

RADIO



SEPTEMBER
1930

and
NOW-



Clarion Jr.
THE MIGHTIEST MIDGET

See Pages 6 and 7

SUPERHETERODYNE



ANNOUNCEMENT

America's first and oldest manufacturer of a. c. screen-grid radio receivers is also the first and oldest superheterodyne designer, and now first to announce a licensed super. ¶ There are only two radio manufacturers in America today with actual superheterodyne manufacturing experience. Of these, McMurdo Silver developed the first super ever to gain national popularity. ¶ Now, under

his personal supervision, the famous S-M laboratories have produced the greatest of them all—SILVER-MARSHALL radio! Ten tuned circuits, nine tubes, 5 screen-grid, tone control—every advanced feature. ¶ All that SILVER-MARSHALL is asking of the public this season—as last year—is just to tune an S-M superheterodyne before buying any radio. ¶ Ask your distributor about an entirely new type of protective franchise—or wire us today and we will give you his name.



SILVER-MARSHALL, INC., 6441 West 65th Street, Chicago, U. S. A.

SILVER-MARSHALL

RADIO

SPEED RADIO TUBES

RCA LICENSED



227

The most perfect detector made — that's why SPEED 227's cost more for us to make, but not for you to buy. Burn-out proof! Fast heating — 5 seconds flat (not by words—by test!)

224

New? Not to us. In production in 1928 when demand was only experimental. While others have been announcing, we have been improving. That's what foresight and tube-making experience were able to do.

245

Perfected and in production weeks ahead of others. Very rigidly constructed — extra bracing of the elements and special anchoring of filament in the SPEED 245 give added volume and finer tone quality.

THE SPEED Tube line is, of course, complete*. But these are the "Big Three" now—the ones you're interested in particularly, because they're the ones your customers want. Carry the quality 227's, 224's, 245's—SPEED—and your tube business is assured.

Representatives in 30 cities—warehouse stocks less than 24 hours away—you get service with SPEED • Write for the complete SPEED program now.

* The SPEED line also includes the 201A, 199, X140, WD11, WD12, 200AA, 112A, 171A, 171AC, 210A, 250, 226, 280, 281, 230, 231, 232, 222, S-84, S-82B.



SPEED

CABLE RADIO TUBE CORPORATION

84-90 No. Ninth St., Brooklyn, N. Y.

MAKERS OF RADIO TUBES SINCE 1924

Tell them you saw it in RADIO

RADIO

Established 1917

Reg. U. S. Pat. Office

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ARTHUR H. HALLORAN	- - - - -	Editor
HECKERT L. PARKER	- - - - -	Merchandising Editor
P. S. LUCAS	- - - - -	Associate Editor
H. W. DICKOW	- - - - -	Business Manager
FRANK C. JONES	- - - - -	Technical Adviser
A. I. RIVETT	- - - - -	Draughtsman

BRANCH OFFICES—

NEW YORK: 415 Lexington
Avenue
Phone Murray Hill 5992

CHICAGO: 307 North
Michigan Avenue
Phone State 6079

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CONTENTS for September, 1930

Thousand-Dollar Shoestrings <i>By Henry L. Williams</i>	19
Simplified Bookkeeping System for Radio Dealers <i>By G. S. Corpe</i>	21
Profit Promotion Through Proper Store Management <i>By William E. Koch</i>	27
If I Owned a Radio Store <i>By Dr. Ralph L. Power</i>	29
One Free Service Call <i>By C. B. Bailey</i>	30
Specialized Radio Service <i>By Pauline Slaughter</i>	31
They Sell Only Radio Service <i>By Harold J. Ashe</i>	31
Determinants of Radio Design <i>By Austin Armer</i>	33
Getting Those Overdue Accounts Paid Up	43
Radiatorial Comment	44
Prices and Specifications of Radio Receivers	46
If The Customer Says, "Charge It" <i>By John T. Bartlett</i>	48
House-to-House Selling <i>By Harry P. Bridge, Jr.</i>	49
Ten Short Cuts to the Poorhouse <i>By Ernest W. Fair</i>	50
Selling Radio by Recorded Music	51
What Causes Good Tone Quality From a Radio <i>By H. L. Parker</i>	52
News of the Radio Industry	53
Who Distributes It Now	54
New Radio Equipment	55
Association News	56
Personal Mention	57
New Radio Catalogs	57

A Suggestion to the Reader:

After reading this September 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.

PROFITABLE ADVERSITY

THERE is more truth than fiction in Shakespeare's "Sweet are the uses of adversity." While he could not have had the adverse conditions of the radio industry in mind, he expressed the thought which is implied in the axiom, "The greater the difficulty, the greater the incentive to overcome it." Proper use of the present time of trial can make it more profitable than the former period of "profitless prosperity."

Most of last year's efforts seemed to be directed toward increasing the volume of radio sales, regardless of the cost of so doing. Men were insufficiently trained, credit was unwisely extended, and trade-ins were foolishly accepted. Profits were sought, not so much from hard work in one's own business as in gambling on the prospects of the other fellow's business.

This year the radio dealer can afford to employ only the best-trained service and sales people. He has learned to be careful in extending credit and taking trade-ins. He has no funds for stock speculation and he has seriously gone to work to make the most of his own business.

One important factor in this attempt to profit during adversity is the training of the sales and service organization. The manager should become a teacher. In this teaching the best textbooks that he can employ are the radio trade magazines. Their columns are filled with information that is designed to guide the radio dealer toward the goal of profits in business. During these days of less hectic selling there is opportunity for study of methods which will bring profits when the business cycle again turns upward, as it is bound to do.

These are some of the uses of adversity that will sweeten the future years. And in the meantime net profits on smaller volume can be made as great or greater than in the days of big sales volume.



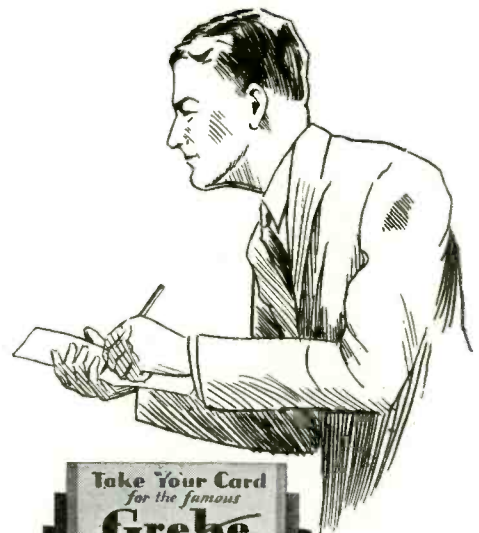
In your store

Grebe stages a drama with a profit climax

ANOTHER original Grebe idea: the *7-check test. Here is store merchandising that stages demonstrations for you—drama with profit at the climax. Instead of attempting to lure the consumer with glib phrases, this plan sells him Grebe radio on actual performance. The large window display pulls him in—the counter display holds him—the test card shows him how to select his set with a definite realization of the kind of an enjoyment it will bring into his home.

By means of a simple scoring method, the 7-check test shows at a glance how the new Grebe compares with any other set for (1) Tone, (2) Control, (3) Selectivity, (4) Sensitivity, (5) Decorative quality, (6) Construction and (7) Value. How to judge these qualities and appraise every radio accurately is clearly told in non-technical language.

With the moderate-priced AH1 presented as a companion line to the refined and improved SK4, Grebe dealers and jobbers face confidently the issue brought before the public in the 7-check test.



A. H. GREBE & COMPANY, Inc., Richmond Hill, New York

Western Branch, 443 So. San Pedro Street, Los Angeles, California

* Copyrighted

and now —

\$ 63³⁰

Complete
with
Matched Certified
Clarion Tubes

Here are a few reasons why
Clarion Jr. will roll up
additional profits for
Clarion dealers:

- Triple
Screen-grid
- Screen-grid
Power Detector
- Completely
Shielded
- Push-pull 245's
- Tone Control
- Local-distance
Switch
- Full
Electro-dynamic
Speaker
- Illuminated Dial
- Phonograph Jack



Battleship construction
throughout. Ample sensitivity to
bring in distant stations. Selectivity
rivaling the most expensive radios.
Beautiful walnut cabinet with decorative
burl overtop.

THE MIGHTIEST MIDGET ON THE MARKET

Clarion Jr.

RADIO

Clarion Distributors

BIHL BROTHERS, Buffalo, N. Y.
BOETTICHER & KELLOGG
Evansville, Ind.
BLACKMAN DISTRIBUTING CO.
New York City, N. Y.
CAROLINA LUGGAGE CO.
Greensboro, N. C.
DAKOTA ELECTRIC SUPPLY CO.
Fargo, N. D.
J. E. DILWORTH COMPANY
Memphis, Tenn.
DUDA-MYERS CO., Hastings, Nebr.
ELECTRIC LAMP & SUPPLY CO.
St. Louis, Mo.
R. F. & W. R. FITCH, Oskaloosa, Ia.
FORT SMITH RADIO CO.
Fort Smith, Ark.
FRONT COMPANY, Wheeling, W. Va.
WILLIAMS HDWE. CO.
Minneapolis, Minn.
GREENVILLE TEXTILE SUPPLY
Greenville, S. C.
HERBERT HORN, Inc., Los Angeles, Calif.
W. F. & W. H. JACKSON
San Francisco, Calif.
KELVINATOR-SYRACUSE, Inc.
Syracuse, N. Y.
M. & M. CO., Cleveland, Ohio
McINTYRE & BURRALL COMPANY
Green Bay, Wisconsin
McLENDON HDWE. CO., Waco, Texas
HARRY MOLL, Inc., Denver, Colo.
NATIONAL ACCESSORIES, Inc.
Omaha, Nebr.
PATTERSON PARTS CO.
Cincinnati, Ohio
RAY & WALKER HDWE. CO.
Chattanooga, Tenn.
REPASS AUTO & RADIO SUPPLY
Waterloo, Iowa
E. M. WILSON & SON, Newark, N. J.
ROBERTS AUTO & RADIO SUPPLY
Philadelphia, Pa.
ROCKEFELLER ACCESSORY HOUSE
Sumbury, Pa.
H. C. SCHULTZ, Inc., Detroit, Mich.
SHARAR-HOILMAN, Inc., Rochester, N. Y.
STANDARD SUPPLY CO.
Portsmouth, Ohio
STAUFFER, ESHLEMAN & CO.
New Orleans, La.
STERN & COMPANY, Hartford, Conn.
TOWNLEY METAL & HDWE. CO.
Kansas City, Mo.
UNION TIRE & SUPPLY CO.
Burlington, Iowa
U. S. RADIO CO. OF PA., Pittsburgh, Pa.
WAKEM & WHIPPLE, Inc., Chicago, Ill.
ISAAC WALKER HDWE. CO., Peoria, Ill.

with TONE CONTROL

THE MIGHTIEST MIDGET ON THE MARKET

YOU HAVE BEEN EXPECTING IT—and here it is—the greatest “little” radio on the American market—a small edition of “The Greatest Radio Value at any Price”—Clarion.

Clarion Jr. is a husky young radio—truly a “chip off the old block.” Engineered *first* to be a good radio, and *second* to fit the midget size cabinet, we offer Clarion Dealers a typical TCA Product, outstanding in price and performance.

Clarion Jr. will “speak for itself” alongside of any so-called “Midget” set (and many of the big radios)—and the answer will be obvious—Clarion Jr. leads the small radio field by a big margin—just as Clarion Radio leads among the console models.

No need to tell live wire radio dealers of the sales possibilities offered by Clarion Jr., which opens a new field of buyers who are buying NOW!

