corporation has appointed as its representative at Milwaukee, Wis., the Evan Williams Electric Sales Co., and at St. Louis, Mo., the E. B. Henderson Co.

Nathaniel Baldwin is making a remote control kit which consists of a tuning unit with tuning knob, volume control, on-off switch and a dial, and two small motors to operate the tuning control and



Baldwin Remote Control Kit

volume knob of the receiver. It may be used with any receiver in or out of a cabinet, and as many as five control units may be employed with a single pair of motors. Continuous tuning of the station selector dial is possible. The tuning unit measures 1 3/8 in. high, 6 in. long and 3 1/4 in. deep, and is connected to the motors at the receiver by a small multiple wire cable.

New Nathaniel Baldwin Distributors include Bihl Brothers, Buffalo, N. Y.; Ackerman Electrical Supply Co., Grand Rapids, Mich.; Harrison Wholesale, Chicago, Ill., and R. F. & W. B. Fitch Co., Oskaloosa, Iowa.

Edison radios are to be distributed by the Belmont Corporation of Minneapolis throughout Minnesota, North Dakota and bordering portions of South Dakota, Iowa, Michigan, Montana and Wisconsin. Most of Iowa is to be covered by the Stoner Piano Co. of Des Moines.

Electro-Motive Engineering Corp., 127 West 17th Street, New York City, is supplying radio set manufacturers with carbon resistors in all sizes and capacities from $\frac{1}{2}$ to 15 watts and within a tolerance of ± 5 per cent, vitreous enameled wire-wound resistors rated at 7.2 watts per sq. in. of outside surface and tested to within 10 per cent of its rated resistance, moulded bakelite mica condensers in capacities from .000025 to .02 μf , and volume controls of the wire-wound and graphite types.

First National Radio Corp., 254 W. Fifty-fourth Street, New York City, is making an 8-tube chassis for private brand sets. It requires three '24 tubes as r-f amplifiers, one '27 as power detector, one '27 for first audio, two '45s for push-pull second audio, and '80 for rectifier. Tuning is accomplished with a 4-gang synchronized condenser, individually and totally shielded. Its dimensions are 21 by 8 by $9\frac{1}{2}$ in. and price to dealers is \$35.

General Radio Co. of Cambridge, Mass., is adding a four-story building to house research laboratories and produce special r-f laboratory equipment.

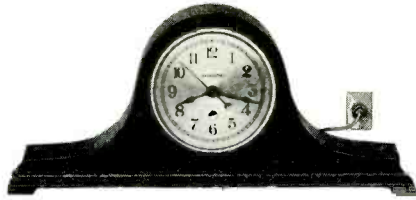
Grigsby-Grunow Co. has a working arrangement with Prof. H. R. George of Purdue University to make experiments in television with a cathode-ray tube.



H. T. Roberts, Sales Manager Radio Division of The Gulbransen Company

The Gulbransen Company of Chicago has announced the appointment of Henry T. Roberts, formerly of the U. S. Radio and Television Company, as sales manager of the Radio Division of the Gulbransen Company. He is a pioneer in the merchandising of radio, having founded the H. T. Roberts Company in 1921.

His sales managerial experience dates back to the early automobile days. For many years previous to radio he was an outstanding figure in the phonograph field.

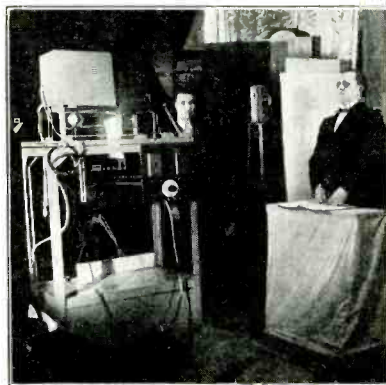


Hammond Clock Co. of Chicago announces three new models of synchronous electric clocks, a kitchen model $8\frac{1}{2}$ in. wide to sell at \$9.75 and two tambour shape models, the Arlington, $12\frac{1}{2}$ in. wide, to sell at \$14.50 and the Berkeley, 19 in. wide, to sell at \$17.50. These clocks operate from a 110-volt a-c circuit.

High Frequency Labs. of Chicago present the Mastertone set as the embodiment of clean-cut 10 kc selectivity with great fidelity of tone reproduction. It employs a superheterodyne circuit devised by Chas. L. Hopkins so that the intermediate amplifier is claimed to give the effect of a band-pass filter with a single hump whose band width is adjusted to 10 kc with a sharp cut-off at each side. This is a nine-tube set with '24 tubes in the t-r-f., two i-f, 1st and 2nd detector stages, '27 tubes in the oscillator and 1st audio, and '45 tubes in the push-pull 2nd audio. The i-f frequency is 180-200 kc.

Howard Radio Co. of South Haven, Mich., announces that its screen-grid receivers are now installed in Capehart products. S. J. Helsper has been appointed Eastern sales manager, with headquarters at Philadelphia.

Jenkins Television Corp., in connection with a series of experimental picture broadcasts from W2XCR at Jersey City, N. J., has developed the "camera"



Jenkins Television "Camera"

illustrated herewith in order to "pick-up" the image of a fully illuminated subject. This "camera" consists of a photo-

electric cell, lenses, amplifiers and batteries. Sound is also picked up by a microphone and transmitted on a separate channel as an accompaniment to the transmitted picture.

Jewell Electrical Instrument Co. has established a department to assist the amateur in the proper selection of measuring instruments. In this connection it has issued a 16-page booklet on "service equipment that pays for itself."

Johnsonburg Radio Corp., Johnsonburg, Pa., are using a new type of rigid construction in JRC radio tubes so as to insulate the filament and eliminate possibility of short circuit between elements. Tubes are wrapped in cellophane at factory to insure newness.

The Ken-Rad Corp. of Owensboro, Kentucky, is now represented by Wilbur C. Tillitt in western Pennsylvania, Ohio and West Virginia.

Lynch Mfg. Co. of New York City are featuring a metallized dynohmic resistor whose metal-molded end cap gives positive connection. It is tapered for insertion in standard mountings. These resistors are also made in a pig-tail type. The Lynch new precision wire-wound resistors are made in graduated sizes from 500 to 500,000 ohms with corresponding current ratings of from 44.6 to 1.41 ma. The company is looking for new distributors on an exclusive basis.

Motor Parts Company, Philco Branch, of Philadelphia, Pa., have appointed Frank Evans, formerly district representative for the Amrad Radio Corp., as sales manager.

Mueller Elec. Co. of Cleveland is introducing a rubber-insulated lead-in strip



Dry Ribbon

for bringing aerial wire under a window sash. A rubber cap covers the outdoor screw connection.

National Union Radio Corporation of New York City announces the appointment of Dr. Ralph E. Myers as vice-president in charge of engineering and production. He was with the Westinghouse Lamp Co. for 21 years, lately having been chief engineer in charge of lamps and radio tubes.

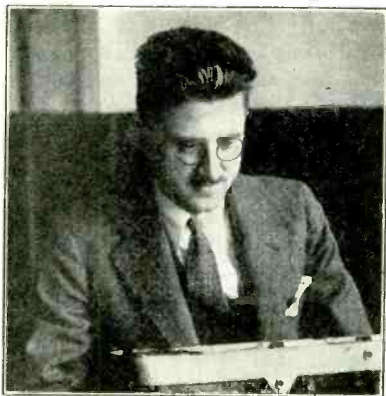
Pierce-Airo, Inc., is producing several new chassis models for private brand sets. The a-c model illustrated, as well as a corresponding d-c model which uses a-c tubes, uses screen-grid tubes in the



Pierce-Airo Model A-C 724

r-f circuit. It has special selector tuning and push-pull audio amplification. Provision is made for phonograph attachment.

Philadelphia Storage Battery Co., under the direction of Robert F. Herr, Philco service engineer, have organized Philco service men throughout the coun-



Robert F. Herr, Philco Service Engineer

try into a coöperative informational exchange to meet such problems as the elimination of interference, etc. Weekly bulletins are issued on the solution of difficult service problems.

The Pooley Co. of Philadelphia are making private showings of some revolutionary ideas in radio cabinet design. The line is to be sold through only one large outlet in each metropolitan area.

Radiola Division RCA Victor Co. announces that the Milnor Elec. Co. of Columbus and Dayton, Ohio, will continue distribution of RCA Radiolas in southern Ohio, southeastern Indiana and northern Kentucky. Harper-Magee, Inc. Seattle, Wash., have been appointed distributors in Washington and Oregon, and Geo. L. Patterson, Inc., (formerly Stanley & Patterson, Inc.) in New York City.

The list of RCA licenses for set manufacture includes All American Mohawk Corp., American Bosch Magneto Corp., American Telephone & Telegraph Co., American Transformer Co., Amrad Corp., F. A. D. Andrea, Inc., Apex Electric Mfg. Co., Atwater Kent Mfg. Co., Audiola Radio Co., Balkeit Prod. Co., Bremer Tully Mfg. Co., Brunswick-Balke-Collender Co., Buckingham Radio Corp., Bush & Lane Piano Co., Case Electric Co., Colonial Radio Corp., Columbia Phonograph Co., Columbia Radio Corp., Continental Radio Corp., Crosley Radio Corp., Earl Radio Corp., H. H. Eby Mfg. Co., Thomas A. Edison, Inc., Electrical Research Lab., Electrad, Inc., Farrand Mfg. Co., Inc.; Ferranti, Inc.; First National Radio Corp., Gilfillan Bros., Inc.; General Radio Co., Graybar Electric Co., Grigsby-Grunow Co., A. H. Grebe Co., Gulbransen Co., Howard Radio Co., Kellogg Switchboard & Supply Co., Colin B. Kennedy Corp., King Mfg. Corp., Kolster Radio Corp., National Co., Nathaniel Baldwin, Inc.; Philadelphia Storage Battery Co., Silver-Marshall, Inc.; Sonora Phonograph Co., Sparks-Withington Co., Steinite Radio Co., Sterling Mfg. Co., Stewart-Warner Corp., Story & Clark Radio Corp., Stromberg-Carlson Tel. Mfg. Co., Temple Corp., Transformer Corp. of America, United Reproducers Corp., U. S. Radio & Television Corp., Wells Gardner Co., Walbert Mfg. Co., Zenith Radio Corp.

The tube manufacturers who are licensed under RCA patents are: Allan Mfg. & Elec. Corp., CeCo Manufacturing Co., Inc.; Champion Radio Works, Inc.; Hygrade Lamp Co., Ken-Rad Corp., Matchless Electric Co., National Union Radio Corp., Nilco Lamp Works, Perryman Electric Co., Raytheon Mfg. Co., Triad Mfg. Co., Tung-Sol Radio Tubes, Inc.; United Radio and Electric Corp.

Radiola Division of RCA Victor Co. has appointed as Radiola distributors in eastern New York and Berkshire Co., Mass., the Adirondack Radio Distributors, Inc. The Radio Distributing Corp. of Newark and Trenton will continue to handle Radiolas in the northern part of New Jersey and the Aeolian Company of Missouri will continue as representative in eastern Missouri and southern Illinois through its St. Louis headquarters.

Radio Reception Co., Inc., of New York City announce a new power amplifier which uses two UV-845 tubes in the last stage to give an output of 50 watts. It is intended where either fine quality is desired or large areas are to be covered.

Radio Products Co., Dayton, Ohio, announces the appointment of Walter W. Boes as general sales manager. This company makes and sells a complete line



Day Rad Set Analyzer

of radio service equipment, including the Day Rad tube checkers and set analyzer.

The Sparks-Withington Company have made the Cross, Purser-Bull Company, Ltd. Spartan distributors at Toronto, Ottawa, and London, Ontario and the Lewis Electrical Supply Company a co-distributor with the New England Distributing Co., in the Boston territory. Homer C. Davis Co. has become exclusive distributor in the Philadelphia territory.

Stewart-Warner Radio Corp. has appointed Lindsay-Nicholson, Inc., Washington, D. C., as radio distributors for that territory.

Supreme Instruments Corp. of Greenwood, Miss., have appointed a number of new district representatives to coöperate with dealers and distributors. These are James P. Hermans Co., 585 Mission Street, San Francisco, Calif.; Los Angeles branch, 224 E. Sixteenth Street; James J. Backer Co., 106 Denny Way, Seattle, Wash.; Southern Sellers, 918 Union Street, New Orleans, La.; Electrical Apparatus Sales Co., 10 High Street, Boston, Mass.; Bruce O. Burlingame, 130 W. Forty-second Street, New York City; J. E. Sheldon, care of Radio Experimenters Service Bureau, Claremont, Va.; Frank A. Baumgarten, 422 Penn Avenue, Pittsburgh, Penn.; W. A. Burke, Charleston, W. Va.

Trav-Ler Mfg. Corp., St. Louis, Mo., is making a new six-tube midget radio set with push-pull electro-dynamic speaker to sell for \$59.50, with tubes. It is designed for all-electric operation

(a-c and d-c models) and has simplified tuning control of a three-gang condenser and sensitivity control. It weighs 20 pounds.