Why just “pull through” the season when you can get Clarion Jr. from your Clarion distributor at regular discounts and on regular terms and make some money—NOW. Write, wire or phone—but *do something!*

TRANSFORMER CORPORATION OF AMERICA

Keeler and Ogden Avenues, Chicago

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

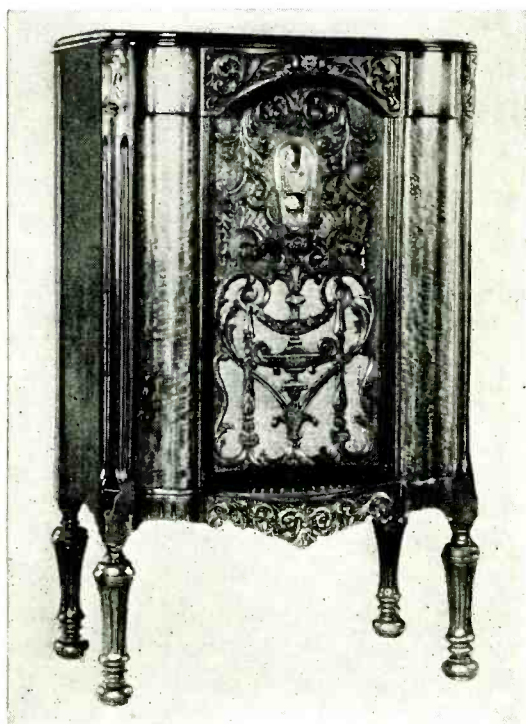
Cable Address “CLARION, CHICAGO” All Codes Used

Clarion Radio

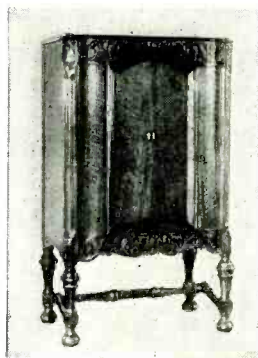
THE GREATEST RADIO VALUE AT ANY PRICE

FOURTEEN • (14)

FEATURES INCLUDING THE FAMOUS FADA TONE



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



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



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

...clear the way to easier radio sales

LOOK where you will, Mr. Dealer, no radio has so many good reasons for being bought as the New Fada.

While a staggering distance has been opened between Fada quality and its competition, the price gap has been practically closed. Never before has Fada offered so much radio value per dollar of investment; so much more than any other radio.

14 Features including the famous Fada tone, clear the way to easier sales. This tone is now hedged about by ingenious circuits that deliver it to the listener's ear with less effort on his part, with less damage by static, and with none by interference or unskilful operation. The multi-featured Fada is the most advanced radio of the year, bar none.

Fada is the radio of the beautiful demonstration. Prospects who watch it, want it. If competition has bothered you, get rid of the worst of it by taking on the Fada. Wire or write today for complete details.



OTHER NEW FADA MODELS

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

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



Fada Models 42, 44, 41 and 46 are also available for operation on 25 cycle or direct current (DC) at slight increase in price.

ONLY THE NEW FADAS HAVE ALL THESE 14 FEATURES

- | | |
|------------------------------|---|
| ★ Noise Filter | ★ Humless Operation |
| ★ Automatic Volume Control | ★ Phonograph Connection |
| ★ Finer Tone | ★ Local Distance Switch |
| ★ Flashograph | ★ Pre-selector Tuning |
| ★ Beautiful Cabinets | ★ Complete Shielding |
| ★ Fada Dynamic Speaker | ★ Two-element Detector |
| ★ One Dial...One-Knob Tuning | ★ Nine Tubes—including three screen grid. |



Same Prices West of the Rockies, Slightly Higher in Canada and for Export

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

1920 · SINCE BROADCASTING BEGAN · 1930

THE WORD IS GOING ROUND THE TRADE:
EVEREADY RAYTHEONS
ARE HERE AND . . .

coming!



Eveready Raytheon
4-Pillar Tubes cost no
more than other estab-
lished makes.

service-men are enthusiastically engaged in a nation-wide house-to-house canvass of prospective tube customers.

Most important of all, a host of set-owners are asking dealers to demonstrate the superiority of Eveready Raytheon Tubes in their own radios, at home!

This means but one thing — a realization that quality reception requires quality tubes — and that the patented *4-Pillar construction* of Eveready Raytheons puts them head and shoulders above the common run!

Eveready Raytheons come in all types, and fit the sockets of every standard A. C. and battery-operated radio in present use. Ask your jobber, or write us now for the names of jobbers near you.

Service-men! Information and sales helps, designed for your use, will gladly be sent to you free. Among them is a blue-print, giving engineering data on Eveready Raytheon 4-Pillar Tubes. Write our nearest branch.

* * *

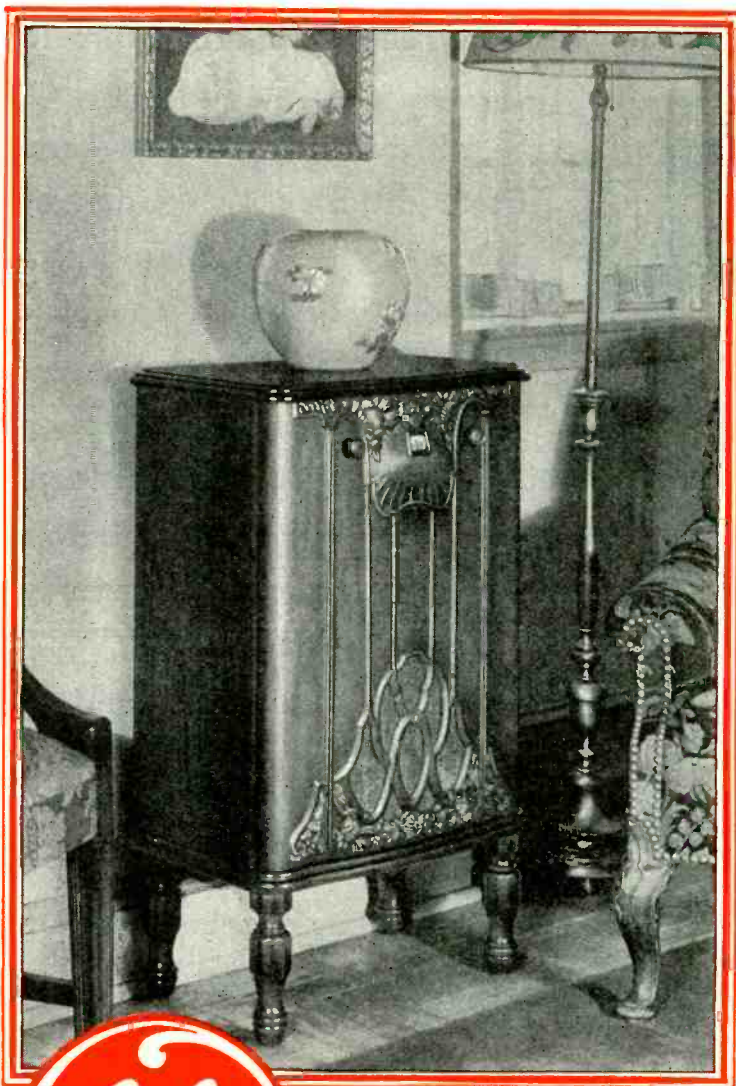
The Eveready Hour, radio's oldest commercial feature, is broadcast every Tuesday evening at nine (Eastern daylight saving time) from WEAJ over a nation-wide N. B. C. network of 31 stations.

NATIONAL CARBON COMPANY, INC. General Offices: New York, N. Y.
Branches: Chicago Kansas City New York San Francisco

Unit of Union Carbide  and Carbon Corporation

Eveready | Raytheon | 4-Pillar Tubes

General Electric



THE NEW STUDIO
LOWBOY

THE hundreds of people in your community who are in the market for a small low-priced set want the G-E monogram on their radio just as much as those who are interested in the higher priced models.

To open this tremendous market to the G-E Radio Dealer, General Electric has produced this new Studio Lowboy.

In its own price class, it has no superiors—it is an outstanding radio value of the season.





adds a NEW low
priced model to
its *Radio Line*

COMPACT in size
34⁵/₈" x 20¹/₂" x 12⁷/₈"
and unusually attractive
in appearance, it not only
represents a marvelous
price attraction to the
dealer's store but it caters
to a triple market—the
low price market—and
also as a second set.



BRIEF SPECIFICATIONS

*7-tube A.C. operated
Screen-Grid receiver
Four tuned circuits
Power Screen-Grid detector
Push-pull audio
New type dynamic reproducer
Compound type volume
control
Horizontal drum station
selector*

Get in touch with your G-E Radio
Distributor *today* or write Section
XXX, Merchandise Dept., General
Electric Co., Bridgeport, Conn.,
to obtain full details of this won-
derful addition to the General
Electric Line.

GENERAL  ELECTRIC
RADIO



Illustrated
THE PA-250
 Super Power
 8-Tube
 Amplifier . . .
 Suitable for
 ANY use . . .
 Supplies its own
 Microphone
 Current
**15 WATTS
 OUTPUT**

List
 Price
\$220

NEW IMPROVEMENTS NOW MAKE THE BARRETT AMPLIFIER THE UNDISPUTED LEADER IN THE FIELD

THEY told us that the BARRETT AMPLIFIER was the BEST of all. They listened . . . they bought! But our engineers set about to still further improve this sensational amplifier.

Larger transformers now appear in the new models. Larger Cores. Better reproduction of the low notes. Input transformer now mounted separately and away from the amplifier proper. This results in elimination of hum due to inductive pick-up.

A STANDARD input transformer, separately, is supplied with each amplifier. Special input transformers supplied for other than standard use. New BARRETT AMPLIFIERS also have a pilot light to indicate whether current is on or off. An extra convenience outlet for phonograph motors and associated equipment, operating both amplifier and motor from one control, is also found on the new models. Finally, the new amplifier is of most rigid construction, built to withstand the most severe service . . . ANYWHERE.

and the BARRETT amplifier ALONE has these important features

It matches its output to any speaker or group of speakers. It has eight tubes, three stages push-pull . . . with built-in *noiseless* volume control and still another control for the supply of microphone current, doing away with the necessity for batteries or a separate microphone amplifier. Just hook on your "mike" and talk. Push-pull eliminates all hum. Eight tubes supply tremendous power and the impedance output control assures you that the speaker and amplifier are *matched for tone*, with a straight line frequency response range of from 40 to 8,000 cycles.

BUY THE BEST

**10-Tube Giant
 Amplifier!**

» « **IT COSTS NO MORE**
 Model PA-866. 30 Watts output. Four '50 tubes in push-pull. 10 tubes in all. Same exclusive features as Model PA-250.

List Price \$297.50

THE BARRETT MANUFACTURING CO.

3714 SAN PABLO AVENUE

EMERYVILLE, CALIFORNIA

Let Us Quote Prices on Hotel, Apartment House and Theater Installations

« **AMPLIFIERS THAT AMPLIFY YOUR PROFITS** »

MODEL 217 JR. CHASSIS

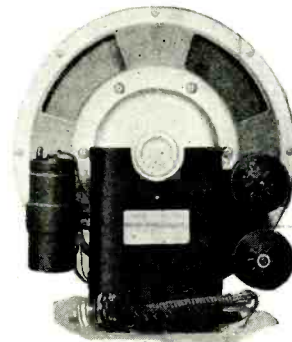


FRONT VIEW
The Speaker of the Year



MODEL 217 G

MODEL 217 JR. CHASSIS



BACK VIEW
The Speaker of the Year

Any Radio can be Only as Good as its Speaker

The utmost in clearness, beauty of tone and truthful reproduction with exactly the desired volume may be always had with Wright-DeCoster reproducers. Those made for home use have all the ultra fine qualities of Wright-DeCoster Theatre Models which are in successful use in movie palaces from coast to coast.

Wright-DeCoster Reproducers

Many larger homes have the beautiful 217 G cabinets in several rooms for reproducing simultaneously from a central receiving set or phonograph.

The New Wright-DeCoster Reproducers
Are Being Used by Manufacturers of
Better Radios and Phonographs

Owners of practically any kind of receiving set may receive more volume on distant stations and more brilliant, truthful reproduction on the locals by replacing their present reproducer with a Wright-DeCoster.



Write for Full Information and Address
of Nearest Sales Office

Wright - DeCoster, Inc.

2217 University Ave., St. Paul, Minn.

Export Dept: M. SIMONS & SON CO., 25 Warren St., New York City
Cable Address: "SIMONTRICE," NEW YORK

MODEL 217 JR. CHASSIS

Model 217 Jr. is for AC operation. The output transformer is of the correct impedance to match the 171-245 or 250 tubes. Either single or in push pull. It will also match the single 112 or 210 tubes.

Model 215 Jr. is for DC operation from the field supply which is standard with most AC Radio Sets. It can also be operated successfully from the 110 volt DC line. The output transformer is the same as that used on the Model 217 Jr.

A Circuit diagram accompanies each speaker showing complete connections for use with any type of output power tube.

What Good's a Miracle UNLESS IT WORKS

JULES VERNE made a big fuss about travelling around the world in eighty days. Here's a man who will make the trip with you in thirty seconds—and you won't even have to leave your easy chair or take off your house slippers!

At first glance he is just a regular nine-run man—nothing to indicate the tremendous power he wields. Yet no man alive—no man that ever lived—can do the things that he can do—simply and quickly.

For example—
—he can flash you from Miami to Montreal and from Hoboken to Hollywood as fast as your eye can take in the four corners of a room—
—he can summon anybody, no matter how big or how important, to come personally to your home and account for himself—the President of the United States, King George of England—the great and the mighty are all at his beck and call.

—Will Rogers, Amos and Andy, Rudy Vallee—such fellows as these he orders around like flunkies. "Crack a few jokes for my friend here!" "Get funny for the kiddies!" "Strike up the band—the youngsters want to dance!"

Are you tired of being slat in? Are things dull? Do you really crave diversion? All right! This modern miracle man will pep things up. He will stick the Yale Bowl right in your own front room and give you the game, play by play—all the color—strutting hands—yelling and cheering.

Or how about a little prize fight—a new Dempsey, let us say, taking a crack or two at one of those foreign invaders right in your own front room—private showing—ringside



In order to see the... (text is small and partially illegible)

—slam! bang! And not even a single chair kicked over.

The marvelous things you can do with a radio! The places you can be! Flesh to flesh into the pulsations of life. The drama, pathos and laughter of it all—into it right while it happens. For you, first hand, the words and the deeds out of which the rest of the world makes its tomorrow's newspaper.

But while you are reveling in all this—don't be an ingrate. Give a thought to the one man

who keeps the lanes of the air open to you and personally makes all this possible. Without your neighborhood radio expert there, could be no radio.

Engineers have conceived the principles of this great, modern miracle. Manufacturers have built the sets. Powerful stations fill the ether. But what engineers think or manufacturers produce or stations broadcast amount to exactly nothing unless somebody captures this great blessing for you and makes it, for you, a personal benefaction by bringing it to you—
—and setting it up
—and seeing that it functions.

Far-flung are the great chains—National Broadcasting and Columbia. Efficient and powerful are the 600-odd stations of the country. But all must wait for this modest man to call them on and give them right of way. Even Old Man Henderson himself cannot do his stuff until your neighborhood expert has seen to it that all connections are O.K., that the "ground" and the aerial are right, that interference has been spotted and whipped, and that there are no tired tubes.

Give thought to your own neighborhood radio expert, your radio dealer. Others have figured out the miracle—but what good is a miracle—UNLESS IT WORKS!



Published just for the good of the cause in behalf of the Radio Dealers of America, by the Everyman Electric Company, Inc., North Bergen, New Jersey. Author: HENRY MAX HADDO VERES

PERRYMAN





Watch Perryman go ahead this year. The full page newspaper advertisement shown opposite is the first in a national newspaper campaign to support radio dealers in a drive for new, profitable business.

Watch Perryman this year. But don't be content to watch from the side lines. Get into the thick of the push to put radio tube business on a sound, paying basis. Join the Perryman distributor-dealer organization. Get acquainted with the liberal Perryman policies that have bound together an energetic army of jobbers and dealers and

kept them loyal to Perryman year after year. Get acquainted with the Perryman tube, a product of extraordinary merit, built in a model, modern factory, protected by rigid inspection and delivered with a liberal guarantee to back up every sale and satisfy every customer.

For full information about

Perryman tubes, prices, discounts and sales helps, write today. Use the coupon.

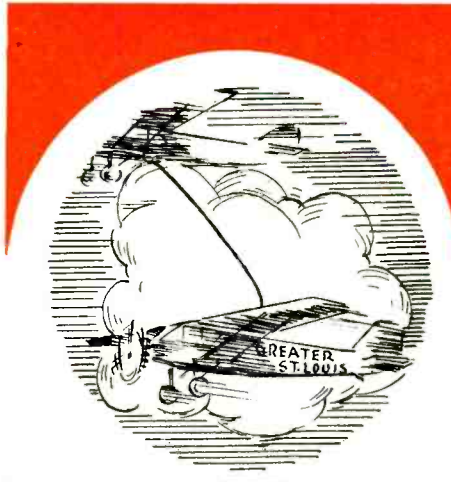
Perryman Electric Co., Inc., Hudson Boulevard, North Bergen, N. J.

Perryman Electric Co., Inc.
North Bergen, N. J.

Gentlemen:

What are you going to do to help me get business this year?

RADIO TUBES



It's going on "the survival"

IN RADIO SERVICE the age-old law of life, "the survival of the fittest," rules with a mailed fist. More so, when competition is intense and there is less business to go around. It is then that the real endurance test begins...half-way methods take a tail spin...business goes where 100% dependability can be expected.

Like the SIAMESE TWINS, SERVICE AND SALES in Radio are bound together—one can't live without the other. That's why as never before the merchant, as well as the radiotrician, needs the convincing accuracy, the speed, enduring leadership of SUPREME TESTING INSTRUMENTS.



Size 7½x12 3/16x18 7/16 **\$139.50**
Dealers' net price, f. o. b. Greenwood, Miss.

An even smaller case, compartments for tools, etc., eliminated.

"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, pentode, 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 coils), 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 ma. 0/2½ amps.
- External connections to all apparatus.
- Universal analyzer plug.
- Screen-grid and pentode 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, pentode 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

Radio Diagonometer

conceivable
Makes every *Nest* on any Radio Set-

START your season in the confidence that you are equipped to do the most complete and thorough job of testing and servicing radio sets that it is possible for human ingenuity to assure. Equip your service corps with the Supreme Diagonometer. Make it an integral part of the Sales Department, insuring a closed sale when the set is loaded on your truck. Supplementing its countless circuit combinations with ANALYSES OF PENTODE, SCREEN GRID TUBES AND CIRCUITS, it is recognized by manufacturers, technicians and service men as the wisest and most economical profit-producer because:

1. It is built for lasting service—designed against obsolescence.
2. The only portable instrument that gives all the perfect results of a complete radio laboratory.
3. Operation so simple that every radio man quickly qualifies as an expert.
4. Pays for itself within a few months in faster work, more work, and extra profits.
5. As easily handled in the shop as on calls.
6. Ideally constructed for work on auto receivers.
7. Gives the maximum testing equipment in minimum space at least cost—service units in Supreme Diagonometer if purchased separately would cost many times its moderate price.

Make up your mind now to insure your success in the new season with methods that are admittedly "Supreme by Comparison"—place your order for the Supreme Diagonometer today.

"Supreme by Comparison"



Tell them you saw it in RADIO

in RADIO, too— of the fittest "

THE PACE-MAKER

in SET ANALYZERS

SUPREME Set Analyzer MODEL 90

25 Testing Instruments in 1

ALL READINGS
ON ONE METER



Size 4 1/4 x 9 1/4 x 11 1/4. Weight 6 lbs.
Dealers' net price, f.o.b. Greenwood, List Price, \$112.15. **\$78.50**

THROUGH the selection of a single meter, used only in the most costly laboratory equipment heretofore, the Supreme Set Analyzer offers a SMALLER, HANDIER, one meter analyzer that gives a vastly greater number of tests and functions than any other set tester employed! Its superior features partially enumerated below, its greater readings and ranges, are obtained with a smaller number of switches and with much greater ease and speed. In only one way can the Supreme Set Analyzer be compared with other analyzers or set testers, the price \$78.50. Ask your jobber to show you this pace-maker in set analyzing, this super value in testing equipment—"Supreme by Comparison."

79 distinct readings and ranges available—as compared with a maximum of 20 in nearest approaching competitive instruments.

22 distinct ranges for external use—against a maximum of 13 in other instruments—and obtained with only three connections, compared with 7 to 16 connections required in other set analyzers.

All Pentode, Screen Grid and Overhead Heater Type Analyses and tests made WITHOUT ADAPTERS.

Measures screen grid current and Pentode Current.

Tests helium non-filament rectifier tubes.

Measures resistances and capacities.

Measures reactance of choke coils from 2 to 100 henrys.

May be used as output meter on any type of radio, meter adaptable for output impedances ranging from 1,000 to 35,000 ohms.

Provides high and low resistance continuity tests.

READS GRID TO PLATE VOLTAGES.

Meter measures alternating voltages at 1000 ohms per volt.

ONLY SET TESTER OR ANALYZER PROVIDING READINGS OF ALTERNATING CURRENT IN MILLIAMPERES.

Supreme Analyzer plug eliminates the need for adapters.

Battery for continuity testing enclosed and protected, preventing accidental shorts and loose connections. Ordinary flash light cells, readily obtainable everywhere, employed.

PARTICULARLY ADAPTED FOR TESTING AUTO RECEIVERS

ALL LEADING JOBBERS HAVE COMPLETE INFORMATION AND STOCKS OF SUPREME TESTING INSTRUMENTS, INCLUDING SUPREME OHM-METER, SUPREME TUBE TESTERS, MODEL 50. IF YOURS CANNOT SERVE YOU, USE ORDER BLANK ATTACHED.

SUPREME INSTRUMENTS CORP.
GREENWOOD, MISS.

Distributors in all principal cities

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

Export Division: 130 West Forty-Second Street, New York City
Cable Address: LOPREHI, New York

RADIO'S MOST MODERN TUBE CHECKER SUPREME

TUBE CHECKER

MODEL 19



Size 3 1/4 x 9 7/8 x 6 1/16. Weight 6 lbs.
Dealers' net price, f.o.b. Greenwood, Miss.

Counter Type—**\$26.95**

Portable Type—**\$29.95**

Tests all tubes including PENTODE, SCREEN GRID AND THE NEW 2-VOLT TUBES. Acclaimed by dealers as a master stroke in Counter Tube Checker design. So extremely simple that the layman readily, quickly, accurately checks all types of tubes. Yet an instrument that wins the admiration of the critical technician. Rivalled by no other tube checker selling below \$40.00. Large 3 1/2" D'Arsonval movement meter in bakelite case, full size transformer; every type tube tested at correct filament voltage. A flexible model—the double purpose tube checker you have long wanted—readily interchangeable to Counter and Portable use, if complete Model costing \$29.95 is ordered.

SUPREME INSTRUMENTS CORP.
379 Supreme Bldg.,
Greenwood, Miss.

Please ship Supreme Testing Instrument as checked below.

..... Model 400-B Diagonometer Net Cash \$139.50.

..... Model 90 Set Analyzer Net Cash only \$78.50.

..... Model 19 Tube Checker Net Cash only Counter Type \$26.95 Portable Type \$29.95

All prices f.o.b. Greenwood, Miss.
No Dealers' Discount.

Date shipment desired

Signed

Firm Name

Street Address

Town

State

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

“PROVE *to my satisfaction* that Brunswick can out-perform *any set on the market in selectivity*”, said a prominent upstate New York dealer, “and *I’ll guarantee* that Brunswick will *out-sell any set in this market!*”

Located in a territory notorious for its difficult receiving conditions, with one powerful station blanketing the ether, this dealer was naturally skeptical. His sales depended absolutely upon his being able to supply his customers with a radio that would cut through the all-powerful local station and give them a choice of out-of-town programs.

Brunswick engineers gladly met his challenge. They offered to make a wide open test under any conditions, against the most selective competing set he could name.

He picked a model widely known for its selectivity — a brand that had

PIN-POINT SELECTIVITY IS A

led in sales in his district because of that very reason.

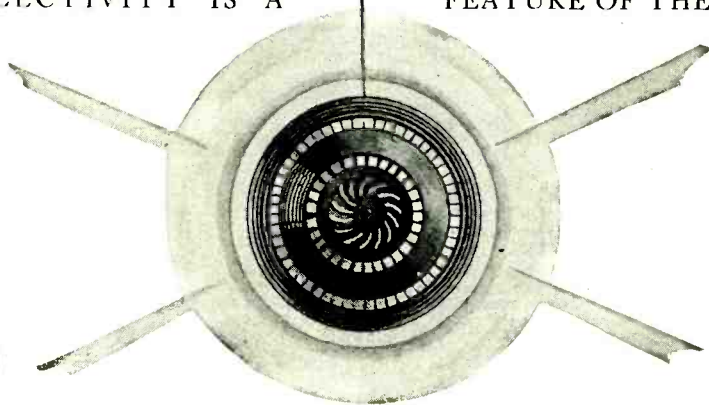
The test was made in a room in a hotel located only a few blocks away from the broadcasting station.

Point-for-point, this dealer checked the two instruments. Brunswick won —*hands down*—not only on selectivity, but also on distance, tone quality, and ability to shield out local interference coming from the hotel elevators, and nearby power-stations.

“All right,” said the dealer with a grin, “you can sign me up. This town is going Brunswick from now on!”