E. Toman & Co., Chicago, are giving publicity to their Super Pick-up as



Toman Super-Pick-up

a producer of extra sales and profits for radio dealers.

John C. Tully, Chicago, has resigned as president of the Steinite Radio Company and its subsidiaries and Arthur T. Haugh, Rochester, N. Y., has resigned as general manager of the entire Steinite group and as vice-president of Steinite Mfg. Company. The two accepted the command of Steinite less than two months ago when Steinite creditors, including the banks, selected them to rescue the then badly involved concern. At the time Messrs. Tully and Haugh began their rescue work, it is understood, certain promises were made which they considered essential for Steinite's rejuvenation. Their plans for rejuvenation actually got under way, but their completion was blocked when certain promises were not fulfilled.

Utah Radio Products Co. of Chicago is selling the new Utah automatic remote control device to three prominent radio set manufacturers who have adopted it for their forthcoming models. Negotiations for its use are being made with a score of other manufacturers. In addition to tuning to pre-selected stations, this device enables the user to "fish" for other stations and to control the volume.

Van Horne Tube Co. sales are under the direction of J. L. Leban, vice-president and general manager. The company supplies an individually plotted characteristic curve with each tube that is sold, thus furnishing a certified tube to the purchaser.

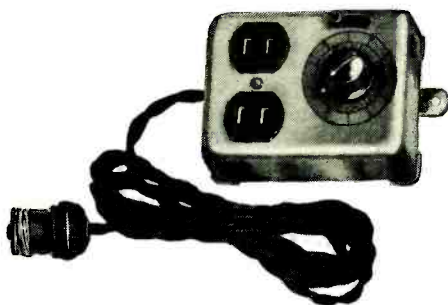
Workrite Radio Corp., Cleveland, Ohio is making the Walker Flexi-Unit which, in connection with the proper plug-in coil, may be used as a one-tube receiver of short-wave or long-wave



George W. Walker Flexi-Unit

broadcasts (15 to 550 meters), a short-wave adapter, an r-f pre-amplifier, an r-f oscillator, a wave trap or a wave meter. It is built in an aluminum case fitted with binding posts which permit of the various uses for which the unit is designed. A series of three adapter-plugs enable it to be used with receivers which have '01A, '27 or '24 type tubes.

X-L Laboratories, Chicago, Ill., an-



X-L Sentinel

nounces the "Sentinel" as a new device for automatically turning off a radio set.

Zaney-Gill Corporation of Los Angeles have started production on a new six-tube Clarion Midget with electro-dynamic speaker to retail at \$49.50, less tubes.

Zenith Radio Corp. has formed the Zenith Radio Distributing Corp. to handle its wholesale business in Chicago.

New Service Managers Group

Pacific Radio Trade Association is considering the organization of a service managers group to give examinations and certify to the ability of service men who join the Association's radio technician group. Each man who qualifies would be furnished a monthly card bearing his picture and the name of his employer. Weekly lectures would be given to keep members informed on the new improvements. The idea is further to establish a uniform service charge by the dealer and greater compensation for the service man and to conduct an advertising campaign to acquaint the public with the fact that the Association guarantees the work done by its members.

DEMONSTRATION COSTS

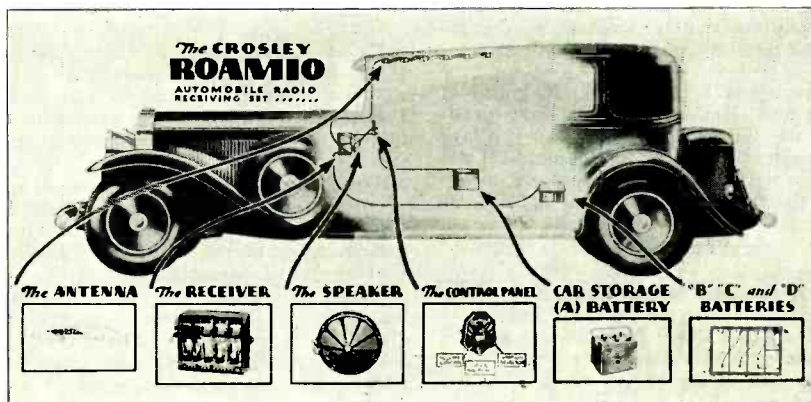
It costs \$4.51 to sell a radio receiver, but the dealer is in the hole to the extent of \$13.43 if the sale is not carried through. These seemingly anomalous figures are the result of an investigation by the Department of Commerce of sales conditions in the radio field.

The sales cost of the receiver is based, of course, on the time consumed by the salesman in demonstrating the model, but the high expense of a sales failure include the delivery and pick-up and a reconditioning of the apparatus for the next demonstration.

Crosley Sees Big Demand for Auto Radio

Powel Crosley, Jr., confidently expects a big demand for automobile radios from millions of car owners. The picture shows how the Roamio set can be installed in a car by a mechanic after a dealer has sold it. The price is \$75, exclusive of tubes and installation cost. It has automatic volume control to compensate for variation in signal strength in traveling from place to place, and is exceedingly rugged and compact.

If the car is not equipped with an aerial, it is possible to use the wire netting in the roof or a section of copper screen about 2 by 3 ft. Or insulated wire may be run back and forth across a piece of drill cloth stretched across the roof. The receiver is placed on the engine bulkhead just below the cowl and the controls are mounted on the instrument panel. Special expert aid must be employed to eliminate interference from the automotive electrical system, although some auto manufacturers are now taking care of this matter.



How a Crosley Roamio Is Installed

Radio Pickups

Items of trade interest from here, there and everywhere, concentrated for the hurried reader.

R. M. A. News

The R. M. A. Merchandising Committee, of which Major H. H. Frost is chairman, has the following subjects under consideration: Standardization of manufacturers' policies on freight allowances to jobbers; analysis of manufacturers' cost of distribution; establishment of a central warehouse in Philadelphia; establishment of sales training courses for retail dealers and salesmen; maintenance of mailing lists of dealers and jobbers for use of members; merchandising analysis of country, section by section; establishment of uniform guarantees on various radio products.

Twenty-four radio manufacturers maintain export departments, while ninety-seven use combination export managers, sales factors, and similar export sales agencies. Many requests regarding American radio products are received by the R. M. A. Foreign Trade Committee which recently has been reorganized to become more efficient in developing export trade for members. A governing committee has been appointed by Chairman Pollock. Its members are: Arthur Moss of Electrad, Inc.; A. S. Hughes of the Colin B. Kennedy Corp.; C. J. Hopkins of the Crosley Radio Corporation, and W. J. Avery and L. DeBlock. Various committees to intensively handle export matters also have been appointed, as follows: Advertising, merchandising and patents, Chairman Pollock; tariff, C. J. Hopkins of the Crosley Radio Corporation; traffic and packing, W. E. Batchellor of the Atwater Kent Manufacturing Co.; statistics, Alvar Chaves of the Diamond Electric Corporation; engineering, A. Hautzch of the Best Manufacturing Company; trade shows and expositions, A. S. Hughes of the Colin B. Kennedy Corp.; and credit, N. Simons of M. Simons & Sons Co.

At the annual meeting of the R. M. A. membership in Atlantic City, June 4 and 5, a plan for creation of associate members of the Association with minimum annual dues of \$200 each, will be presented. These will be chosen from companies which manufacture products widely used in the radio industry and which are closely affiliated to the industry but not complete radio products.

New members of the R. M. A. board of directors are: Herbert E. Young, vice-president of the Grigsby-Grunow Co.; J. Clark Coit, president of the U. S. Radio and Television Corp.; and Roger J. Emmert, president of the General Motors Radio Corporation.

Allen-A Moves

Allen-A factories for the manufacture of a new line of licensed radio tubes have been moved from Harrison, N. J., to Lawrence, Mass., the general sales offices being maintained at 525 Broadway, New York City. Henri Sadacca has been elected president and Walter J. McMahon sales manager.

N. F. R. A. News

National Federation of Radio Associations plans publication of a comprehensive booklet on the examination, registration and grading of radio servicemen. It will include samples of questions, application blanks, rating cards, grade cards, etc.

R. W. A. News

The Traffic Committee of the Radio Wholesalers Association, under the direction of F. E. Stern of Hartford, Connecticut, as chairman, in cooperation with the Traffic Committee of the Radio Manufacturers Association, B. J. Grigsby, chairman, has secured a revision in freight rates on radio receiving sets and talking machines, effective June 15. This will make an estimated saving of over a million dollars annually, being 10 per cent less than former rates.

Radio Wholesalers Association has discontinued the Accessories Committee "inasmuch as accessories are not now playing as large a part in the wholesaler's place of business as formerly."

Westinghouse Radio Distributors

Westinghouse Electric and Manufacturing Company announces that the distribution of its new radio sets, in which superheterodyne models will be featured, will be under the direction of M. C. Rypinski as manager of the radio department, with Lewis M. Clement as his assistant, responsible for commercial engineering, service, etc.; Frank E. Eldridge as assistant responsible for business with the government, and Le Roy W. Staunton as assistant responsible for advertising and sales-promotion. C. Hart Collins is merchandising manager, with Ralph B. Austrian and John A. Duncan as assistants. Distribution will be through Westinghouse agent-jobbers.

New Radio Catalogs

DeJur-Amsco Corp. of New York City illustrate and describe heavy duty rheostats and potentiometers, 40 and 75 watt, in a new four-page pamphlet. These are intended for talking movies and other sound-reproducing systems.

The Radio Manufacturers Association have published a bulletin on "Radio in the Motor Car," wherein are digested the facts brought out during a hearing before the Public Works Commission of Massachusetts.

National Carbon Co. is distributing a series of service bulletins concerning the Eveready Raytheon tube. The first is a chart which gives dimensional data, normal electrical characteristics for specified normal operating conditions, and types of service for which various tubes may be used.

Sleeper Remote Control

Sleeper Research Corporation, New York City, are making the Kinematic Multiple Remote Control unit. This provides vernier dial tuning, regulates volume, and switches a set on and off wherever it is installed in a dozen or more points throughout a house.



Sleeper Kinematic Multiple Remote Control

The driving mechanism can be easily attached to almost any set, including Grebe, Atwater-Kent, Crosley, Bosch, R. C. A., Howard, National, Philco, Majestic and Colonial. It does not employ relays, circuit breakers, motors, balanced circuits, or other devices which require adjustment or replacement.

Upco Western Stocks

Upco Products Corporation of New York City announce that stocks of the Upco standard, symphony and special pick-up heads, as well as reproducers for mechanical phonographs, are to be carried by F. L. Cook as factory representative at Los Angeles, and by J. A. Nadon at San Francisco.

Shallcross Manufacturing Company, Collingdale, Pa., is making a type "T" resistance which is designed for mounting by means of



Shallcross Wire Wound Resistor

angle bracket or soldering terminals, but not clips. The company is also making a new type of wire-wound resistor with flexible wire terminals and ranging in value up to 100,000 ohms.

National Transformer Manufacturing Company has taken over the Balkeit plant, name and materials, at North Chicago, Ill., and will market one Balkeit chassis and eight private brand chassis, all designed for three screen grid tubes in the r.f. stages and two '45 tubes in push-pull in the last audio stage.

Hammerlund Manufacturing Company, in the d-c model of its Hi-Q 30, is successfully using '45 tubes in push-pull with 110 volts on the plates.

BOOK REVIEWS

"**RADIO DATA CHARTS.**" By R. T. Beatty. 82 pages, 8½ by 11 in. Published by *The Wireless World*, Dorset House, Tudor Street, London, E. C. 4. Price 5 shillings.

The radio designer here has a ready means for solving problems that ordinarily call for complicated formulas and mathematics. This book is an assembly of "straight-line" charts or abacs whereby the answer to any problem connected with the design of a radio receiver can be quickly and easily found. Each of the 35 charts is accompanied by a detailed explanation of how the required factor can be found from known quantities. Thus it is possible to find the simple relationship between inductance, capacity and frequency, how to design high frequency transformers, or how to estimate the gain given by various types of couplings.

"**CONFIDENTIAL DEALERS' SERVICE.**" 120 loose-leaf sheets, 8½ by 11 in. in three-ring binder. Published by Radio Dealers' Association of America, Inc., New York City. Subscription price \$25 a year.

This is primarily a compilation of suggested appraisals for allowances on trade-ins. It covers all standard receivers which have been made since 1922, giving list prices, identifying specifications, and appraisals of all except current models. It is accompanied with a copy of Rider's "Trouble Shooter's Manual" and is to be supplemented with new information from time to time. It also contains specifications for loudspeakers, phonographs, pick-ups, motors and turntables, tubes and radio furniture. It is the most complete and comprehensive service of its kind which has yet been published.

"**AUDIO POWER AMPLIFIERS,**" by J. E. Anderson and Herman Bernard, 195 pp., 5 by 8 in., published by Hennessy Radio Publications Corp., New York City. Price \$3.50.