BRUNSWICK RADIO CORPORATION —
MANUFACTURERS OF RADIO, PANATROPE AND
RECORDS — NEW YORK, CHICAGO, TORONTO —
SUBSIDIARY OF WARNER BROS. PICTURES, INC.

FEATURE OF THE NEW BRUNSWICK



Brunswick

RADIO

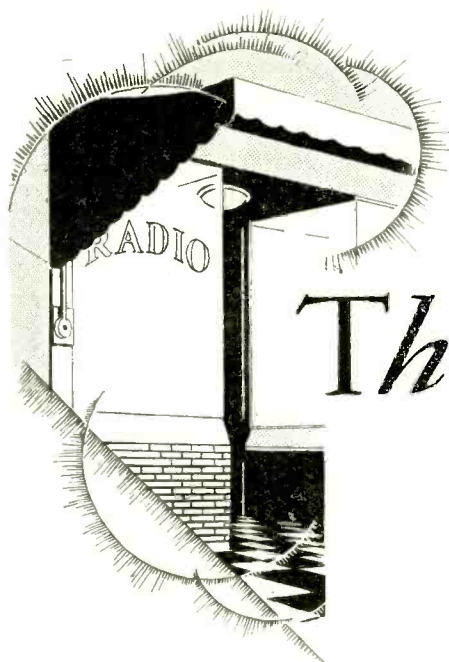
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No. 9



Thousand-Dollar Shoestrings

By
HENRY L. WILLIAMS

HOW much capital does a radio dealer need when starting in business? That is the all-important question that too many have either ignored entirely or been over-optimistic in answering. Without a shadow of a doubt it is the under-capitalization of dealer organizations that has been responsible to a major degree for the lack of stability that has marked the retail radio industry since its inception. This attitude has been fostered and cultivated for a long time by the manufacturers and wholesalers in their mad scramble for more and more retail outlets during the long-drawn-out radio boom period.

Last year saw the end of this frantic race for bigger production schedules, record sales and high-pressure retailing. Those manufacturers who could not stand the pace went to the wall, dragging with them other manufacturers and many distributors who could not withstand the sudden fierce competition of dumped stocks, an epidemic of price-cutting and a subsequent semi-collapsed market. This debacle marked a reversion of the complete merchandising scheme, for the trade was now face-to-

face with a buyer's market. Retailing warfare, by the optimistic expressions of the leaders of the radio industry, and the oft-repeated fallacy that "it's easy to break into the radio game."

Fortunately for the industry as a whole, the more conscientious manufacturers and the more enlightened wholesalers who have been through the mill know and recognize that to succeed they must strive to give the industry at least some semblance of stability. For that reason they are insisting on adequate capitalization for their dealers. No more shoestring-operators for them, and rightly so, for the industry can only be as successful as its dealers.

In the early days, dealers were recruited from the ranks of setbuilders, impecunious electricians, and merchants who knew nothing of radio, but thought it looked like something easy to sell.

Conditions on the other hand are undoubtedly improving. Manufacturers—such of them as have weathered the storm—are carefully gauging their productions; jobbers are not overloaded, and dealers' quotas bear some resemblance to the absorptive capacities of their territories. But, there are still distributors whose greed for business blinds their better judgment; there are still dealers who are ignorant of the simpler laws of economics, and it is these who are largely responsible for a new influx of small operators, deceived by the apparent absence of internecine



knew nothing of radio, but thought it looked like something easy to sell.

When business became tough, the mortality among these rose to as high as fifteen per cent per month. Only the sounder and more substantial remained at the end of 1929, with a leavening of new recruits of every class. These will continue to come, and go, as long as they are given the opportunity, and it is up to the manufacturers and distributors to see that from now on every radio merchant is at least in sound economic condition when he starts out. And this applies not only to capital investment but to that less tangible asset of business ability.

Some manufacturers to-day go even further than this and control every phase of the dealer business so that only the most simple-minded can fail to at least make a living. Most wholesalers too now recognize the necessity for adequate dealer financing, and refuse to franchise those who do not conform to the prescribed standards. The day of the shoe-string dealer is over.

What then is adequate dealer capitalization? What assets should a man have before undertaking the retail selling of radio receivers? The *minimum* requirements are, fortunately, very easily demonstrated. Time and again, would-be dealers approach radio jobbers for franchises, when all the capital they can lay their hands on is \$1000 to \$1500. To accept a franchise under such conditions is economic suicide.

The first thing to be realized is that about eighty per cent of all radio business to-day involves time-payments. This means that the dealer must be prepared to pay for the merchandise within ten to thirty days after receiving it and (a) wait for ten to twelve months for eighty per cent of his money or (b) find a cash reserve of \$1000 to \$2000 for a finance company to handle his paper, or show them \$5000 quick cash assets. In the latter case he will have to wait ten to twelve months for the final ten or twenty per cent of the loan (depending on the company and whether he does his own collecting or not)—on which he gets no interest, and which will probably represent the major portion of his profit on the sale.

Furthermore, few finance companies will willingly handle the *whole* of his business, and he probably will be expected to carry some of the contracts himself. Finally, should any purchaser default during the ten or twelve months payment period the dealer will have to buy back that contract and handle it himself. Because of these reversions, it is a practical necessity for the dealer to handle some of his own paper. Finance companies suggest one-third. Then the dealer has collateral enough to cover any defaulted contracts.

This problem of financing alone should be sufficient to indicate the ab-

surdity of any dealer trying to start in the radio business with a penny less than five thousand dollars, no matter how small his aspirations may be. Let us take for example a full-time exclusive dealer who expects to sell 300 sets a year and

Capital Requirements for Sale of 300 Sets per Year

		Per set
Cash	\$1,000	\$ 3.33
Accounts receivable	800	2.66
Notes receivable	2,000	6.66
Inventories:		
New radios	2,000	6.66
Used radios	600	2.00
Radio parts, accessories and tubes	300	1.00
Fixed assets:		
Building fixtures (signs, etc.)	150	.50
Shop equipment	250	.83
Service car	600	2.00
Furniture and fixtures	400	1.33
Total money used in the business	\$ 8,100	\$27.00
Of which operator should own 60 per cent	4,860	16.20

SELLING EXPENSE

Salary—Owner	\$ 2,400	\$ 8.00
Salary—Salesmen	600	2.00
Commissions, bonuses	6,500	21.66
Salaries, clerical	1,200	4.00
Other salaries	120	.40
Unsold labor (200 days of 8 hours at 75c)	1,200	4.00
Delivery expense	600	2.00
Policy adjustments	1,500	5.00
Heat, light, power	140	.47
Supplies	60	.20
Maintenance expense	60	.20
Advertising	600	2.00
Rent, \$80 per month	960	3.20
Depreciation, repairs, taxes, insurance, interest	310	1.03
Freight and express	120	.40
Memberships and dues	60	.20
Company car expense	480	1.60
Telephone and telegraph	60	.20
Postages	60	.20
Traveling and entertaining	120	.40
Legal and auditing	100	.33
Miscellaneous expense	120	.40
Total expense	\$17,370	\$59.20

SALES

300 sets at \$150	\$45,000
50 per cent trading ratio—150 used radios to sell—	
100 used radios at \$20	2,000
50 used radios at \$56	2,800
300 sets of tubes at \$27 sold with sets	8,100
Parts and tubes sold for service and repairs at \$5 per set	1,500
Accessories at \$2 per set	600
Labor—	
One man on payroll 300 days a year, one third of whose time is sold to customers at \$1.50 per hour—800 hours at \$1.50 per hour	1,200
Total sales	\$61,200

	New Radio	Used Radio	All tubes and parts sold	Accessories	Labor	Total
Sales	\$45,000	\$4,800	\$9,600	\$600	\$1,200	\$61,200
Cost of goods sold	27,000	6,300	5,760	360	600	40,020
Gross profit	18,000	1,500	3,840	240	600	21,180
Less total expenses		17,370				
Total operating profit		3,810				
Deductions or additions to income		210				
Net profit						3,600
Net profit per set						12

see where his money goes. A dealer of this class would probably be his own manager, on a moderate salary, and have five or six outside salesmen on a small salary and straight ten per cent commission on sales over and above \$750 a month. His money would probably be distributed something like the accompanying tables.

This is a complete picture of an average dealer business, and practically all the items involved would remain whether the business were smaller or larger. In the latter case there would of course be other expense due to an increased selling organization and the addition of salaried executives. The three-hundred unit dealer and upward form the most desirable exclusive organization from the distributor's standpoint. Below that limit there is a tendency for the dealer to take on some other lines of merchandise to bolster up his turnover and justify the retention of all the help and the facilities necessitated by the demands of a progressive radio retailers business.

Down in the fifty-to-one hundred set class are the part-time dealers, so often found in music stores, general merchandise stores, electrical dealers, and radio set builders businesses. Except in the last-mentioned case it is not often that the owners' aspirations exceed this financial capacity for they are usually seasoned business men, albeit in a small way. It is the man with the limited capital and little else that is the thorn in the side of the distributor.

As the above figures show it is possible, with a cash fund of \$4860 to make use of credit facilities, with the help of the bankers, and so increase the available operating capital to over eight thousand dollars. By so doing the operator is not cramped for ready cash and can add to his profit by discounting his bills. Careful management, and the exercise of a degree of business acumen will then enable him to show a net profit of at least twenty per cent, and often considerably more.

The point to be observed however is that it takes money to make money, and as much of that money as possible should belong to the operator. This is particularly important in the radio business where such a large proportion of sales involve installment buying. Financed sales mean considerably less profit for the dealer, because the borrowed money is expensive and the balance withheld by the finance company not only carries

no interest, but is not available for use in the business.

Some few poorly-financed dealers have got by in the past, but that was before radio became the billion-dollar business that it is to-day. Now that big business has taken hold of it, the larger manufacturers are dominating the national field and the force of their efforts is being felt in even the smallest communities. Competition to-day therefore is keener than it has ever been because intensive and intelligent merchandising methods are being used.

As the bigger manufacturers are squeezing out the smaller ones, so are the well-organized, financially strong dealers making it difficult for the man operating on a shoestring to exist except for a brief time by unethical methods such as price-cutting. Much can be said in favor of the Big Five of radio, however. They are reducing radio merchandising to a science and building up their dealers to the benefit of both. They install definite tried sales plans and sell the method of doing business as well as the merchandise. At least one of them gives their dealers 100 per cent financing, with protection on trade-ins, while they are all generally raising the standard of retail selling to a point where the success of the individual dealer is practically assured and the future of the industry safeguarded from economic upheavals that would threaten its prosperity.

THE foregoing recapitulation makes no specific provision for the dealer's financing one-third of the installment

sales himself. The \$1000 in cash and the \$2800 in accounts and notes receivable would be inadequate to cover the requirements of a business selling 300 sets a year, as a brief analysis will show.

Assume that a dealer finances 100 sets a year at an average price of \$150 per set and that he receives a twenty per cent down payment which he uses to reduce his capital requirements. The amount of capital required depends upon the number of monthly payments necessary to clean up the balance due, eight, ten, or twelve being customary in the radio business.

For a twelve-payment plan, self-financed sales of \$15,000 a year would require a total of \$6500 in cash or credit. From the average sales of \$1250 per month, \$250 would be secured from down payments, thus requiring \$1000 per month to be financed as follows:

Capital Requirements for Deferred Payments of \$1000 per Month, Payable in 12 Months

Month	Payments Due	Capital Required	Total Investment
1st	\$ —	\$1000.00	\$1000.00
2nd	83.33	916.66	1916.66
3rd	166.66	833.33	2750.00
4th	250.00	750.00	3500.00
5th	333.33	633.33	4166.66
6th	416.66	583.33	4750.00
7th	500.00	500.00	5250.00
8th	583.33	416.66	5666.66
9th	666.66	333.33	6000.00
10th	750.00	250.00	6250.00
11th	833.33	166.66	6416.66
12th	916.66	83.33	6500.00
13th	1000.00	0	6500.00

With a ten-payment plan the same amount of self-financing can be accom-

plished with \$5500, as shown in the following table:

Capital Requirements for Deferred Payments of \$1000 per Month Payable in 10 Months

Month	Payments Due	Capital Required	Total Investment
1st	\$ —	\$1000	\$1000
2nd	100	900	1900
3rd	200	800	2700
4th	300	700	3400
5th	400	600	4000
6th	500	500	4500
7th	600	400	4900
8th	700	300	5200
9th	800	200	5400
10th	900	100	5500
11th	1000	0	5500

Likewise with an eight-payment plan a similar analysis will show that \$4650 capital is necessary to handle deferred payments of \$1000 a month.

These unit figures are also useful in showing the monthly and the total cash or credit reserve necessary to handle deferred payments of any amount. Thus deferred payments of \$100 per month would require one-tenth the capital that is necessary for \$1000 per month, \$500 per month would require five-tenths the capital, etc.

Quick figuring will show that a dealer who plans on selling 300 sets a year should have at least \$15,000 cash and credit in order to make a go of his business. Many dealers have been successful with far less initial capital, but in this new decade of radio selling real profits will come chiefly to the dealer who is adequately financed. Obviously a \$1000 shoestring is inadequate.

Simplified Bookkeeping System for Radio Dealers



By G. S. CORPE

IN my work of calling on radio dealers I am impressed by the fact that seemingly no part of their businesses is so neglected as their records—bookkeeping, in other words. I find many good merchandise displays; many excellent service departments, etc.; but usually when it is desired to look up an invoice or check a copy of a customer's sales contract, there is a big hub-bub in the office and nothing can be found where it should be. Records of business transactions of all kinds are more often than not in an absolutely hopeless condition.

With the hope of rectifying this condition, I am going to present in complete

detail a system of bookkeeping for radio dealers, covering everything "from soup to nuts," and especially adapted to the radio business. This set of books has already been installed in a large number of dealers' stores, and believe me, you couldn't get them out of those places on a bet. After you, or any dealer or repairman once keep a set of real books for a few months you will wonder how in the world you ever got along without it.

Every dealer is especially urged to give this system a try-out for two or three months—even if you now have what you consider good books, carry this one along in conjunction with the other

for a short time, so that you will fully realize how simple and complete this set is. And you will be ready by the first of the coming year to be using the system, have it running smoothly, and be set for real, satisfactory, complete records from then on.

One especially satisfactory feature of this system is its great flexibility. It will function one hundred per cent efficiently in the biggest radio jobber's business or it will fit perfectly into the picture for a little one-man, part time repair business; or anything in between. If your business is small, you or your wife can keep the books, thoroughly and completely in only a few minutes each day. If your

June 1930		Income Debit						
Date	Name	Explanation	Misc	Change	All Cash	Notes	Interest	
				Amount	Received	Receivable	Discount	
1	6 1	Cash Sales				38 80		
2	6 1	J.P. Waldron on a/c				12 25		
3	6 1	J.G. Montgomery on a/c for tubes				10 00		
4	6 1	P.J. Cooney repair set order #171		11 50				
5								
6		Totals		11 50		61 05		
7								
8	6 3	Cash Sales				12 50		
9	6 3	J.W. Bentley Radiola 66 order #13 used set	20 00		30 00	107 00		
10	6 3	Sold Bentley Contr. to Coast Ten Co. I.O.U.	20 00		80 00		7 00	
11			40 00		22 50	107 00	7 00	
12			40 00	11 50	183 55	107 00	7 00	
13								
14	6 4	Cash Sales				62 00		
15	6 4	American Exp. P.J. Sullivan Order #176		7 50				
16	6 4	E.E. Tutin. Returned motor	6 00					
17	6 4	E.C. Harvey Pd Note less Disc #200				103 00	1 00	
18	6 4	P.J. Cooney Pd a/c	Labor	1 00		10 50		
19				7 00	7 50	175 50	2 00	
20				47 00	19 00	359 05	9 00	
21		Used Set	20 00					
22		I.O.U.	20 00					
23		Accs	6 00					
24		Labor	1 00					
25			47 00					

Left Side of Fig. 1

business is so large that you have two or three bookkeepers this system will give you faster and more complete results and lessen the cost of keeping records.

Here are a few of the things you can ascertain, practically at a glance: cash balance in bank; amount you owe jobbers; amount due you from customers; amount customers have paid you on account; amount of sales, separated into departments; expenses and purchases for the business as a whole as well as its individual departments; turn-over data; etc., etc., etc.

WITH this introduction and reason for both the writing of this article and the studying and following of it by every dealer, let's proceed. The first requirement is a book with several columns on each side of the sheet. It may be anything you desire to buy, from a paper-backed 15c book to a large loose-leaf proposition. An easy and economical way to start is to buy loose-leaves,

only, and use them rather than any book.

In the front of the book we are going to put our income record; about half way through the book we will start our expense record.

It is necessary to "detour" for just a moment here. Every business needs some sort of cash register or something to serve for one. It's O.K. if nothing more than a cigar-box and a piece of wire hung on the wall to take your sales tickets. These latter can be either just plain pieces of paper or regular printed sales tickets. Anyhow, for every cent taken in by the business, write the amount and what it is for on something and file it until ready to enter it in the books. Another thing at this point: Put every cent you take in in the bank; pay out every amount by check, and check only. Do not take cash out of your cash receipts in the cash box or cash register and pay bills or freight or anything else with it. That item will be taken care of farther on, so don't get worried about

having to write a check for 19c to some poor expressman—he will get his money okeh just a little later, and without you bothering to write such a small check, either.

Now, with the above points understood, we are ready to proceed with some actual bookkeeping.

Head up your columns on the income (front) side of the book about like Fig. 1. If there are some things listed in the right-hand side sheet that you don't sell, leave them off. If you sell a considerable amount of something that makes you think it worthy of a "Department" head up a column for it. The ones listed in Fig. 1 are pretty generally used in most ordinary radio stores and will fit possibly 95 per cent of all. Don't blame us, though, if you sell sewing machines in your particular business and fail to find a column for them.

Now turn to the middle of your book and head up the columns according to

June 1930		Expense Debit						
To Whom Paid or Name of Account & Explanation	General Expense	Parts & Accessories	Complete Sets	Labor	Misc	Post or Explain	Account Paid off	
1	London Rent for Month	75 00						
2	F.H. Houser Co Invoice dated 5-1-30		30 00		40 00			
3	Robt Rankin salary to 5-1-30				35 00			
4	Fred Putnam		10 00		25 00			
5	P. Dustin & Co May a/c	75 00	30 00	10 00	40 00		31 00	
6					60 00		20 00	
7						10 00	Petty Cash	
8		2 80	1 50	4 20	1 50			
9		77 80	31 50	14 20	41 50	10 00	51 00	
10								
11						10 00	Petty Cash	
12								
13								
14								
15								

Left Side of Fig. 2

Income - Credit										June 1930			
Date	Name	Explanation	Used	Sets	Account	Misc	Total	Complete	Labor	Parts +	Sheet	Pianos	
								Tubes		Accessories	Music		
1								20.00	8.80	10.00			
2							12.25						
3							5.00						
4							3.00	5.00	3.50				
5													
6							28.00	13.80	13.50				
7													
8							2.50	5.00	5.00				
9							130.00	20.00					
10													
11							130.00	22.50	5.00	5.00			
12							130.00	50.50	18.80	18.50			
13													
14									30.00	30.00	2.00		
15								7.50					
16													
17													
18													
19								7.50	30.00	30.00	2.00		
20							130.00	58.00	48.80	48.50	2.00		
21													
22													
23													
24													
25													

Right Side of Fig. 1

Fig. 2. This you will see is the Expense and Paid Out Record, the first having been the Income and Received Record.

WITH all this done, we are ready to start. First, take all your little sales slips of the day before and pick out those that represent cash sales. Write each amount on a piece of scratch paper and add them up. Suppose they total \$38.80. As you are adding them, and working over them, separate them into different amounts, according to what the cash was taken in for. In this instance, let us suppose you sold \$20 worth of tubes; Labor \$8.80; and Parts or Accessories \$10.00. At the extreme left side enter the date (6-1) then under the column headed "Name" write in "Cash Sales"; then under "All Cash Received" the total amount \$38.80. At the right enter the respective amounts in each proper column. This completes our Cash Sales Entry.

Next, we find a ticket that states that J. P. Waldron paid \$12.25 on account. On line 2 write the date; his name; under "All Cash Rec'd" \$12.25; and over on the right page under "Paid On Account" put the amount \$12.25.

Next (to get a little more complicated entry) suppose J. G. Montgomery pays \$5 on account and also buys \$5 worth of tubes, paying cash for them. Possibly you have already extracted the latter \$5 and worked it into the other cash sales; if so, okeh; if not, run it through as per line No. 3.

Refer now to line 4. It will simplify matters if you will put an order number on each repair order and on each invoice sent your customers; and enter that number along with his name and explanation. You will notice this is done on line 4—Order No. 171. Using a piece of scratch paper, itemize the amounts out of each repair ticket just as you did with the cash sales. After

this is done and the totals made to balance with the total amount of the ticket, write on the ticket (anywhere where there is room) the list of things furnished and the amount. Then transfer this to line 4; Mr. Cooney's invoice, or Order No. 171 totals \$11.50, and was for: Tubes \$3; Labor \$5; Parts and Accessories \$3.50.

Before going farther and getting into more complicated entries, we better stop and catch our breath and look things over. Let's presume that these entries constitute a day's business. After leaving a blank line (line 5) total up each column, as is done on line 6. Look who's here! We see at a glance that we have charged up \$11.50; taken in cash \$61.05; collected \$17.25 on account; and sold \$28 worth of tubes, \$13.80 labor, and \$13.50 parts. Not a bad day's business. In fact, probably better than many actual days, but I hope you have many even better than this example.

Expense Credit										June 1930	
Date	Name	Explanation	Post or	Misc	Post or	Charge	Check	All Cash	Total	Total	
											Explain	Explain	Amount	Number	Said
1							101	75.00			
2							70.00				
3							102	35.00			
4							103	35.00			
5							104	115.00	50.00		
6											
7							105	10.00			
8											
9											
10											
11											
12											
13											
14											
15											

Right Side of Fig. 2

The totals on line 6 better be put in your books with a different colored ink; use red or any other color you wish. This makes the totals stand out and easier to read.

I want to invite your attention now to the fact that the total of the totals (line 6) on each side should balance. That is, \$11.50 plus \$61.05 is \$72.55. Likewise, \$28 plus \$13.80 plus \$13.50 plus \$17.25 is \$72.55. *This proves that your entries are correct.* A system permitting each side to balance in this way is called DOUBLE ENTRY BOOKKEEPING, and that is what this system is—both on the INCOME and EXPENSE sides.

Now another word of explanation. At the top of the left sheets you see the word "DEBIT," and on the right sheets the word "CREDIT." Let's get these seemingly technical terms reduced to common English. Without getting worried about the actual dictionary definitions, may I say this: When cash was received by the business, what effect did that have on the business? Obviously, to receive cash the business had to *put out* either tubes, labor, or parts. So for our purpose let's say this: *We will debit whatever is received by the business; and we will credit whatever the business puts out.* This will apply, as you will shortly understand, to both the income and expense sides of the books. Anyhow, on both the income and expense sides of our books the DEBITS will be on the left page and the CREDITS on the right page. Let's not forget that, as the whole secret of double entry bookkeeping depends upon proper entering of Debits and Credits. It has to, because it is based upon the self-evident fact that *for everything received by the business equal value must be put out.* That's simple, isn't it? For example, if the books show we take in \$10 cash they must show what we *put out* for that \$10. In that way the balance on each side is retained and correctness of our entries ascertained, as previously explained.

As a last word on this apparently dry subject, may I tell you that almost every entry can be properly doped out and easily understood and properly made by asking yourself the question: "What does the business get in, and what does the business put out?" The correct entry lies in the answers to these questions. Debit the first answer and Credit the last answer. That's all there is to DEBIT and CREDIT.

BEFORE we get into any deeper "politics" on the income side, let's take a shot at the expense side (see Fig. 2.) It is just the same as the income side; except that the columns are so headed as to take care of money paid out and goods purchased, rather than taking care of money received and goods sold as the

income side is. The DEBITS are still to the left and the CREDITS to the right.

Since it is the first of the month, probably the first thing we will have to do is to pay the rent. Let's presume that, in fact, several checks have been written, and we are going to enter them into our expense side.

On the first line (Fig. 2) we will enter the rent check. Our store isn't a very big one and the rent is only \$75.00. Enter that amount under "All Cash Paid" at the right side of the book; just to the left of that enter the check number. What did we pay that \$75 for? Rent. What Department is rent, anyhow? Answer: No Department. Rent is General Expense. All right, enter the \$75 on the left side under General Expense. In the column headed "To whom Paid or Name of Acct. and Explanation" enter: Landlord—Rent for Month.

Let's divert again just a moment. General Expense will cover any item that cannot accurately or fairly be assigned to any one certain department. For example, Rent is here put into General Expense; but if you rented a room somewhere for repairing sets only, I think the rental of that room should be properly charged to Repairs or Labor. In this instance, however, we not only use the store room for repairing, but also to sell sets and tubes and parts out of; so the rent is legitimately General Expense. Your common sense will tell you what is and what is not General Expense.