This is a practical manual on the design, construction and servicing of equipment for producing large undistorted output from radio sets and phonograph pick-up units, whether operated from batteries, d-c or a-c lighting circuits. After a preliminary discussion of general principles, the authors explain the fundamental laws of electrical circuits and the principles and characteristics of various types of rectifiers. They then take up several problems in voltage dividers, including also means for obtaining grid bias. The principles of the push-pull amplifier, the cause and cure of oscillation, and the characteristics of tubes are explained in detail. The chapter on record reproduction is particularly complete, as is also that on power detection. The use of these several component parts in different forms of practical power amplifiers is fully described. The book is concluded with a chapter on measurements and testing. This little book is filled with valuable information which is somewhat difficult to pick out without reading every line. It would be greatly improved by the addition of an index. But nevertheless it is of great value to the man who handles this kind of equipment.

"**STORAGE BATTERIES,**" by G. W. Vinal, 427 pp., 6 by 9 in., published by John Wiley & Sons, New York City. Price \$5.

Notwithstanding the popularity of the a-c receiver, there are still so many storage batteries used in radio that it behooves the radio man to be fully informed about them. All that he needs to know, and more, may be found in this comprehensive text which has been re-written and re-set for a second

edition. About one-third of the book is concerned with the materials which are used in making batteries, half of this space being devoted to electrolytes, including those "special" ones which cannot be recommended. Succeeding chapters are devoted to the theory of the reactions and energy transformations which take place in different kinds of batteries, a discussion of the factors which determine the capacity and rating of a cell, resistance and efficiency tests. The most practical and useful information is found in the chapter on operation wherein various charging methods and equipment are described, together with complete directions for overcoming all sorts of troubles. The concluding chapter describes the various industrial applications of storage batteries. While the theoretical portions are somewhat technical, they in no way detract from the usefulness of the book to any man who wants to know more about this interesting subject.

"**ENGINE-IGNITION SHIELDING FOR RADIO RECEPTION IN AIRCRAFT.**" By H. Diamond and F. G. Gardiner. Research Paper No. 158, U. S. Bureau of Standards. Price 15 cents. Gives details of methods employed to prevent interference from ignition systems without causing faulty ignition.

THEORY OF RADIO COMMUNICATION. By John T. Filgate, 250 pp., 6 by 9 in. Published by Radio Design Publishing Co., 103 Broadway, Brooklyn, N. Y. Price, \$2.00.

Lieutenant Filgate is instructor in communication engineering at the U. S. Army Signal School, and in this text embodies his ideas as to how radio should be taught to his students who are already familiar with the elementary principles of electricity and magnetism. As these students are primarily interested in the operation of transmitters and receivers, the subject is presented so as to familiarize them with such work and at the same time keep up with subsequent improvements in the art. The man who really wants to understand the principles which underlie the operation of all kinds of radio equipment will find that this text is particularly well adapted for self-study. This object is greatly aided by a summary and list of questions for self-examination at the end of each chapter. Simple mathematics is sparingly used in explaining such things as vacuum tube characteristics. It makes no pretense of being a manual for troubleshooters, and yet it tells things that every trouble-shooter ought to know in order that he may work intelligently.

NEW RADIO CATALOGS

Electrad, Inc., of New York City, has issued a pamphlet giving directions for the assembly and operation of the Loftin-White amplifier in combination with a specially designed one-tube r-f tuner. It will be sent upon request.

Aerial Insulator Co., Green Bay, Wis., have published a list of towns where power companies regulate their current for operation of synchronous electric clocks, such as the Solar, which is equipped with a radio antenna.

Cable Tube Corp. has published several leaflets for dealer distribution to customers. These include a list of the tube requirements for different standard receivers, an illustrated price list and specifications of sixteen types of Speed tubes, a miniature encyclopedia of information about radio programs, and a chart for locating broadcast stations on a tuning dial.

The Sylvania Business Book from the Sylvania Products Co. of Emporium, Pa., contains merchandising information of interest and value to dealers who sell tubes and lamps.

The Eisler Electric Corp. of Newark, N. J., has recently issued a new 136-page catalog containing over 700 illustrations of various types of machines employed in the manufacture of radio tubes, television tubes, neon sign tubes, incandescent lamps and glass products.

"**POLYMET ENGINEERING MANUAL**" from the Polymet Mfg. Corp. of New York City contains many suggestions for obtaining the best results from the least expenditure in the use of paper and mica condensers, resistors, coils, volume controls, magnet wire, and similar parts.

SHORT-WAVE RADIO

(Continued from Page 37)

where no broadcasts can be heard. Each of the six broadcast bands occupy narrow spaces on the tuning dial. Between these spaces many code stations can be heard, amateurs around 80, 40 and 20 meters, and commercial or government stations elsewhere. Once the user becomes familiar with tuning his set he acquires an almost irresistible desire to learn the International Morse Code so that he can understand the messages or at least learn what and from where he is hearing.

In discussing the various short-wave receivers which are now on the market, reference is made only to a few of the complete factory-built models which the dealer can carry in stock, and not to the various excellent kits or adapters which can be assembled by the service man and sold. With few exceptions these sets depend upon regeneration for their sensitivity, thus adding one more difficulty while tuning, it being necessary to operate just under oscillation. No manufacturer has yet designed a set exclusively for short-wave broadcast reception, as could readily be done with about five sets of coils and a condenser designed to cover only the broadcast frequencies in each broadcast band. On the other hand the present short-wave sets have the advantage of bringing both code and music-voice.

Some of the other factory-built short-wave outfits which are not illustrated herewith include the National Thrill Box (battery-operated), the C. R. Leutz Units, the Hatry & Young 6-tube short-wave superheterodyne, and the Aero short-wave tuning unit for which plug-in coils are not necessary to tune a wide range of wave-lengths.

TOBE Filterette

JUNE, 1930

TOBE INTERFERENCE POLL DISCLOSES TREMENDOUS ACTIVITY

Uncounted Number of Cities and Towns Passing Ordinances

TO ATTEMPT to enumerate, as was possible a few months back, the new cities and towns which are passing radio ordinances would today be an impossibility. Statistics and questionnaire data brought to the offices of the corporation at Canton, Massachusetts, as well as the actual activity which has been brought about as a direct result of this corporation's agitation for better radio reception, show that this movement has gained the momentum which will put it over the top by next winter. In other words, by that time, we believe, radio interference elimination will be a subject of such common knowledge that no one would think of walking into a store to purchase an electrical appliance without first demanding, "Does it interfere with the radio?"

We base this prophecy on more than mere optimism. Within the past two weeks the Electrolux Refrigerator Company, in half-page newspaper advertisements throughout the country, have made a bold stroke to cash in on one hitherto almost ignored feature of their refrigerator. "Electrolux," their ad reads, "can never interfere with your radio."

In order to answer the demands which the public will now make as a result of this advertisement, manufacturers of other makes of refrigerator must be able to meet this challenge by saying, "Neither does our refrigerator." And they are already turning to Tobe for means to accomplish this.

But this is not all. The Gilbert and Barker Company, a subsidiary of the Standard Oil Company, and makers of perhaps 95 per cent of the filling-station

(Continued on Page 94)



INCREASE YOUR SALES WITH THIS NEW STICKER

The above facsimile, actual size, shows the new Tobe sticker which is being distributed on request to all those who are interested in waging war on radio interference.

Write today for your supply of these striking labels. Attach them to your correspondence, your bills, your own circulars and watch the interference in your district gradually disappear.

ISN'T IT SO?

One reason why this Filterette business continues to grow by leaps and bounds can be found in the clipping below. The italics are ours.

It is said that the census question about the possession of a radio outfit frightened a good many people who thought that they were going to be taxed on their set, but the "Man about Town" of the Fall River *Herald News* says it was just the other way in Fall River. "The moment radio was mentioned every householder wanted to talk radio. He had either the best radio or the worst set in the neighborhood. He wanted to talk of the treats he gets every night, or he wanted to tell about all the bother he was getting from it. He spoke of the folks upstairs who were 'kicking about it.' He told about his payments on it, and how soon he expected it would be all paid for. He discussed music and jazz with the enumerator and went all over the Hoover speech with him. He talked McCormack, Galli-Curci and Roxy with him, and he wouldn't let him go until he sat and listened half an hour to WBZD."

TOBE INTERFERENCE CAM- PAIGN DRAWS OFFICIAL VISITS

AS A RESULT of the tremendous agitation started for the elimination of radio interference by the Tobe Campaign, visitors have been flocking to the headquarters of the campaign in Canton, Massachusetts, both to express personal support of the movement, and to gather data for the better prosecution of the campaign in their own districts.

Among the first to visit the plant and laboratory was F. G. Strong, an official of the Long Branch Chapter of the Radio and Music Trades Association of Southern California. A conversation with Mr. Strong disclosed facts of such importance to radio interference campaign workers that it has seemed advisable to summarize them here.

Practically every town in Southern California has a radio ordinance. The work of radio interference location, and the prescribing of preventive measures is being done under the direction of the Radio and Music Trades Association of Southern California, which is bidding for the support of all who benefit by a reduction of interference. It is hoped that ultimately support, both financial and otherwise, rendered by power companies, public utility corporations, street car and traction lines, radio dealers, jobbers, and amateur organizations may be forthcoming. Some of those interested in the movement, it is said, are already contributing sums as high as \$400 monthly.

Of course the advantages of having all trouble-shooting done by one organization are readily apparent. To begin with, duplication is avoided, as are needless visits from the power company's crew which formerly had to chase down every complaint, despite the fact that it has been shown that only 11 per cent of radio interference is caused by factors

(Continued on Page 95)

Radio Interference Produced by Street Cars

By M. A. SIMMONS

Engineer, Tobe Engineering Survey

IT SHOULD be stated at the outset of this article that, while it is entirely possible for traction companies to eliminate radio interference from their cars, the corrective and preventive measures available to the listener are limited. We shall, therefore, outline briefly, before taking up the subject of filtering the car itself, such methods as may be employed by a listener who is annoyed by radio interference in a district where the traction company either refuses to adopt preventive measures or has not yet adopted them.

The first experiment which should be tried (provided that it has not already been done) is to erect an antenna at right angles to the trolley wire and with a shielded lead-in attached to the antenna at the point farthest from the trolley wire. By thus utilizing, so far as is possible, the directional characteristics of the antenna, interference from the trolley wire is reduced to minimum signal strength, since the antenna is now at a right angle to the field of interference from the trolley wire. Shortening the length of the antenna to reduce overall signal strength, erecting a higher antenna, shortening its effective length by means of a .0001 to .0005 fixed or variable condenser, changing grounds, or using a separate ground—all these may help. In some instances the use of a line filter at the power input to the radio set has afforded relief. For this purpose either the Tobe Filterette Senior or the 110 P. O. is suitable.

To date, however, the cure suggested by Sam Curtis of Boston, whose technical knowledge of radio engineering is exceeded only by his wit, is the most effective so far discovered. It is simply, "Move."

It is entirely possible, however, that the traction company in the reader's neighborhood may be open to suggestion, and in this connection would be interested in learning some of the methods employed in removing interference from their rolling stock.

We wish at this point to make acknowledgment to the Milwaukee Street Railway Company, who have done outstanding research on this problem. It was through coöperation with this company that the writer, M. A. Simmons, was enabled to obtain some of the data herein reproduced. Other experiments had been previously tried in Houghton, Michigan, with considerable success.

The sources of radio interference

caused by street cars in Houghton were in general three:

First: The stop-signal buzzers on each car.

Second: The opening and closing of controllers, and motor operation.

Third: Radiation set up by static discharge between the trolley wire and the trolley wheel, and wheel and rail contacts.

The intensity of the interference experienced from street cars is due, of course, to the fact that any spark at these various points finds already waiting an ideal transmitting antenna in the form of miles of trolley wire, provided that the radiation resistance is favorable. And since in unfiltered cars there is nothing to stop the radio or audio frequency signal from traveling directly to this trolley-wire antenna, it generally takes that path.

The interference from the buzzers, of which there are as a rule two, one at either end of the car, is readily suppressed by the application of a Tobe Filterette No. 601F across the two buzzer leads right at the buzzer. To those who are not familiar with the Tobe line we shall explain that the initial six denotes a 600-volt rating, the voltage used on the ordinary street-car system (Fig. 1).

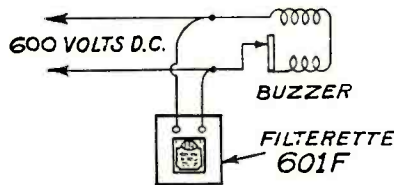


Fig. 1. Application of Tobe Filterette to Stop Interference from Buzzers

The second source of interference is the sparking at the brushes and commutator of the driving motors, of which there are usually four, except in cars having only four wheels, when there are two. Under this heading we shall include also the compressor motor, making five motors in all which must be filtered. We shall use for this purpose a

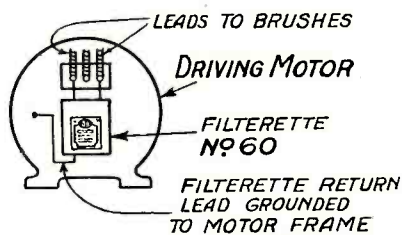


Fig. 2. Application of Tobe Filterette to Stop Interference from Motors

Tobe Filterette No. 60, connected across the brushes with the extra lead grounded to the frame of the motor (Fig. 2). It is essential that the filterettes be mounted on the motor frame itself, beneath the car, and that all leads be kept as short as possible. It should be remembered in all filterette installations that it is essential that frame connections be cleaned so as to provide a low resistance return path.