Now for line 2. F. H. Houser Company has sent us a shipment of parts and tubes. The shipment has been received in good shape and the invoice checks with the shipment. The thing to do next is enter the invoice, after itemizing (exactly like we did on the Sales Slips on the Income Side) what we bought. Let's say that the whole bill is \$70, and that \$40 of it is for tubes and \$30 for parts. If you want the experience, ask yourself the question about Debit and Credit. What did the business *receive*? Tubes and parts. What did the business *put out*? Nothing, but we of course are under obligation to pay the bill some time; so we make the Credit entry under the column "Charge Amount." This means that we *owe* that amount, and therefore what the business *put out* was an agreement or obligation to pay. If this is clearly understood, we will enter on line 2 in the "Charge Amount" column \$70, and over on the left sheet enter \$40 under tubes and \$30 under parts.

Line 3 carries a simple entry; we have paid one of our repairmen who works for us \$35 by check No. 102. We debit Labor, because when he does a repair job the amount thereof is credited to Labor on the income side; therefore

we pay him and charge his salary to Labor.

Line 4 is a little different. This man receives the same pay-check, \$35, but through the week we have kept track of his time and he put in \$25 at regular labor for which we receive pay, but the other \$10 of his time went into assembling and possibly servicing new sets; therefore \$10 is debited to Complete Sets, and the other \$25 debited to Labor.

After entering a batch of checks and invoices, total up all columns and see that the debits and credits balance okeh. Put your totals in small figures, up close to the last line of entries, as shown on line No. 5 (also 9). We do not need a full line set of totals on the expense side because we do not run the expense side on a daily basis, as we do the income side.

At this point let's more or less summarize our conditions as shown by the books. We have paid out cash in the amount of \$145.00. Our income side shows that we put in the bank \$61.05. All right; add your balance the first of the month to the income of \$61.05 and deduct the paid out sum of \$145 and you have your bank balance in a moment.

Other figures are, of course, likewise applicable, although at this point in keeping our books it is of hardly as much importance as realizing the simplicity of getting our bank balance in a hurry. I think it better that we pass up the other figures temporarily—you will use them for analysis and checking up at the end of each month more than any other time.

To get back to our Income Side and get some slightly more complicated entries. For the next few paragraphs we will be talking about the Income Side beginning with line No. 8. This is another day, so we will first summarize our Cash Sales exactly as we did before. These entries are on line 8.

On line 9 we take care of a Set Sale. Before starting to enter your set sales, itemize the figures on them and scribble them down somewhere on the sales slip, as we did on the cash sales, or the invoice from Houser Co. (line 2, Expense Side). Let's suppose the customer bought a Radiola 66, total price \$150, of which \$20 was for tubes and \$130 for the set. He pays down \$30 in cash and turns in his old set for \$20; that leaves him owing us \$100. He is going to pay that out in ten months, and the carrying charge for that time is 7 per cent; so that he owes us \$100 plus \$7, or \$107. I have always found it a good idea to figure a deal of this kind out in pencil first, getting things all into balance, and then type up a regular sales slip in duplicate, giving the customer a copy and filing the other copy for entering in the books. This is shown in Fig. 3. Also, the method of scribbling down the accounting figures previous to making the book entry is

EXCHANGE RADIO COMPANY

San Francisco, Cal., June 3, 1930.

Mr. J. W. Bentley,
48 Fourth Avenue, City.
Radiola 66 and tubes, complete.....\$150.00
Interest on Contract..... 7.00

Total\$157.00
Paid by:
Cash\$ 30.00
Used set..... 20.00
Contract 107.00

Total\$157.00
(Contract payable at \$10.70 per month for 10 months.)

Dr.		Cr.	
Cash	\$ 30.00	Comp. sets.....	\$130.00
Used set.....	20.00	Tubes	20.00
Notes Rec.....	107.00	Int.	7.00
	<u>\$157.00</u>		<u>\$157.00</u>

Figure 3

shown. After being sure the Debits and Credits are correct, it is of course easy to enter them on the books; this entry being taken care of on line No. 9.

Next, we sell Mr. Bentley's contract to the finance company. They give us \$80 in cash; their I. O. U. for \$20, and discount the paper \$7. The entries are shown on line No. 10, and are easily doped out by applying the old rule about Debits and Credits. The business receives \$80 cash, \$20 I. O. U., and \$7 discount. (Don't laugh—we didn't really receive \$7 discount, but for our books we get the same effect.) The business puts out a contract for \$107.

Another "detour" is in order here. Many dealers just carry their amounts due from the finance companies along with other notes and contracts which are being carried. This is, of course, okeh, but I believe separating them is well worth the extra trouble. You will remember that in the past when you have made a statement of your business to your bank you have been required to separate "Quick Assets" from "Other Assets." Meaning, of course, the items which can be rapidly and easily turned into cash for the former and for the latter items which are worth money but the nature of which is such that they cannot readily or quickly be used to realize cash upon. Just so with the I. O. U.'s from the finance company and other contracts or notes due you; better keep a separate account of them, as the I. O. U.'s from the finance company may be depended upon to turn into cash at a later date, without fail. You may handle this matter as you think best; but for our set of books here we will keep them separate. However, both will be called "Notes Receivable."

Now let's proceed on the Income Side. On line 14 we have the summary of the day's Cash Sales as in previous examples. On line 15 we have a different entry. A customer with whom we are only slightly acquainted is on a vacation trip with his portable along and has wired us to send him three UV 199 tubes, c.o.d. We do so; and in-

asmuch as the shipment went c.o.d. we charge the express company with the shipment, rather than the customer, because it is the former we will look to for payment. Had we known Mr. Sullivan better we probably would have been asked by him to ship the tubes on open account, in which case we of course would have charged them to him rather than the express company.

Next (line 16) we have tried previously to sell a meter to E. E. Tutin and have left it with him and charged it to him (before we started this set of books). But he decides he cannot afford it and returns it. Before making the entry, let's ask ourselves the famous old question about Debits and Credits. What did the business receive? The meter—an accessory. So we Debit in the Miscellaneous Column \$6 and mark it at the left "Accessories." What did the business put out? Well, the customer's account is lessened by \$6; the business "put out" \$6 worth of accounts receivable. So of course we Credit Customers Accounts \$6. I hope you won't have many articles returned, necessitating entries like this; but since we all have them occasionally, it is necessary to know how to make the matter show properly on the books.

Now for line 17. Mr. E. C. Harvey owes us a note of \$105 which we agreed to carry without any interest provided he paid it when due. He feels that he has not been treated quite properly on some past work, and in order to smooth the matter over pleasantly with him, we suggest a \$2 discount on the note, to which he agrees. He therefore pays us cash \$103, rather than \$105. We debit All Cash Received \$103; Discount \$2; and of course Credit Notes Receivable \$105; all as per line 17.

If you make a similar adjustment on a customer's account (that is, by discounting it) it is better to debit the discount to whatever is responsible for the necessary discount. An example is on line 18, where the customer complained of being charged with too great an amount for labor. On line 4 we charged Mr. P. J. Cooney with Order No. 171; now on line 18 we make the entry where he pays this account. He has complained that \$5 was too high for labor, and after checking up the matter we find that he is right and agree to discount the bill \$1; therefore, in the Miscellaneous column we Debit Labor \$1 and Cash Received \$10.50; and of course Credit Accounts Receivable with the total of \$11.50.

You won't have many complaints or adjustments like this if you are careful to have the prices right in the first place; these entries are given only so that you will understand how to make them when necessary.

Let's say that this completes the entries for this date; we total the day's entries on line No. 19; and then total

today's entries with the previous totals on line No. 20, as was previously done on line 12. Do this after each day's entries are completed.

Most of the ordinary entries for the Income Side have been demonstrated by now; so let's next pretend that the entries finish the month, and get our columns summarized. Using scratch paper, set up little temporary headings and itemize the amounts on the Debit side in the Miscellaneous column. It happens that we have but four of these in our sample sheet, and they are all different; so just write them down below the Miscellaneous column, as is done on lines 21 to 25, inclusive. The other columns on the Debit side are each already separated or "departmentized" okeh, so we need not touch them.

On the Credit side we find all columns already separate and clear until we come to the Miscellaneous column; itemize the figures in that column on scratch paper and transfer them to the book as shown on lines 21, 22 and 23.

This completes the month's work on the Income Side. The reasons for itemizing these Miscellaneous columns will be fully explained when we come to working on a General Ledger; suffice it to say here that these columns are itemized in this manner to facilitate transferring all totals to the Ledger—to be fully explained later.

Now let's make a few more entries of different kinds on the Expense Side and then close that up also, pretending that it is the month-end.

On line No. 5 we make the entry for check No. 104, in which we pay P. Dustin & Co. the account of \$31 we owe them—by cash \$30 and discount \$1. We, of course, Debit Accounts Paid Off \$31 and Credit All Cash Paid \$30 and in the Miscellaneous Column Credit the other \$1, marking it "Discount."

On line No. 6 we take care of an entry which you may have occasionally. We will suppose that some time previous (not shown on these books) L. J. Roby left with us an electric clock on trial. In order to keep track of the matter properly we entered the shipment on our books but finally decided to return the clock and not try to sell it or keep it in stock. After asking ourselves the standard question about Debits and Credits we decide that the business puts out accessories and that the business receives the equivalent \$20 by being in debt or owing that much less; in other words, we pay L. J. Roby by giving him merchandise, rather than cash. The effect is that we owe him \$20 less than we did before doing so. Therefore we debit Accounts Paid Off.

We previously mentioned that it is easy to put every cent received into the bank and to pay out all money by check, but still not have to write

many small checks. The way to handle this is to write a check to Cash for say \$10; cash this check, and put the \$10 in a separate compartment (that is, not with your other regular cash and change) and pay small amounts out of this cash. Keep a slip of paper in the box with this Petty Cash and on it write all amounts paid out. When the Petty Cash gets low, separate the amounts into proper departments, enter as on line 8 (the check for getting Petty Cash is entered on line No. 7) and write another check for Petty Cash, repeating this as often as necessary.

We will suppose that all the original \$10 was paid out, and that the record of how it went out looks like the upper part of Fig. 4. (In actual practice you

PETTY CASH RECORD

6-1-30	In \$10			
6-1-30	Pd. Keystone Express on tube shipment			.35
6-1-30	Pd. American Express Co. on advertising blotters		2.80	
6-3-30	Pd. Freight on sets		4.20	
6-5-30	Pd. Freight on tube shipment		1.15	
6-8-30	Pd. Motor Transit Co.—shipment of parts		.95	
6-8-30	Express on accessories		.55	
		<i>General Expense</i>	<i>Complete Sets</i>	<i>Parts and Accessories</i>
<i>Tubes</i>		.35	2.80	4.20
		1.15		.95
				.55
				1.50
				1.50
				2.80
				4.20
				1.50

Total—\$10.00

Figure 4

will pay only very small amounts out of the Petty Cash Account; in the examples we used larger figures rather than a large number of very small amounts merely to explain the working of Petty Cash — and to avoid boring you with many small entries. We separate the amounts into respective columns as shown on the lower part of Fig. 4, and arrive at the amounts to be Debited—Parts and Accessories \$1.50; General Expense \$2.80; Complete Sets \$4.20; and Tubes \$1.50—totaling \$10; the amount Credited in the Miscellaneous Column to Petty Cash.

The importance of handling this matter in this manner cannot be over-emphasized. In order to easily keep track of receipts and expenditures and profits or losses, *put every cent you receive into the bank, and pay out every cent by check—except Petty Cash payments as above explained.*

THESE few examples will cover all that is necessary on the Expense Side, I think. After totaling all our columns (line No. 9) we itemize both Miscellaneous columns and enter the items under the Total figures (line 11 on the Debit Side; lines 11 to 14, in-

clusive on the Credit Side.) Let us say that our Expense Side is now closed for the month.

Now, just as we previously did and can do at any date through the month, we can quickly get our cash balance by adding our cash in bank on the first of the month to the amount "All Cash Received" and deducting "All Cash Paid." Or we can easily and quickly get similar figures for any other account.

At the beginning of each new month, start each side (Income and Expense) on a new, fresh sheet. Totals are brought forward from day to day through a month, but for each month separately, and no totals are brought up from one month to another.