Filterette No. 60 should also be installed across the brush leads to the compressor motor (Fig. 2).

We come now to one of the most interesting features of street-car interference. The Milwaukee Street Railway Company studied the causes of radio interference from the trolley wire under the microscope in order to establish their findings. Their reason for going to such an apparent extreme was this: In making their tests, they discovered that, even with the motors entirely shut off, the radio set used still continued to pick up a steady scratching, sputtering sound, when the car was allowed to coast under its own momentum. Investigation disclosed that the arcing between the trolley and the wheel caused an intense heat which melted the undersurface of the trolley wire, drawing it down into infinitesimal stalactites. This surface condition was found to be more noticeable on double-track routes, where the cars nominally traveled in only one direction. On single-track routes, where the cars traveled in either direction, the pull of trolley wheels going in opposite directions tended to neutralize the effect, for when the wire surface had been pulled in one direction by the melting caused by arcing, a second car following shortly after and going in the opposite direction would of course melt and pull the surface in the opposite direction, thus tending to undo the effect caused by the previous car.

The first experiment resorted to by the company was to fasten a "shoe" in place of the wheel, and this device, illustrated in Fig. 3, was found to give even

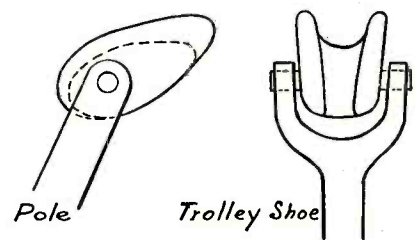


Fig. 3. Shoe for Reducing Interference from Trolley

better results than the expedient of fastening the wheel and using it as a shoe, which was tried by another company which was working on the problem. For a month or so this seemed to have solved the problem. Gradually, however, the interference was found to be returning, until finally it was as bad as, if not worse, than ever. A second microscopic examination disclosed that the surface melting process was going on as before except that this time the particles were globular instead of pointed, as formerly.

An experiment of greasing the entire length of the trolley wire with a composition of graphite and hard grease was then tried. This was found to remove completely all remaining traces of interference.

The problem, however, was not yet solved. It was discovered that a coating of the grease used would lose its effectiveness in the space of twenty-four hours, necessitating renewing of the grease daily. After further experiments with different types of compositions, a grease was finally hit upon which needed renewing only every forty days. At the present time, engineers of the company are at work upon a type of continuous lubricating trolley shoe which will automatically grease the wire as the car moves along. It may be interesting to note, in this connection, that the company reports a saving of 60 per cent on depreciation of trolley wire where the greasing system is used.

There still remained one more source of interference. A phenomenon similar to what has been described as occurring at the wheel and trolley, takes place also at the carriage wheels and tracks or rails. This sparking is aggravated, moreover, by the use of sand as protection against slipping as well as the normal residue of dust, leaves, etc., blown onto the tracks from the traffic in the streets. In this latter instance it is manifestly not possible to grease the rails as it is the trolley. Another expedient was therefore resorted to which effectively removed the last traces of interference from the car.

On street cars having a single trolley pole, which is reversible to suit the direction in which the car is to run, this interference was found to cause no trouble. On cars equipped with double trolley poles, however, one at each end of the car, the interference was picked up. Investigation disclosed the source of the trouble. While both types of cars had a choke coil (approximately fifty turns) between the trolley pole and the line to the controller-switch boxes, in the two-trolley pole type the trolley bus bar, which runs the length of the car and connects the trolleys at either end, was found to be picking up this interference inductively from the feeder bus, which parallels it, running from the

switch box on one end to the switch box on the other. The single-pole trolley car, in which this type of parallel wiring is not found, did not for this reason give off this type of interference because the choke coil alone was adequate to filterize the line power trolley pole to controller cut-out switch.

In order to destroy the inductive pick-up in the double-trolley pole type of car, the choke coil which connected the feeder bus and the trolley bus was removed and a coil of identical type was installed at the output of each cut-out box. This was found to remove the balance of interference (Fig. 4).

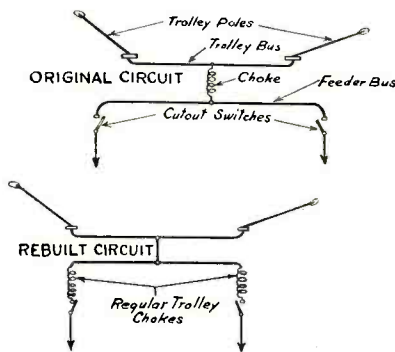


Fig. 4. Original and Rebuilt Trolley Circuit for Stopping Interference

A word should be included about the bonding of street-car rails. It is unnecessary to reiterate here the necessity for proper bonding of all joints. Reliance on the fish-plates which hold the separate rails together is highly inadvisable, both from the standpoint of radio interference and from that of avoidance of power leakage. Rails should be thoroughly connected together with a welded bond. The loss of power occasioned by leakage is only one factor to be weighed. The current, seeking a low-resistance path, may, if water pipes lie below the street surface, travel along these pipes, causing disintegration of the pipes through electrolysis.

The methods described above have been used successfully by the Milwaukee Street Railway, and have since been adopted by several western traction companies. They are at present being tried out in La Crosse, Wisconsin, and will doubtless be taken up by other cities and towns when the advantages of the method are appreciated by traction engineers.

TOBE INTERFERENCE POLL

(Continued from Page 92)

pumps used throughout the world, last week broke publicity on a new oil burner, equipped with Tobe Filterette, and advertised, "It will not interfere with your Radio."

So many highlights of the campaign crowd the writer's mind for expression

that it is difficult to select from them all those most calculated to interest the reader. Let us select at random from some of the thousands of reports, questionnaires, clippings, mailing cards, etc., which have required putting on extra girls just to handle this work alone.

One of the first which comes to hand is a letter from W. A. Jacoby, a radio interference engineer who is in charge of a special department of the Indianapolis *Star*, a progressive newspaper which is waging a war on this evil. Mr. Jacoby encloses two cards, which read as follows:

Mr. _____
The Indianapolis Star Radio Interference Department is now working in this section to clear your interference. Will you let your neighbors know, since many have written to us about this trouble. If you have any questions to ask about your trouble call the department in the evening between 8:00 and 9:00 o'clock.

W. A. JACOBY,
Radio Interference Engineer.

Mr. _____
The Indianapolis Star Radio Interference Department has received your letter, and will be in your section to check on your troubles soon. Please keep in touch with this department by calling in the evening on the phone, Riley 7311, from 8:00 to 9:00 o'clock. We can then tell you just what steps are being made to clear your interference.

We would like you to call or write us when the trouble has been cleared, and tell us if all the interference has been eliminated.

Yours truly,
W. A. JACOBY,
Radio Interference Engineer.

There is also a petition, blanks for which are presumably sent out by the *Star*, and which may be sent to each complainant, who is invited to obtain as many signatures as possible. The blank reads:

TO THE CITY COUNCIL OF INDIANAPOLIS:

We, the undersigned residents of the city of Indianapolis, owners and operators of radio receiving sets, heartily endorse and petition the passage by the City Council of an ordinance prohibiting any person or persons from willfully creating unnecessary radio interference through the use of electrical equipment, or limiting its use to specified hours; also prohibiting the use of high frequency machines, electric signs, etc., that are not equipped with interference filters during the evening hours.

NAME ADDRESS MAKE OF RADIO

Here is a method which can be used in your own community. Why not see whether you can adopt this method through the coöperation of your own local newspaper. Any forward-looking editor should be glad to assist in so worthy a project, and in order to do our part in helping your cause along, this corporation will be glad to send, free of charge, a copy of the Tobe manual, "Radio Noises and Their Cure," to the editor in your town. Just send us his name and we will keep him informed of radio interference developments.

INTERFERENCE CAMPAIGN

(Continued from Page 92)

over which the power company has any control. The benefit to radio dealers, also, has been a very real one, since the ability to remove radio interference often decides a sale.

Kenneth Hathaway, associate radio editor of the *Chicago Daily News*, was another enthusiastic visitor to the Corporation offices this month. He was frankly surprised, he said, at the work which is being done, especially the bulletins on the campaign which are sent out three times a week. It was suggested that by the time the *Literary Digest* had finished with the prohibition poll, the hour would just about be ripe for a poll of the country to ascertain how many cities and towns had already adopted radio interference ordinances.

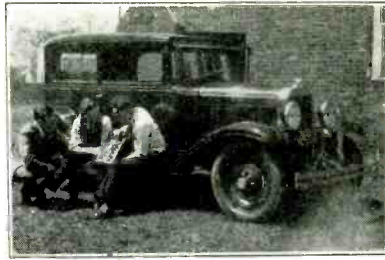
Mr. Hathaway was very enthusiastic on the subject of automobile radio, for which he believes there is a great future, it being the ideal summer item for which radio dealers have been waiting. He was very much interested in the Tobe ignition filterette kits, having already installed a radio set in his own car from which he had been unable entirely to eliminate the ignition interference. A few minutes' examination disclosed the cause of the interference, and a Tobe ignition filterette soon quelled the remaining noise, to the great delight of Mr. Hathaway, who uses the radio constantly on long trips to break up the monotony of the interminable stretches of lonely driving. As the picture on this page shows, the interference locator also occupied his attention, and he returned to Chicago full of enthusiasm for the future of the Corporation.

Still another visitor was H. G. Blankman of Alaska, who evinced great interest in the progress which was being made on all sides. He expressed great pleasure at being able to witness in person many of the things which he had read about in the *Filterette Magazine*. We urge any of our readers who have the opportunity, to emulate Mr. Blankman and pay a visit to the laboratory and offices at Canton, Massachusetts. We can assure you your time will be well spent.

REPORT ON LOCAL RADIO RECEPTION

(Continued from May RADIO)

Classification E—Sometimes the interference heard on a radio is directly traceable to the set or its wiring although other outside interference may be present. Several such cases were found. A close inspection revealed the fact that the small flexible wire used for lead-ins was corroded inside of the rubber insulation, and many of the strands broken.



MM! MM! AIN'T THAT SUMP'N?

Seated on the running board of one of the new Tobe fleet of Radio Interference Survey Cars, M. A. Simmons, Tobe Engineer (with headphones) is shown explaining the workings of the Tobe Interference Locator to Kenneth Hathaway, of the Chicago Daily News Radio Department, while J. H. S. Moynahan, Filterette Editor, looks on.

This caused a bad scratching noise and made the reception weaken suddenly. A slight change in the method of connecting the antenna to the set also improved reception. It is with some surprise that I have noted the large number of ball type antennas in use. This type is all right for cities where a number of broadcasting stations are located: however, for this section of the country, located so far from any stations, they are not advisable. Instead, an antenna of 100 feet plus lead-in is to be preferred. This will increase the amount of energy collected, with an increase in signal strength. Selectivity is not the main requirement here. Connecting the antenna to the "short antenna" post of the set will have the same effect where a longer antenna cannot be put up. Sometimes connecting the ground wire to the antenna post and using no antenna will improve results. Connect ground to street-side of water meter. Antenna direction has considerable effect and should be tried in different directions for best results. Poor tubes, loose volume control, poor socket

contacts, shorted lightning arresters, poor grounding, unbalanced tuning, and squeaking, are all sources of individual interference.

Classification F—Interference from the various mines in this vicinity is due entirely to the use of certain d-c electric motors and generators. That from the Hartford Mine was very bad, because the interference was being fed back into the city lines and thus into sets in about half of the city. The installation of a Tobe Filterette on the d-c generator stopped this particular interference; however, there are two pump motors that will have to be throttled with Filterettes before the interference from the Hartford Mine is cleared up. Some interference from the same type machines exists in sections near the Maas Mine, but it is not being carried out into the city lines. Installation of a Filterette on their d-c generators will clear noise at that end of the city.

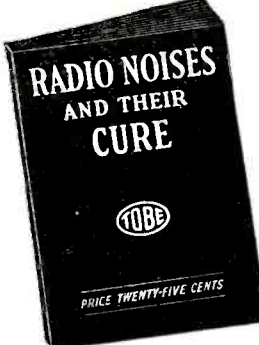
General Recommendations

1. Thorough inspection and repair of all known and suspected defects on C. C. I. high tension lines as discussed with Mr. Sanford.

2. Installation of proper switching controls and splitting up of circuits of city to provide proper power regulation and distribution. Changing of all old type cutouts to new type. Installation of regulators to provide proper voltage control and prevent line bumps caused by changing loads at mines. Installation of bracket type street lamps to eliminate swinging lamps as now used. Installation of a completely grounded system. Cutting out of all tree branches interfering with clear passing of wires. Eventual rewiring of all very old house wiring, and the installation of a polarized ground system. Installation of proper Filterettes as given in an appended list on all motors creating interference. The use of a trouble finder device on city lines. The keeping of the same men, year in and year out, who are now thoroughly familiar with the city power work, regardless of any political changes. And finally, a constant and earnest effort by all concerned to keep the lines cleared, once they have been straightened out.

The use of violet ray massagers creates a very heavy radio interference. The ordinary type Filterette will not stop the radiation of the disturbance; it requires the use of a special Filterette plus a high frequency screen. This is too costly for home use. X-ray machines come under the same classification. Hospitals using x-ray machines to a large extent, generally install the necessary filters and screens. Persons using the violet ray devices should do so at times when it will not interfere with general radio reception.

\$100,000.00



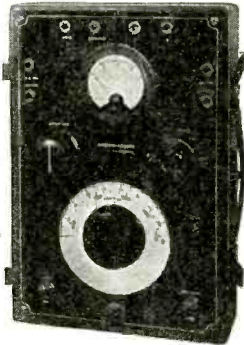
was spent in research to give you this book. It's yours for the cost of printing and mailing —25c post-paid.

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*Tests All Tubes—
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Grid Dip Meter

is necessary for prompt and efficient service on radio receivers

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COMPLETE TEST
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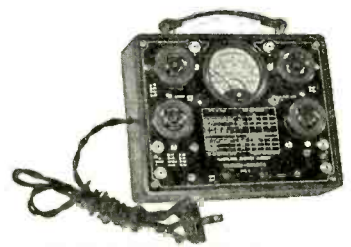
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REASONABLY PRICED**

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Booth B-38

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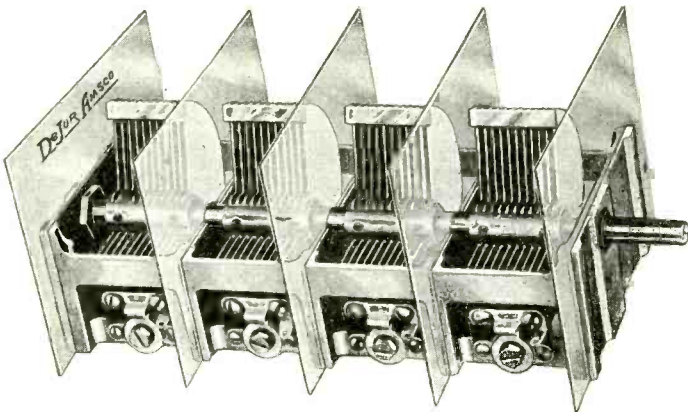
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Write us for engineering data and complete specifications for our new condenser. Samples on request.

Available in Double, Triple, Quadruple and Five Gangs

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by Corning Glass Works



The world's largest manufacturer
of Technical Glassware

Standard PYREX Radio Insulators PYREX ANTENNA INSULATORS



	Broadcast Reception Insulators	Amateur Transmitting	Strain Insulator
Number	67007	67017	67021
Length (overall)	3 3/8 in.	7 1/4 in.	12 1/4 in.
Developed leakage path	3 1/8 in.	6 in.	11 1/8 in.
Average flashover value (Kv.)	Wet 22.5	32	84
Average flashover value (Kv.)	Dry 38	75	124
Weight	3 oz.	13 1/2 oz.	1 lb., 14 oz.
Strength	450 lb.	1,000 lb.	1,000 lb.
Suitable for powers up to		250 watts	1 1/2 kw.
Price, each	\$0.30	\$1.50	\$3.50
Packing	One in carton 12 in display box 12 display boxes in case	One in carton 36 cartons in case	12 in case

Galvanized Shackles, complete, one for each end (extra) \$1.00

PYREX STAND-OFF INSULATOR— CORRUGATED

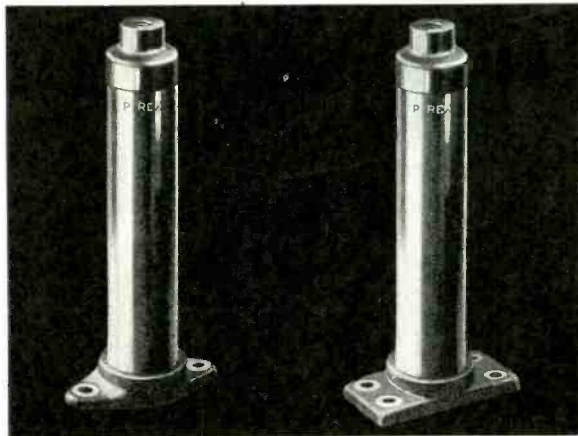


No.	Base*	Outside Diameter of PYREX Part	Height Overall	Wgt.
67027	3/4 in.	1 1/8 in. to 2 1/8 in.	12 1/4 in.	5 1/2 lb.

Tapped Hole in Cap	Average Flashover Value (Kv.)	Devel- oped Leakg. Path	Price Each
3/8 in.—16th	Wet 57 Dry 97.5	10 1/2 in.	\$8.00

*Four holes 9/32-inch on 3/8-inch bolt circle.

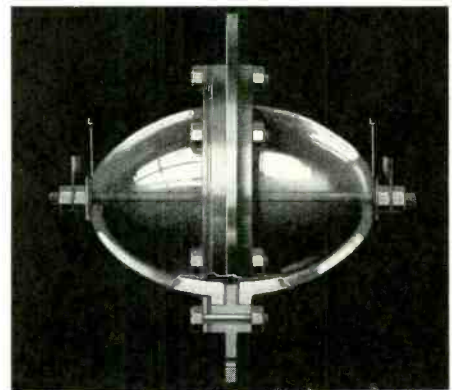
PYREX STAND-OFF INSULATORS—TYPE SE-2190



Oval base—two 9/32-in. holes 2 1/8-in. centers; Rectangular base—four 9/32-in. holes 1-inch and 2 1/4-inch centers.

Number	67018	67019	67068	67069
Height overall	3 in.	7 in.	3 in.	7 in.
Oval base, brass overall	3 1/8-in. x 1 1/8-in.		3 1/8-in. x 1 1/8-in.	
Rectangular base, brass, overall	2 7/8-in. x 1 1/8-in.			
Tapped hole in brass cap	3/8 in.—16 th.	3/8 in.—16 th.	3/8 in.—16 th.	3/8 in.—16 th.
Diameter (PYREX Part)	1 1/4-in.	1 1/4-in.	1 1/4-in.	1 1/4-in.
Weight	10 oz.	17 oz.	14 oz.	20 oz.
Average flashover value (Kv.), wet	7	32.5	7	32.5
Average flashover value (Kv.), dry	21.5	56	21.5	56
Packing	12 in case	12 in case	12 in case	12 in case
Price, each	\$2.75	\$3.00	\$2.75	\$3.00

PYREX ENTERING INSULATOR— DOUBLE LEAD-IN



No.	Flange†	Outside Diameter PYREX Bowl	Price
67085	12 in.	6 1/8-in.	\$40.50

Weight	L. to L.	Length Overall
20 lb.	9 1/8-in.	11 3/4-in.

This insulator is made up of two Type SE-2202 (No. 67037) Insulators (see Page 98) and brass fittings as shown.

†6 holes 7/8-inch on 10 3/4-inch bolt circle.

Tell them you saw it in RADIO

PYREX BRAND RADIO INSULATORS

PYREX BUS BAR INSULATOR—NAVY TYPE SE-2196



PYREX ENTERING INSULATORS—NAVY TYPES

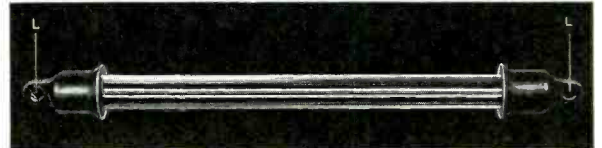
No. _____	67009	67037
Navy Type _____	SE-1846	SE-2202
Weight _____	1 lb. 11 oz.	2 lb.
Height overall _____	4 $\frac{3}{8}$ in.	4 $\frac{3}{8}$ in.
Outside diam. at base _____	6 $\frac{1}{8}$ in.	6 $\frac{1}{8}$ in.
Price, each _____	\$1.50	\$1.50

Type SE-2202 can be furnished with three types of brass fittings and aluminum shield as shown in lower left.



PYREX STRAIN INSULATORS—NAVY TYPE SE-2193

Every Type SE-2193 PYREX Radio Insulator is actually tested to 3,200 pounds pull strain.

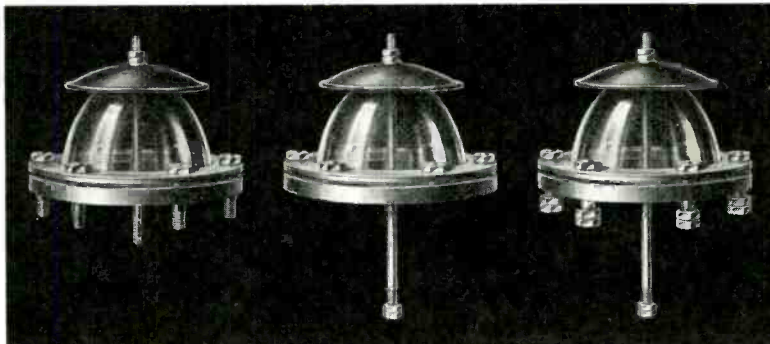


Outside Diameter of Base	Outside Diameter of PYREX Part	Average Flashover Value (Kv.)	Tapped Hole in Cap
4 in.	2 $\frac{1}{2}$ in. to 2 $\frac{61}{64}$	29.5	46.5
			$\frac{3}{8}$ in.—16th

No.	Weight	Height Overall	Price Each
67024	3 lb. 12 oz.	4 $\frac{1}{2}$ in.	\$6.00

Base and cap are brass.

No.	Average Length (L. to L.)	Outside Diameter of PYREX Part	Weight	Developed Leakage Path	Average Flash-over Value (Kv.)	Price Each
67045	12 in.	1 $\frac{1}{8}$ in.	8 lb. 10 oz.	3 $\frac{3}{8}$ in.		\$18.50
67044	16 in.	(same for all Type SE-2193 Insulators)	9 lb. 6 oz.	7 $\frac{7}{8}$ in.		18.50
67043	18 in.		9 lb. 12 oz.	9 $\frac{7}{8}$ in.		18.75
67052	20 in.		10 lb. 2 oz.	11 $\frac{7}{8}$ in.		19.00
67053	22 in.		10 lb. 8 oz.	13 $\frac{3}{8}$ in.		19.50
67046	24 in.		10 lb. 14 oz.	15 $\frac{7}{8}$ in.		20.25
67054	26 in.		11 lb. 4 oz.	17 $\frac{7}{8}$ in.		21.00
67055	28 in.		11 lb. 10 oz.	19 $\frac{7}{8}$ in.		21.75
67008	30 in.		12 lb.	21 $\frac{7}{8}$ in.	129.5	219
67048	32 in.		12 lb. 6 oz.	23 $\frac{3}{8}$ in.		22.50



Type A—No. 67070
\$15.00

Type B—No. 67071
\$16.50

Type C—No. 67076
\$16.50

Average flashover value—Type A—(Kv.), Wet, 27.5; Dry, 43.

All types have flanges 8 $\frac{1}{4}$ -in. diam. with six $\frac{1}{2}$ -in. studs equidistantly spaced on 7 $\frac{3}{8}$ -in. bolt circle, and are approximately 6 in. high from bottom of lower flange to top of center pin. Center pin is $\frac{3}{8}$ -in. in diam., with 16 threads per in. at the ends.

Type A has studs 2 $\frac{7}{8}$ -in. long and 8 $\frac{1}{2}$ -in. center pin.

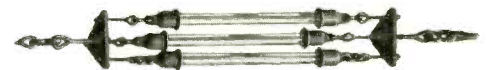
Type B has studs 1 $\frac{7}{8}$ -in. long, 11 $\frac{1}{2}$ -in. center pin and in the bottom flange three equidistantly spaced countersunk 11/32-in. holes on 7 $\frac{7}{8}$ -in. center circle.

Type C is like Type A except that two $\frac{3}{8}$ -in. jamb nuts for the center pin and two $\frac{1}{2}$ -in. nuts for each stud are furnished and the center pin is 11 $\frac{1}{2}$ -in. long.