To easily keep a continuous, complete record, it would be easier to have a separate sheet for each account (independent of our so-called Cash Book) and at the end of each month post the totals of Debits and Credits from both the Income and Expense sides to this sheet. After posting, they would be "balanced," which means that all Debits would be added together; all Credits added together; and the smaller amount subtracted from the larger to arrive at the amount of Debits over Credits, or vice versa.

But if we run these on loose sheets they will be hard to keep track of, will be getting lost or mixed up, etc.; so it is customary to keep the sheets in a loose-leaf binder with an alphabetical index to facilitate finding accounts; and this is nothing more nor less than what is commonly called a GENERAL LEDGER.

In a forthcoming installment full instructions for using a Ledger will be given and I assure you it will be just as simple and easy to handle as the Cash Book already explained.

Meanwhile, fix up some sheets and use what has already been explained. Many dealers use this portion only, and find themselves well repaid for the effort. Highly interesting and valuable figures can be obtained from these records alone, without any ledger. So set this system up and use it for a month, when further data covering the ledger will appear.

Questions and Answers Relating to the Radio Bookkeeping System

Q. How much will it cost me to install this system?

A. That depends upon how expensive a cash book you purchase. Loose leaves with nine or ten columns are suggested at first; then you may buy a binder for them later. Fifty cents worth of these sheets from your stationer should run a small business for months.

Q. How do you make an entry for paying yourself?

A. Every proprietor of a radio business should pay himself a definite, fixed salary per month. The amount should be commensurate with the size of the business, and the dealer should absolutely live within that salary. As a rule, the proprietor's salary

will be charged (debited) to general expense.

Q. When or how often should I make entries of receipts and expenditures (in cash book)?

A. The frequency of making entries on the income side will depend upon the size of the business. A large business will require a set of entries complete each business day, and very often will use a full sheet for each day's entries. A small business may not require more than one set of entries per week. One thing that applies to any business, regardless of size, is this: Make all entries and have the books in balance before making *any* bank deposit. You may occasionally have one single entry to take care of a certain deposit, as, for example, should you borrow money from your bank, or your bank make a collection for you and send you a deposit slip to cover it. Try to keep the totals in your cash book in exact sequence with the entries in your bank book.

Entries on the expense side will also depend upon the size of your business. It is best to keep checks closely entered up, and also invoices. Don't let too many of them accumulate before segregating them into departments and entering on the books.

Q. How do I keep track of each separate customer's account?

A. For an ordinary business have your bill heads printed and bound in a loose-leaf book in duplicate. The duplicate sheets need not be printed. After making entries in your cash book, transfer the customer's charges and credits (the latter being amounts paid on account) to this "customers' account ledger." At the end of the month you may be sure of the correctness of your entries by adding all balances in the customers' ledger and their total, of course, should equal that indicated by the cash book.

Q. How do I keep track of invoices for bills due to jobbers and others?

A. For a small business I suggest an ordinary file with a board back and an alphabetical index. Put a sheet of blank paper in the file for each account, and after invoices are entered on the expense side of your cash book make an entry of the amount on the sheet for that account and file the invoice with the sheet. Later, if you install the general ledger to be described in the next issue, you will have in that an account sheet for each account payable, and can therefore dispense with the sheets mentioned here, although you will probably still wish to file the invoices as per above. You will find it a big advantage to have one file for unpaid invoices and another for those you have paid, transferring them at the time you pay them.

Q. I notice most complicated bookkeeping systems mention a journal, cash book, day book, etc., etc. What about these?

A. The book we have been explaining is all these in one—and more. A journal is a book for daily entering of transactions of the business. You will understand, of course, that this is taken care of with our system. A cash book is kept by many businesses to keep a record of money put in the bank and paid out; our system automatically does that. In addition this system handles your accounting by separating the different departments of your business. All these statements apply to both the income and expense sides of the book.

Q. What other books do I need for this system?

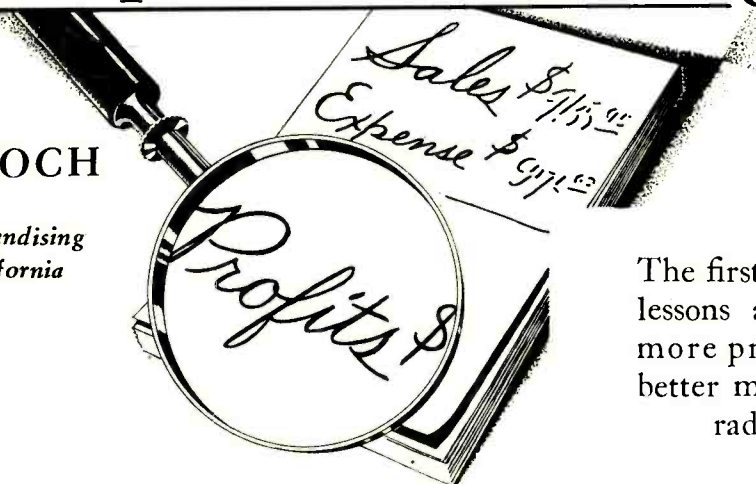
A. The book used for income and expense records is the key book. A general ledger will likely be desirable later. Customers' ledger, as already explained in these Questions and Answers, is desirable. The bank furnishes your bank book. A paper-backed 15-cent book for making trial balances may be added along with the general ledger later. This is all.

(Continued on Page 52)

PROFIT PROMOTION *through* Proper Store Management

By WILLIAM E. KOCH

Associate Professor of Merchandising
University of Southern California



The first of a series of lessons about making more profit through better management of radio stores.

TAKE any continuously successful radio store or other business. Analyze it carefully. You will find that it is pulled along on its progressive journey of success by a powerful "team." Suitable names for this team are Sales Promotion and Profit Promotion.

Sales Promotion aims at a greater volume of sales from a given trade territory. Profit Promotion aims at a greater volume of profit from a given volume of sales.

When both are fundamentally strong and in healthy condition, they need only be hitched together properly and driven effectively. They will then pull the business to its logical goal of maximum profit—the *largest volume of profit the business is capable of producing in the long run.*

The essentials of profit promotion are found in modern methods of management, through which the sales volume is made to reach its real goal—PROFIT VOLUME.

Fundamental Problems in Management

WHATEVER the technical peculiarities and specific problems of the radio store may be, the radio dealer is a retailer. His fundamental problems in management and profit promotion are exactly the same as those that confront any other retailer.

Mention of this obvious fact would be useless, of course, were it not for this one especially important consideration:

Fundamentals in modern methods of management have a lot to say about whether or not the business is to be a continued success, and whether or not it is to yield all the profit it is capable of yielding.

THE WINNING TEAM

Sales Promotion and Profit Promotion make the winning team. The driving force is in management. The essentials of Profit Promotion are found in modern methods of management. Fundamentals in management are demanding more and more studious attention. Planning comes first, followed by action and control. A practical test for the bedrock of management.

We are now starting on a course which aims to present the fundamentals in profit promotion or modern methods of management from the viewpoint of the radio retailer, and to stimulate thinking about them and their profitable application to the needs of the radio store.

The course can prove helpful and profitable only in proportion to the analytic thinking each individual radio retailer does about the advantageous application of the basic principles to the particular demands of his own business. We all know too well that such thinking, though tremendously important, often is neglected through the ceaseless press of daily operation.

As a result of this unintentional neglect, at least some of us may be working under an unsuspected handicap. Basic principles are quite as inevitable in their influence as the laws of nature. They frequently bring their constructive or destructive consequences (it must be one or the other) without definite recognition of the cause.

That is why our fundamental problems in management demand more and more studious attention as our commercial structure becomes more complex, and our competition more severe. It all gets down to this eternal fact. *The*

greater the odds against us, the better must be our management.

The Trend in Sales Study and Profit Study

BY WAY of illustrating the powerful influence of basic principles when clearly understood and properly applied, let us briefly consider the developments of recent years in salesmanship and sales promotion.

The process involved in making a sale began to be analyzed and studied in earnest some thirty years ago. The "mental steps" in every sale were discovered. Basic principles were recognized and "put on the job." The development was gradual, of course; but *effective.*

Nobody knows the extent to which the recognition and understanding of the "mental law of sale" are responsible for the remarkable improvement in salesmanship and sales promotion since 1900. Nobody knows the extent to which the basic principles in salesmanship are being applied.

Every careful observer knows, however, that the benefits are enormous; and that greater and greater benefits will come because salesmen and sales managers are devoting themselves more and more seriously to the study of fundamentals in salesmanship and sales promotion.

But our justly enthusiastic study of the selling process seems to have overlooked, at least to some extent, one particularly important bet. As a group, we have taken it entirely too much for granted that our sales were producing the expected profit. It is high time to turn our thinking more definitely to the profit-producing phase of our selling.

Not that we are to give *less* attention

to selling methods, but *more* attention to modern methods of management and control. Why? Because it always is the character of our management and control that determines the *volume of profit* we produce from a given *volume of sales*.

Do you know of anything more urgently needed than *practical profit promotion* in the field of radio retailing right now? Think it over. It's darn well worth thinking about.

Three Basic Essentials in Profit Producing

WHEN we dig right down to the *bedrock* of the profit-producing process, we find that the basic essentials are exactly the same as in every other producing process. The finished product must be visualized or pictured in the mind; the necessary physical effort must be applied; the result must be checked and proved to make sure that it is as we intended it to be.

We have, therefore, three *basic essentials* which apply to the producing of merchandising profit, just as they do to the producing of anything else. Yes, they apply as much to *profit producing* in the retail radio store as in any other kind of business. Expressing these basic essentials in single words, we have:

1. **PLANNING** (determining *what* is to be done, and *how*).
2. **ACTION** (doing it).
3. **CONTROLLING** (making sure that it is done as planned). Of course it is possible to manage a radio store in a way, without definitely recognizing these three basic essentials in the profit-producing process. So is it possible to make sales, in a way, without definitely recognizing the mental steps in the selling process.

In no instance, however, is a business managed or a sale made without *following* the basic essentials either consciously or unconsciously, and in one way or another. Results always depend upon the *way* the basic essentials are applied.

No customer ever makes a purchase without having passed through the successive mental stages—*attention, interest, desire, resolve*. No business ever is managed, no product ever is produced, without applying the three basic essentials in production—*planning, action, control*.

And that, in a nut shell, is why it pays so *big* to recognize the basic essentials *definitely*, and apply them *consciously*.

Theory? Yes, of course. But remember—*always* remember—that nothing can be sound in *practice* until it is sound in *theory*.

You readily will agree that radio retailing needs sound *theory* right now,

especially in its Profit Promotion, to make its practices more profitable among the great rank and file—the real *backbone* of the industry.

How We Benefit Through Study

SINCE our volume of profit depends so largely upon the methods of management we use, and how we use them; the practical value of earnestly and thoughtfully studying such methods is readily recognized. Especially so, when we consider that the chief aim is to get a firmer hold on *basic principles* so we can apply them more *profitably*.

Specific information is necessary, of course; but basic principles are more *fundamentally* necessary because they always determine the ultimate success of our undertaking. This is quite as true, mind you, in the radio store as in any other commercial venture.

Please bear in mind that we are not “talking generalities.” On the contrary, we are getting right down to the real *brass tacks* of the situation. It actually requires more managerial ability now than ever before to operate a radio store successfully. It requires more practical application of sound fundamentals.

And remember this: Since the only way to reach the point of practical application in fundamentals is through our own analytic thinking, a thoughtful and continued study of basic principles is indeed a necessity in this age of many-sided and increasingly strenuous business competition.

Let us take a moment to remind ourselves, in this connection, that the chief benefits of study do not come to us through the specific things we learn; though these are tremendously important.

The chief benefits of study come to us through our better grasp of basic principles, and through the mental training we obtain from the analytic thinking we do.

Less Brawn, More Brain

THE really big point in it all is that the mental phase of profit producing counts for more today than ever before; and that it is sure to count for yet more in the years ahead.

Such is the inevitable law of development in civilization and its business—relatively less *brawn*, relatively more *brain*. It applies alike to salesmanship and management—to Sales Promotion and Profit Promotion.

We need especially to remember that study—*real* study—means much more than just reading and listening and observing. Real study consists in the thinking we do for ourselves, individually, about what we read and hear and observe.

That is why the study of anything—a book, an article, a lecture, a sermon,

a comment, some other business—often proves helpful even though nothing about it can be applied immediately or specifically. Broadening of vision is much more helpful, and much more needed, than specific instructions or rules.

Study brings us its greatest benefits when, and *only* when, it stimulates and guides our individual thinking to help us recognize that which we can apply with advantage to our own affairs, and in our own way.