PYREX PILLAR INSULATORS—NAVY TYPES

Number _____	67059	67060	67061	67065	67062
Navy Type _____	SE-2550	SE-2549	SE-2546	SE-2545	SE-2545
Height, overall _____	2 in.	3 in.	4 in.	6 in.	7 in.
Average outside diam. of PYREX Part _____	$\frac{3}{8}$ in.	$\frac{3}{4}$ in.	1 $\frac{1}{4}$ in.	2 in.	2 in.
Out. dia. of terminal caps (brass) _____	1 in.	1 $\frac{1}{4}$ in.	1 $\frac{7}{8}$ in.	2 $\frac{3}{8}$ in.	2 $\frac{3}{8}$ in.
Developed leakage path _____	1 $\frac{1}{8}$ in.	2 in.	2 $\frac{3}{8}$ in.	4 $\frac{1}{2}$ in.	5 $\frac{1}{2}$ in.
Weight _____	2 $\frac{1}{2}$ oz.	4 $\frac{1}{2}$ oz.	15 oz.	2 lb.	2 lb. 3 oz.
Price, each _____	\$0.90	\$1.15	\$1.65	\$3.40	\$3.75

Special PYREX Pillar Insulators of desired sizes and electrical characteristics for heavy base support, etc., will be made to order.



To distribute heavy strain equally through two or three of these insulators they may be installed between plates as shown.

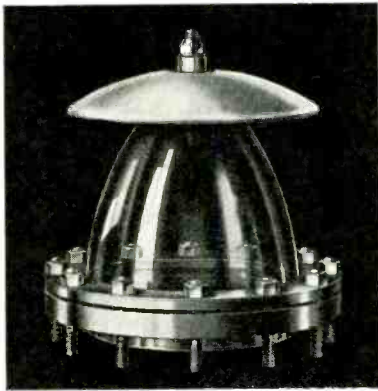


The construction which prevents PYREX Navy Type Strain Insulators from pulling apart under high tension.



PYREX BRAND RADIO INSULATORS

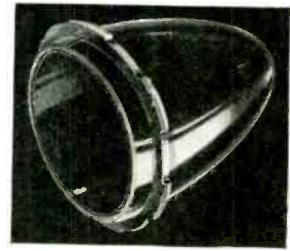
PYREX ENTERING INSULATOR—NAVY DECK TYPE



No. 67042 (at left) is the bowl only.

The mounting has 15 $\frac{7}{8}$ -in. diam. flanges with twelve equidistantly spaced $\frac{3}{8}$ -in. studs on 14 $\frac{3}{8}$ -in. bolt circle. Height from top of center pin to bottom of lower flange 15 in., to bottom of bowl 16 in.

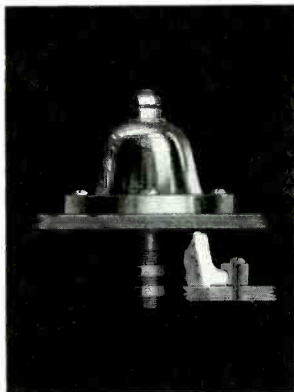
2 KW. PYREX ENTERING INSULATOR



Bowl only	No. 67091
Weight	9 lb.
Height overall	9 $\frac{3}{8}$ -in.
Outside diam. of bowl at base	8 in.
Diam. of flange	9 in.
Thickness of flange	$\frac{1}{8}$ -in.
Price each	\$4.50

No.	Navy Type	Weight	Height Overall	Outside Diameter at Base	Average Flashover Value	Price Each	
					Wet Dry		
67042	SE-2459	16 lb.	13 in.	13 in.	48.5 113	\$ 30.00	
67077	SE-2459	Complete with brass fittings and aluminum shield as shown					157.50
67087	SE-2459	Complete with brass fittings and aluminum shield and 12 additional locknuts					161.25

PYREX ENTERING INSULATORS—AIRPLANE TYPES



67080



67079

Number	67056	67080	67079	67075
Navy Type	SE-2555	SE-2556	SE-2558	SE-2557
Description	(PYREX shell only)	(67056 shell with brass fittings)	(Two 67056 shells with brass fittings)	(Same as 67079 but without guides A)
Outside diameter	2 $\frac{1}{2}$ in.	3 $\frac{1}{4}$ in.	2 $\frac{1}{2}$ in.	2 $\frac{1}{2}$ in.
Overall length	1 $\frac{7}{8}$ in.	4 in.	6 $\frac{7}{8}$ in.	5 $\frac{1}{4}$ in.
Weight	3 oz.	12 oz.	9 oz.	14 oz.
Price, each	\$0.90	\$5.00	\$5.00	\$2.80

Hollow center rod on No. 67079; solid rod with jamb nuts on No. 67075.

TYPES A, B & C ENTERING INSULATORS (BELOW) Specifications

Type A mounting is known also as U. S. Coast Guard Type CGR-37, Drawing R-1030.

All types have 11-in. shield and 14-in. x $\frac{1}{2}$ -in. brass pin with four nuts, 13 U.S.S. threads per in. Top of pin to bottom of bowl, 11 in.

Types A and B have 12 $\frac{3}{8}$ -in. flanges with six equidistantly spaced holes on 11 $\frac{1}{4}$ -in. circle.

Type B has also six equidistantly spaced 17/32-in. countersunk fastening holes on 11 $\frac{1}{4}$ -in. circle in bottom flange.

Type C has 12 $\frac{1}{2}$ -in. flange with six equidistantly spaced $\frac{1}{8}$ -in. counterbored holes on 11 $\frac{1}{4}$ -in. circle in flange. Diam. of shoulder at bottom of flange, 9 $\frac{7}{8}$ in.



Type A, No. 67092
\$67.50

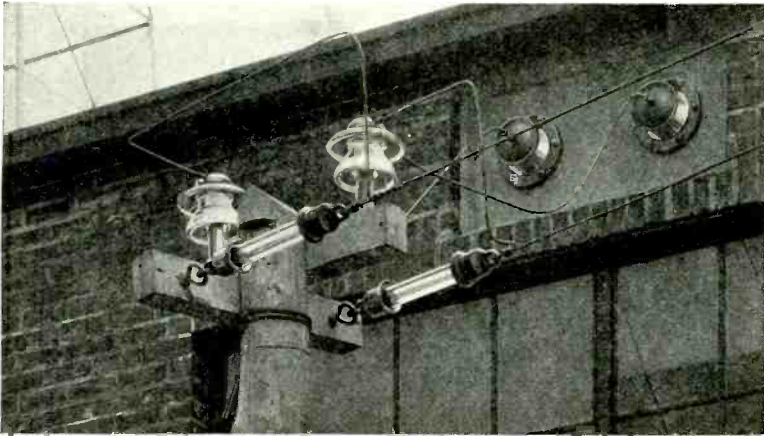
Type B, No. 67093
\$67.50



Type C, No. 67094
\$45.00

Tell them you saw it in RADIO

PYREX RADIO INSULATORS



A group of PYREX Power Line, PYREX Antenna and PYREX Navy Type Entering Insulators at Broadcasting Station WLW, Cincinnati.

The line shown transmits the radio frequency energy from the transmitter proper inside the building to the antenna coupling system, located in the house under the antenna.

AT STATION W2XV

"In our station W2XV we have continuously used both your PYREX Antenna Insulators and PYREX Entering Insulators throughout our whole antenna system.

"These PYREX Insulators have never given us one moment's trouble in all their service. Their ruggedness and insulating qualities are supreme.

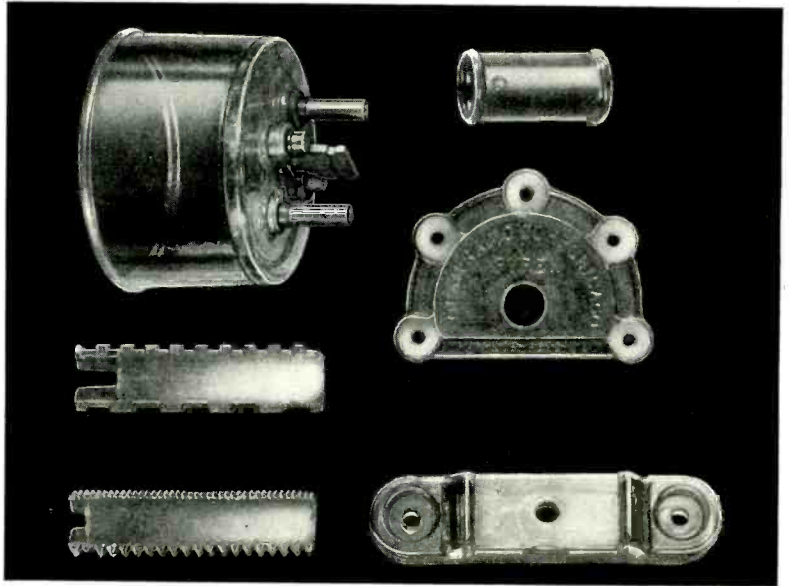
"Whenever we have an antenna installation to make, we always advise the use of PYREX Insulators."
—Frank A. Gunther, Radio Engineering Laboratories, Long Island City, N. Y.

In addition to the various PYREX Brand insulators described in the preceding pages, Corning Glass Works makes special insulating fittings to the designs of manufacturers and assemblers of radio receiving and transmitting devices. Where desired, the technical staff at Corning will assist in developing new designs for maximum efficiency and economical manufacture.

PYREX Resistant Glass Special Radio Parts decrease leakage, conserve energy and provide the same permanent and effective insulation as obtained from standard PYREX Brand Insulators.

If you have an insulating problem, Corning Engineers will be glad to offer their suggestions for its solution.

MISCELLANEOUS PYREX BRAND RADIO PARTS



Power tube base
Ribbon inductance support
Wire inductance support

Coil support
Condenser end plate
Contact terminal block

Insulation Division

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CORNING, N. Y., U. S. A., New York Office, 501 Fifth Avenue

F. I. ELLERT, *Pacific Coast Distributor*
693 Mission Street, San Francisco

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by Corning Glass Works



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of Technical Glassware



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Say Service Men!**

The fact that more Service Men use Durham Resistances for replacement work than any other resistance unit made today means that YOU can count on Durhams to exactly meet your requirements . . . and meet them without “kickback.” Over one and one-half million are used monthly both by radio manufacturers and service men because of Durhams’ greater accuracy of stated ratings, greater uniformity and greater dependability in actual service. Data sheets on all popular types and values sent promptly on request.

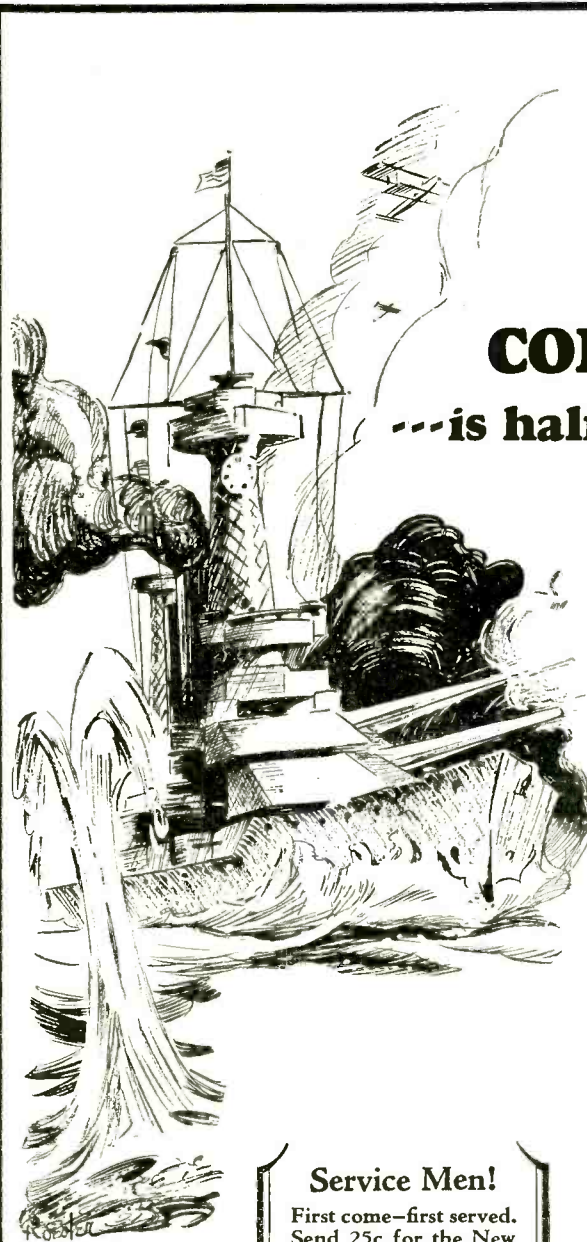


The Voltage **“POLICEMAN”**
in Your **RADIO**

AMPERITE Self-Adjusting Line Voltage Control prevents noisy voltage fluctuations in electric radios. Saves tubes—improves tone. Demand AMPERITE when you buy a radio, include it when you build. For Free Bulletin Write Dept. PR5

AMPERITE Corporation
561 BROADWAY, NEW YORK

AMPERITE
Self-Adjusting
LINE VOLTAGE CONTROL



**CONTROL
---is half the battle!**

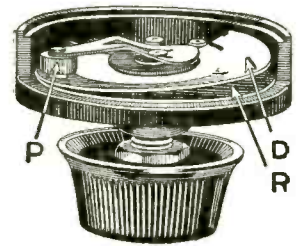
EYES glued to the range finder—delicate nerves of wire from the conning tower to the gun turrets . . . it’s all a matter of control.

Less dramatic but mighty important is the delicate control that holds in check the powerful amplifications of your radio tubes.

For smooth, efficient performance be sure the volume control on your radio is **CENTRALAB**.

Service Men!

First come—first served. Send 25c for the New Centralab-Volume Control Guide, exclusively for Service Men. Send your letterhead or business card.



This shows the exclusive rocking disc construction of Centralab volume control. “R” is the resistance. Contact disc “D” has only a rocking action on the resistance. Pressure arm “P” together with shaft and bushing is fully insulated.

[Write Dept. 103-A for Free Booklet, “Volume Control, Voltage Control, and Their Uses.”]

Centralab

CENTRAL RADIO LABORATORIES

Dept. 103-A

14 Keefe Avenue

Milwaukee, Wis.

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The New

WESTON

MODEL 555

COUNTER TUBE CHECKER

HERE is a valuable scientific instrument for dealers in radio supplies whose business prestige has been built upon selling only thoroughly inspected products. Testing radio tubes with this rapid and accurate checker insures customer satisfaction and prevents "come-backs"—profitless transactions which every dealer should seek to avoid.

EQUIPMENT OF MODEL 555

- 1 Sockets for UX, UY and A. C. Screen grid tubes.
- 2 A six-point filament voltage dial.
- 3 Four push-button switches for making all the required tests.
- 4 Two 3 1/4" diameter instruments—an A.C. voltage indicator and a tube test meter.

SERVICE FEATURES OF MODEL 555

Checks all tubes, A. C. and D. C., including '80 and '81 type rectifier tubes. Tests A. C. screen grid tubes and both plates of the 280 type rectifier (one at a time) without adapters. Indicates shorts between the filament and cathode.

SEE THIS NEW MODEL AT OUR BOOTH OR IN OUR LECTURE ROOM AT THE HOTEL TRAYMORE DURING THE R. M. A. CONVENTION—OR WRITE TO FACTORY FOR FULL PARTICULARS.



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Every A. C. set owner is a prospect for the Vitrohm Unit. It saves A. C. Tubes and insures full tube life. Cuts costly service calls and customer complaints due to tube failure. Send your order today for twelve units packed in three color counter display carton.

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For sets using 65 watts or less

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Filament 7.5 volts
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RECTOBULB

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National Radio Tube Company

3420 Eighteenth St.
SAN FRANCISCO

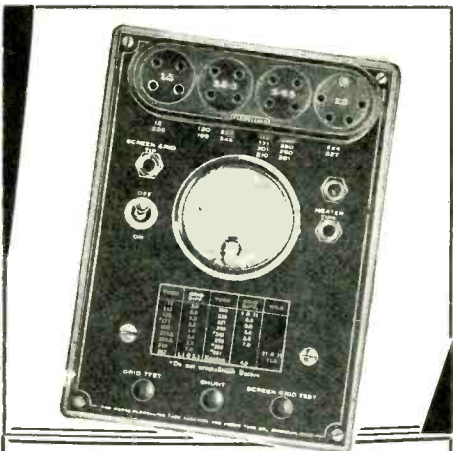
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A new improved model of the most popular tube checker ever sold. Checks tubes three times as fast as other checkers.

Checks any kind of tubes, screen-grid, pentode, Cardon, Kellogg, etc., without adapters. All sockets in numerical order marked with voltages and tube types.

Patented shunt device protects against "shorts" in tube or imperfect contacts on push buttons.

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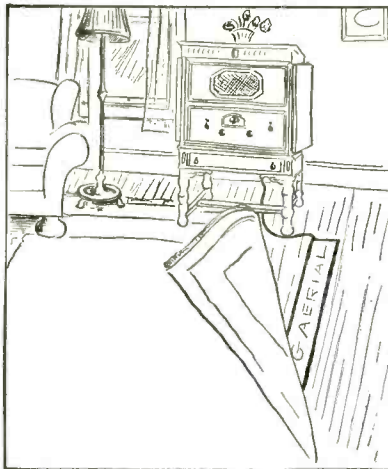
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Much interference with radio reception caused by high tension wires, household appliances, and similar sources can be eliminated through the use of Belden Shielded Lead-in Wire.

Belden Shielded Lead-in Wire consists of a stranded copper conductor, with easy strip rubber insulation and an overall braid of tinned copper.

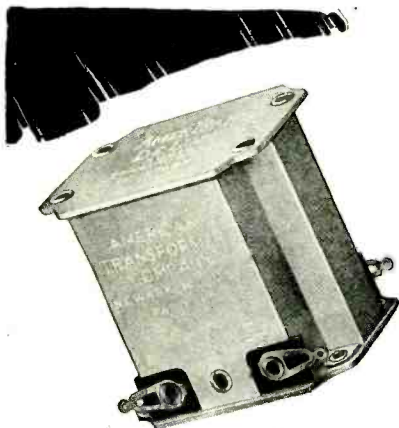
When this wire is used the aerial proper is installed out of the zone of interference. The lead-in conducts the signal energy through the zone of troublesome impulses. This lead-in is shielded so that the interfering impulses are grounded and are not permitted to interfere with the signals.

Radio service men everywhere report remarkably successful results through the use of this interference reducing lead-in wire. Mail the coupon for descriptive literature.

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I want to know all about Belden Shielded Lead-in Wire. Mail your bulletin.

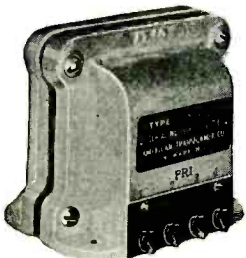
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Address _____



AmerTran De Luxe Audio Transformer—List Price \$8.00. Type 151—Between one input and two output tubes—List Price \$12.00.



Type AF-8 Audio Transformer—Either 1st or 2nd stage audio—Turn ratio $3\frac{1}{2}$ —List Price \$5.00.



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AmerTran Power Transformer—Type PF-245A—List Price \$22.00.



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AmerTran Audio Transformers and Power Transformers shown here perfect the audio system and bring the programs into your home exactly as they go over the air through the microphone. For further descriptions of these and thirty-odd products in the field of radio reproduction that have attained the perfection necessary to AmerTran Standard of Excellence, write for Bulletin 1065.

The facilities of our engineering department are at the service of everyone interested in better radio reproduction.

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Transformer builders for over 29 years

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178 Emmet St., Newark, N. J.

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Address

R-6-30

NEXT MONTH—

The Show Report
Issue of

RADIO

GIVING all specifications, list prices and data on new sets exhibited at the R. M. A. Show.

"RADIO" will cover the Show—from booth to booth. The July SHOW REPORT ISSUE will be another feature number.

STATEMENT OF OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

"RADIO," published monthly at San Francisco, Calif., for April 1st, 1930.

State of California, County of San Francisco, ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared H. W. Dickow, who, having been duly sworn according to law, deposes and says that he is the Business Manager of "RADIO," and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Pacific Radio Publishing Co., Pacific Bldg., San Francisco; Editor, Arthur H. Halloran, Berkeley, Calif.; Managing Editor, None; Business Manager, H. W. Dickow, Pacific Bldg., San Francisco.

2. That the owner is:

Pacific Radio Publishing Co., Pacific Bldg., San Francisco; Arthur H. Halloran, Berkeley, Calif.; H. W. Dickow, Pacific Bldg., San Francisco; H. L. Halloran, Berkeley, Calif.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner and this affiant has no reason to believe that any other person, association or corporation has any interest, direct or indirect, in the said stock, bonds, or other securities than as so stated by him.

H. W. DICKOW,
Business Manager.

Sworn to and subscribed before me this 18th day of March, 1930.

(SEAL) JOHN L. MURPHY,
Notary Public in and for the City and County of San Francisco, State of California. My commission expires May 20, 1933.

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Radio sales, service. Electrical appliances, etc., store located in growing community San Francisco bay region for sale. Exclusive franchises. For details write Gelber Electric Shop, 1529 Pine Street, San Francisco.

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Chassis Division

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CARDWELL CONDENSERS

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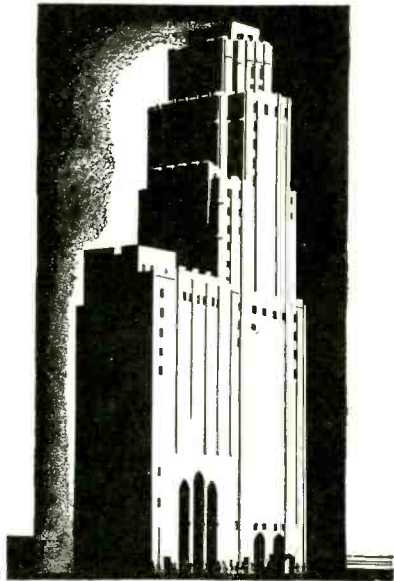
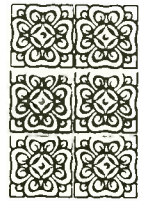
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Choice rooms available
for the Radio Manufac-
turers' Association Con-
vention, June 2 to 6.

Sensible Rates Withal!

HILLMAN MANAGEMENT

HOTEL
ATLANTIC
MOST
CENTRALLY
LOCATED AT
CLARK STREET NEAR
JACKSON BOULEVARD

ONE BLOCK FROM
LASALLE STATION
POST OFFICE &
BOARD OF TRADE

450
ROOMS
\$2 A DAY
AND
UP

FAMOUS
FOR
FOOD

SEND FOR
COPY OF
CHEF'S
RECIPES
AND DES-
CRPTIVE
FOLDER

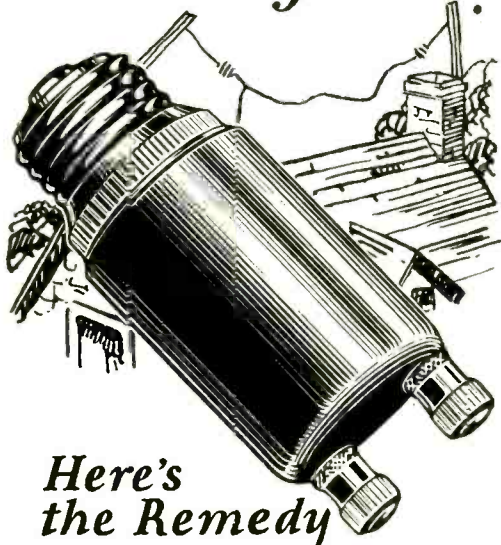
WHEN YOU GO TO
ST. LOUIS STOP AT
THE NEW HOTEL
JEFFERSON
800 ROOMS



CHICAGO

ROESSLER & TEICH
OWNERS AND MANAGERS

No Reason for This!



*Here's
the Remedy*

THE Dubilier Light Socket Aerial connects into the electric light socket, affording to the user all his house-wiring system, and the wires of the light company, for an aerial.

Works with all makes of receiving sets.

Consumes no current whatever. Needs no attention.

Nine years' record in commercial use.

Broad patents issued in 1929 establish Dubilier Condenser Corporation in the full exclusive rights. Price \$1.50 Ask for leaflet No. 163

Dubilier LIGHT SOCKET AERIAL

DUBILIER CONDENSER CORPORATION
342 Madison Avenue New York, N. Y.

TYPE 360 TEST OSCILLATOR



ONE of the new test oscillators for the radio service laboratory is now ready. It will deliver a modulated radio-frequency voltage at any point in the broadcast band (500 to 1500 kilocycles) and at 175 and 180 kilocycles. The tuning control is calibrated with an accuracy of 2 per cent.

The Type 360 Test Oscillator is intended to be used for neutralizing, ganging, and tuning of the radio-frequency stages in a receiver, and it is fitted with an output voltmeter for indicating the best adjustment.

Price
\$110.00

GENERAL RADIO CO.

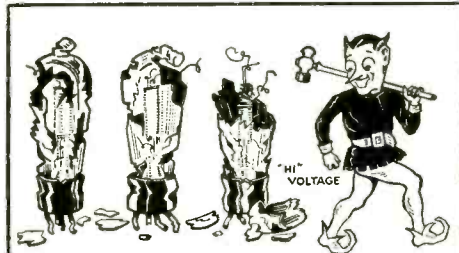
30 State Street
Cambridge, Massachusetts

Harmful "Hi!"

You know what happens when high("Hi") voltage hits radio sets and tubes. Everybody knows.

To end these troubles, we make the Wirt Voltage Regulator—a variable voltage control that is attached between the convenience outlet and the radio set. It effectively controls constantly high voltages to a safe maximum.

The Wirt Voltage Regulator is a profitable item to handle. Hundreds of thousands in use. Fully guaranteed. Two sizes—now read the advertisement that appears in Collier's Weekly, April 12th, to tell 2,220,000 people how they can get more satisfaction from their AC radio sets:

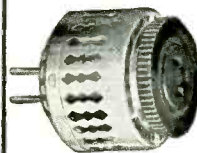


"Hi" Voltage ruins radio tubes

HIGH voltage, prevalent everywhere, burns out your radio tubes long before they would normally be used up. There is one safe remedy, recommended by a number of the best set manufacturers and radio dealers everywhere—

Wirt Voltage Regulator

Easily, instantly installed in any socket or base receptacle. Holds line voltages down to safe maximum. Tends to eliminate line noises. Improves local and DX reception. Fully guaranteed. Hundreds of thousands now in use.



Two sizes—211-B (\$3.25) for sets with dynamic speaker and sets with seven or more tubes; 211 (\$2.25) for sets with less than seven tubes and sets without dynamic speaker. See your radio dealer now.

WIRT COMPANY
PHILADELPHIA PENNSYLVANIA

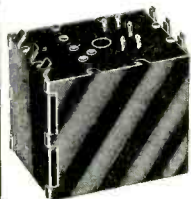
THIS PUBLICITY WILL INCREASE YOUR PROFITS.
ORDER THROUGH YOUR JOBBER

WIRT COMPANY
PHILADELPHIA PENNSYLVANIA

WE SPECIALIZE IN REPLACEMENT PARTS

RCA—Victor—Freed—Edison—Etc.

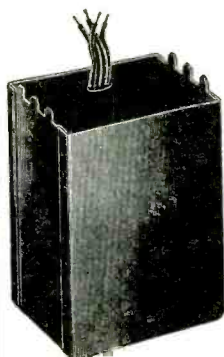
RCA Replacement Condenser



Part No. 8333
LIST \$7.40

BLOCK FOR
RCA
Nos. 17, 18, 33 Sets

Special
\$1.50
each

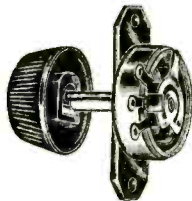


RCA
Double Filter
Chokes
RCA Replacement
Part No. 8336
Contains Two 30-
Henry 80-Mil.
Chokes
Special
\$1.70
Each
Each Choke insulated
for 1000 volts



RCA By-Pass
Condenser
Part No. 5996
Comprising one 1/2 and three .1
mfd. condensers
LIST \$3.00
Our Price 35c

YAXLEY 2000-OHM VOLUME CONTROL



RCA Replacement Part
No. 5091
For Radios 17, 18, 32, 42,
44, and practically all other
sets. Insulating strip (easily
removed) for metal panels.
List Price \$1.95
Ea. 45c. Doz. \$4.50



RCA Choke Coils
15 Henrys—35 Mils. Im-
pregnated in Rosin. Ideal
choke for B Eliminators
and A-C Sets. D-C Re-
sistance 500 Ohms.

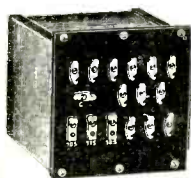
Special 30c

FROST TWIN VOLUME CONTROL



30-3800 Ohms
Will stand up. No more
burned-out volume controls.
Standard for Victor, but can
be used on all sets.
List Price \$2.50
Our Price 55c
Dozen for \$5.50

VICTOR A B C POWER TRANSFORMERS

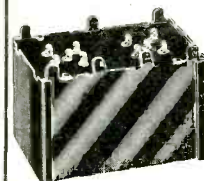


Supplies Voltages for—
6—226 tubes
1—227 tube
1—280 tube
2—245 tubes.
Can be used in Loftin-
White Circuit
Price \$2.75



VICTOR
Audio
Transformer

Our Price
95c



VICTOR
Push-Pull
Transformers

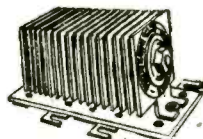
Our Price
\$2.50 Per Pair

GRID SUPPRESSORS



750-ohm, 10c Ea.
\$1.00 per Dozen

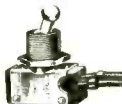
The Famous M16 Elkon New Type Replacement Rectifier



Officially recognized by
Grigsby-Grunow as the
proper replacement
unit for Majestic "A"
eliminator. May be
used on the following
"A" eliminators: Ma-
jestic, Mayolian, Elkon,
Philco, Webster,
Knapp, Gen. Inst.,
Metro, Fada, Bernard,
Sentinel, and Briggs
and Stratton.

First Time at This Price
With Base—\$3.45

Hart and Hegeman Toggle Switch



For Battery and Electric Sets
Approved by Underwriters
20c Each—\$2.15 per dozen
General Electric A-C Switch
20c Each—\$2.15 per dozen

Polymet By-Pass Tubular Condenser



1 Mfd., 200 Volts
Can be used across
Choke Terminals in
Victor Sets to reduce
hum.



Polymet Hi-Volt, 1 Mfd.
Filter Condenser, 300
Volts D-C
35c Each
\$3.60 per dozen

FIXED PIG-TAIL RESISTORS



	500	10,000	25,000
Ohms	2000	15,000	50,000
	4700	20,000	100,000
			250,000

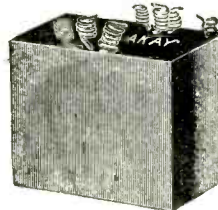
\$1.00 Per Doz.

"BAL-RAD" REPLACEMENT BLOCKS

All Brand New and Fully Guaranteed—Products of an Old Reliable Manufacturer



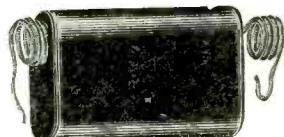
A replacement block
for Majestic elimi-
nators, guaranteed for
a period of one year.
The condensers in this
block are all composed
of high voltage con-
densers, and you can
be assured that once
this block is installed
it will last indefinitely.



(For Atwater Kent Elec-
tric Set, Model No. 37)
This unit contains the
proper chokes and high
voltage condensers. All
flexible wire colored leads
identical to the original.
Fully guaranteed.

Net \$2.95 each

The "BAL-RAD" HY VOLTAGE UNCASSED SURGE-PROOF—For General Repair and Power- Pack Work



	Each
One MFD. 600 Working Volts	\$0.30
Two MFD. 600 Working Volts	.40
Four MFD. 600 Working Volts	.60
One-half MFD. 300 Working Volts	.25

This "Bal-Rad" Condenser is the result of many suggestions from service men throughout the country. It is small and compact, impregnated in pitch with long flexible leads to facilitate making connections quickly. Can be placed outside of pack. We guarantee these condensers for 100% free replacement. Dealers and service men should carry a few dozen in stock.


MAIL
ORDERS
TO:

BALTIMORE RADIO CO. 47-D MURRAY STREET
NEW YORK, N. Y.

Send for Our Latest Bargain Catalog

TERMS:—20% with order, balance C. O. D. 2%
discount allowed for full remittance with order only.

10TH ANNUAL BOSTON RADIO EXPOSITION



**ENTIRE BOSTON GARDEN
AND EXPOSITION HALL**

Sept. 29 - Oct. 4

**Radio's Newest Develop-
ments! Newest Features!
The Biggest Show Ever!**

**SHELDON FAIRBANKS
EXPOSITIONS, Inc.**

*Originators of World's
First Radio Show*

For Space, Write, Wire or Call—

260 Tremont Street
Boston, Mass.
HANCOCK 0864

Dubilier Condensers

for replacement in Receiving Sets,
Eliminators, Speakers, etc.



Wherever there is a condenser to be replaced, there is a block to be had from Dubilier—leading manufacturer of radio condensers.

These replacement blocks are not mere copies of condensers originally used by manufacturers of the sets. They have been designed in relation to each set's particular conditions by an organization eminently qualified to produce

THE BEST CONDENSERS EVER MADE

These condenser-blocks are designed to give

1. Ten years or more of service;
2. Ample safety factors in place of the makers' first specifications;
3. The greatest value for the money.

Dubilier blocks cover the best known makes—Atwater Kent, Bosch, Columbia-Kolster, Crosley, Fada, Freed-Eisemann, Freshman, Howard, Kolster, Majestic, Radiola, Stewart-Warner, Stromberg-Carlson, Zenith, and others.

DUBILIER CONDENSER CORPORATION
342 Madison Avenue New York, N. Y.

SEND NOW FOR OUR LATEST
**RADIO BARGAIN
BULLETIN No. 31**

CHOCK FULL OF REAL
LIVE BUYS AT
REMARKABLY BIG
SAVINGS TO YOU

AMERICAN SALES CO.

19-21 Warren Street, New York City, N. Y.

**MR. MANUFACTURER and
MR. JOBBER!**

We are outright cash buyers of surplus stocks of standard Radio Merchandise.

In fact we have cash resources that permit us to buy stocks of any quantity and they can't come too big.

Before disposing of your next lot be sure to get our cash bid.

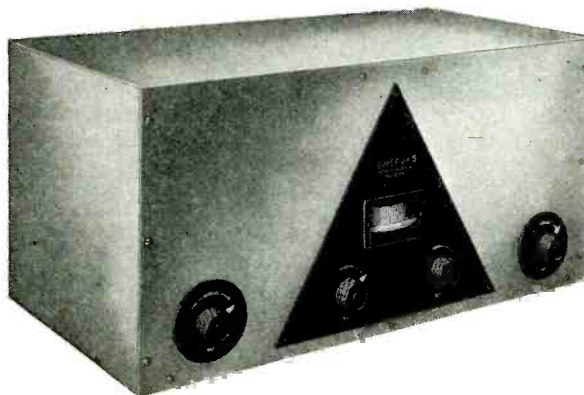
Upon receipt of complete details—such as make, models and amount of stock on hand—we will promptly submit our bid.

Write, wire or phone full details today.

AMERICAN SALES CO.

19-21 Warren Street, New York City
Barclay 1496-1497

WORLD-WIDE
RECEPTION
WITH THE NEW
NORDEN-HAUCK
SHORT-WAVE
SUPER DX-5



Size: 9 x 19 x 10 inches. Weight: 30 pounds

ENTIRELY NEW
ADVANCED DESIGN
NEW PENTODE TUBE
SENSATIONAL DISTANCE
RANGE 11½ TO 205
METERS
RELIABLE PERFORMANCE
A-C AND D-C MODELS
ADAPTABLE FOR LONG
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Write, telephone or cable TODAY for
Complete Information

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CROSLLEY RADIO



THE CROSLLEY RADIO CORPORATION

Powel Crosley, Jr., PRES. Cincinnati, O. Home of WLW - "the Nation's Station"

You're *THERE* with a Crosley

YOU CAN'T BEAT FACTS

... here are three
that help you sell

1

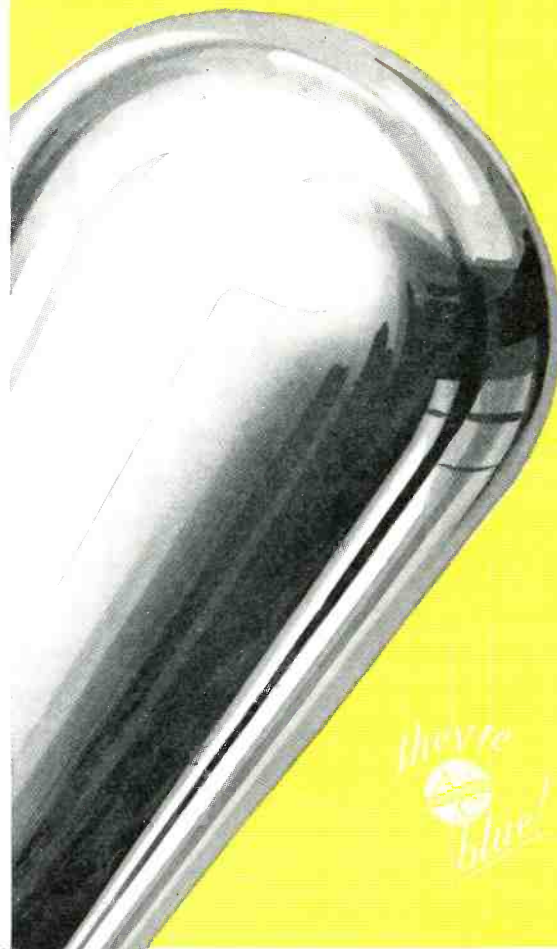
Let your customers hold a watch on any set equipped with Arcturus Blue Tubes. No question about QUICK ACTION... the program is there in 7 seconds!

2

Let your customers listen to the CLEAR TONE that is characteristic of Arcturus Tubes. There's no hum, no background noise to mar any program.

3

Put an Arcturus Tube in your meter. See how it withstands overloads. This kind of stamina has given Arcturus Tubes the world's record for LONG LIFE.



A RCTURUS BLUE TUBES sell easily because you can quickly demonstrate their superiority to the most critical buyer.

And the same self-evident superiority that sells Arcturus Tubes *keeps* Arcturus buyers sold. Thousands of dealers *know* that Arcturus quality improves set operation and cuts service calls to the minimum.

If you want to sell a tube whose popularity rests on *performance facts* instead of reputation, get started now with Arcturus.

ARCTURUS RADIO TUBE CO., Newark, N. J.

See the
ARCTURUS
Exhibit at
the R. M. A.
Trade Show,
Booths A-11
and 12.

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TUBES for every RADIO
ACT · IN · 7 · SECONDS