Study—*real* study—trains us for the great game of business which calls constantly for relatively less of *brawn* and more of *brain*.

Planning Comes First

SO IT IS well worth our while to consider these obvious facts studiously—*thoughtfully*:

1. Without *action*, planning amounts to nothing more than the building of air castles.
2. Without *planning*, action usually gets us into a mess.
3. *Control* cannot be applied without being preceded by both planning and action.

These three basic essentials are inseparable. They always must pull together harmoniously to produce the best result. Clearly, the benefit to be derived from planning for profit depends upon what our plan *is*, and how we follow it with *action* and *control*. Seeing our goal is not enough. We also must see how our goal is to be reached.

Just trying to make all the profit we can in a given time is in itself a goal, of course. But it lacks the *definiteness* that seems always necessary in arousing our keenest interest and guiding us most surely to our intended destination.

Complete planning always determines in advance just how we are to reach our goal. It even includes reasonable allowance for all of the probable accidents and at least some of the merely possible accidents. Complete planning helps us to know, and *know* that we know, *where* we are going and *how* we are to get there.

Then Action and Control

NO MATTER how we look upon the always necessary element of service to the community, all sound commercial activities must aim at the same target—the target of **PROFIT**. We never can get away from that.

Operating as if *sales* were the bull's eye of the business target is the surest way I know to stage a surprisingly surprising surprise party for the day on which we learn how *much* our sales *were*, and how *little* our profit *is*.

(Continued on Page 58)

If I Owned a Radio Store

By DR. RALPH L. POWER



John Boles Has Taken Part in Many Programs.

IF I OWNED a radio store, I think one of the hitherto unexplored avenues of activity would be in drumming up an interest in things movie. Of course lots of stars do talk a good deal and say nothing much over the air. But this is gradually being overcome as the publicity gentry prepare speeches for the film celebrities to gargle through the microphone. Then, too, their practical experience with the talkies is standing them in good stead whenever they make a radio appearance.

If my emporium, be it ever so large or so small, was located in the southwest area, I would first turn particular attention to KFWB, Warner Brothers' broadcast channels of activity. The 8 p. m., Pacific standard time, hour on Sundays, known as the First National hour, always brings a galaxy of stars and starlets. The list of performers is usually available a week or ten days in advance.

I would make arrangements with the station to send this to me via air mail or in a day-letter wire. Then I would go around to the neighborhood show-house and see if the picture to be plugged on the Sunday eve. broadcast was scheduled for showing in the old home town. Each First National hour is ordinarily built up around some particular current release and all of the cast around Hollywood's sun-kissed pavements are supposed to amble over to the radio studio for the affair.

So, if the broadcast has to do with a talkie film now showing in the neighborhood film palace, I would make some sort of a cooperative arrangement with the house manager. This would be in the form of a close tie-in calling attention to the current picture at the theater, and also the forthcoming radio program of the same cast—using, of course, plenty of space to call attention to my radio shop—the necessity for outlying districts to keep their battery sets in good shape, advising town dwellers to change tubes as often as they do their red flannels, and some sort of message to prospective set owners telling them about the value of acquiring a set.

But, even if the talkie theater did not carry the picture at the particular time, I would still use the idea—getting out a postcard telling of the KFWB program—letting fans know that I would be glad to supply them with applause cards—suggesting that they service their present sets—even, perhaps, subtly dropping a hint that a brand-new model of the latest vintage might help them get the program in superb shape.

It is a good thing to keep in touch with the Warner organization. Not so long ago they filmed "The Dawn Patrol." In some of the scenes, taken in the San Fernando valley and out around Triunfo, the portable transmitter was used to direct the picture and also to give instructions for parachute jumpers, to the sausage balloon observers, and

other activities around the specially designed set created to depict a typical German airdome. This was all done on short waves and KFWB announced from time to time that the public was invited to try and hear the entire affair. This created tremendous interest among short-wave set owners.

Here would be a fine chance to send a little memo. to all my customers suggesting the thrill of hearing the actual making of a picture by merely owning a short-wave receiver or getting an adapter. And, of course, my window display of the week would be set up with the same idea in mind.

OF COURSE KFWB is not the only place to shop around on the dial for the movie stuff. The Columbia chain, at 6 p. m., Pacific standard time, has the Publix-Paramount hour. This, lately, during the warm weather, has centered largely on the New York stage presentations, but usually a portion of the program comes direct from sound stages of the Paramount lot out in Hollywood.

It seems a bit more difficult to contact this feature, but still I would make
(Continued on Page 32)



Dolores Costello Takes Prominent Parts in the First National-Vitaphone Broadcasts



Bebe Daniels May Be Heard on the RKO Transcontinental



Lilian Roth Is Heard on the Publix-Paramount Hour Through the NBC Network.

ONE FREE SERVICE CALL

By C. B. BAILEY

LAST FALL, when radio business was noticeably experiencing a lull, the Radiola Shop of Salt Lake City, Utah, inaugurated and advertised that one free service call would be given on any make or type of radio. Results were excellent, and C. L. Mayfield, the manager, found his service man making more new radio sales than any salesman in his crew of ten.

Now the free service call idea is a permanent factor in the sales promotion plans of the Radiola Shop, being used periodically during dull seasons. The offer is usually run for thirty days at a time. It is advertised both by radio and newspaper and has increased the repair department business as well as the sales.

"The free service call offers give us an opportunity to contact people who own obsolete sets," said Mr. Mayfield. "We state that the one free service call will be made on any make or type of radio and calls come in on every conceivable make. The opportunities for future sales are many."

According to Mr. Mayfield the free service call gives the owner an estimate of what it will cost to fix up his old radio. If it can be fixed without materials the service man proceeds to make the necessary adjustments. "We go ahead and make the minor repairs to get the good will of the person. But if the set must be torn down and new parts put in we usually suggest that the set be brought back to the shop where the work can be done. An estimate of the cost for the repairs is then given. If the tubes need replacing the service man can usually make the replacements right at the time of his first call. He then charges only for the materials."

The object of the free service call is to indirectly increase sales, but that fact is never made apparent to the person receiving the service call. "We never talk new radios to them when repairing the machine. We want them to thoroughly appreciate the call and to feel that we are interested in helping them. Usually, however, they bring up the question of new radios themselves. If not, then we can usually bring the subject up in a roundabout way.

"The secret of getting their confidence and later their sales is to interest ourselves in *their* interests, not try to interest them in ours. During the time that the service call is being made we try to draw them out on their particular hobbies or interests and then the conversation just naturally drifts around to new radios."

Mr. Mayfield states that one-half an hour is usually spent on the average ser-

vice call. But if the person is found interested in new radios the call often extends to one or two hours and the service man returns to the shop with almost a 100 per cent chance for a future sale. According to Mr. Mayfield, occasional sales have been made at the time of the free service call, but usually the call precedes the sale by several days or weeks. "People are prone to boost our service department and our shop to their neighbors and friends when we have satisfactorily served them on one of our free calls. We find excellent results coming from this source."

A card system is kept on the free service calls made by this firm. If the person on whom the call is made is in the market for a new radio, the fact is written on the card and then the service call is soon followed by a telephone call and a letter. If not in the market, the firm still has an additional name for its mailing list and follow-up letters are written within a reasonable period to let the person know that he has not been forgotten. Letters, according to Mr. Mayfield, are written to the effect that the newest radios are in and on display. They further invite the customer to drop in and see the new models.

A record of all of the service calls for the year is kept for letters to be mailed out at the end of that time to all prospects who have not become purchasers within that period.

ACCORDING to Stan Dodson, service manager of the Radiola Shop, who makes the greatest number of free service calls, a large amount of time on these calls can be saved by the girl in the office. "We can save half of our time on service calls if the necessary information is obtained before the service call is made," stated Mr. Dodson. "For this purpose we use a duplicate service

order blank. On this the name and address of the person calling for the free service call is obtained. The make of set is recorded. Information as to whether it is an electric, battery or eliminator set obtained, number of tubes, symptoms of the trouble, is also secured over the telephone at the time of the request for service."

This information makes it possible for him to prepare himself with necessary equipment for servicing the particular type of radio. Likewise when the symptoms of the trouble are known he is able to pretty accurately tell what must be done and just what it will take to put the set into working order again. "When we know the model and symptoms to begin with we can very often save ourselves a second call."

An idea which Mr. Dodson has originated to record the service call on the set itself has been found effective when second calls must be made at a later date. He uses a small red sticker which he places on the back or beneath the set. This records the tests made on the first service call. For example, the notations of "tubes tested" are recorded. Batteries tested are also noted. If eliminator or speaker has been tested that space is checked. Spaces for tube installations, battery installations and eliminator parts installed are also allowed for record if made. Other information on the sticker includes speaker repairs, antenna installed, set tested on distance, set tested for resonance, date of service, and by whom serviced.

"When we look at the sticker on our second service call we know at once just what was done on the previous call and are able to gauge our second servicing accordingly. The sticker also gives the owner of the set a reference. Each sticker bears the name, address and phone number of the Radiola Shop."

A second sticker, original with Mr. Dodson, is pasted on the tubes as they are tested. This sticker is about one inch long and one-half an inch wide. The sticker records the date and test made. It is also used to show the amount of gain of the tube at the time it was tested.

Mr. Dodson further makes it a habit to carry business cards when making service calls. Cards are left when the call is completed and are further responsible for later calls and future sales made through the service calls, he believes.

How Some Dealers Service

FREE
RADIO SERVICE
DAY OR NIGHT
To further acquaint radio owners with our
Service Department
One Service Call
ABSOLUTELY FREE
On Any Make or Type of Radio
STAN DODSON, Service Manager
This Offer Expires March 1st
Call Hyland 1566
RADIOLA SHOP
26 East 9th South
We Carry a Complete Line of Radio Accessories

Are Profiting from Work

SPECIALIZED RADIO SERVICE

By PAULINE SLAUGHTER

THE only established specialized radio service man in Denver is G. F. Bateman, who started in that city in a small way seven years ago. According to Mr. Bateman, he started in this business with a stock in trade consisting of a pair of pliers and the desire and intent to give the radio dealers of Denver a service which they themselves could not render.

Mr. Bateman is now located in a good-sized workshop at 1854 Arapahoe and has a service station which handles the entire radio servicing of several large firms in Denver as well as servicing for many individual owners of radios.

He employs from four to twelve service men. One of these is the "customer fixer." He is competent in fixing anything that is wrong with a set and also in explaining that certain complaints are not due to faults in a receiver. Mr. Bateman thinks that it is a poor policy for a salesman to render repair service, because if the salesman is continually having brought to his attention the many griefs of the machine he is selling, it will be only a matter of time before he ceases to be a good salesman.

Mr. Bateman gives the dealer a 90-day free repair service on every installation he makes. About ten per cent of the radios have to be serviced over a period of 90 days, and 81 per cent of these calls come within the first 30 days after installation.

THEY SELL ONLY RADIO SERVICE

By HAROLD J. ASHE

ESTABLISHED less than a year ago at Glendale, Calif., in competition with a score of other older-established radio concerns, the Radio Service Company has firmly entrenched itself and proved beyond a doubt that the feature peculiar to this firm is a wanted factor in the commercial life of the city. Its volume for the third three-month period showed an increase of 300 per cent over the first three-month period. And this increase is entirely one of service sales. The business is built on exclusive service and service exclusively. The firm does not sell sets, either new or second-hand.

"I think," stated M. W. Wagy, the firm's alert manager, "that the fact we have met with such instantaneous success has been due largely to our not being pluggers of any one radio set. Our sole business existence centers around fixing sets. The public recognizes us as disinterested parties. When we are called in to fix a set, we are not trying at the same time to sell a set.

"Another factor in gaining quick recognition has been our offer to service sets free if they are brought to the store. We can do this free service profitably because of the profit on the materials.

"We have as our slogan, 'As Near as Your Phone,' and in this connection we will call at the radio owner's home and give him a free estimate of what the

servicing will cost him. However, where we call for and deliver sets we charge for it, as distinguished from our free servicing offer where they are brought in to us."

Both newspaper and direct-mail advertising is being used by the Radio Service Company. About 3000 postcards are mailed out each month to a list of 9000 names, so that the entire list is covered in three months. This circularizing is done daily at the rate of about 100 or so a day, so that the response to the postcards will be evenly distributed and not cause too much work to come in at one time.

A small card is carried in the newspaper every day, while a four-inch double-column display advertisement is carried about once a week to feature the free estimate service and the free service on sets that are brought in. In addition to the firm's slogan, the telephone number is emphasized.

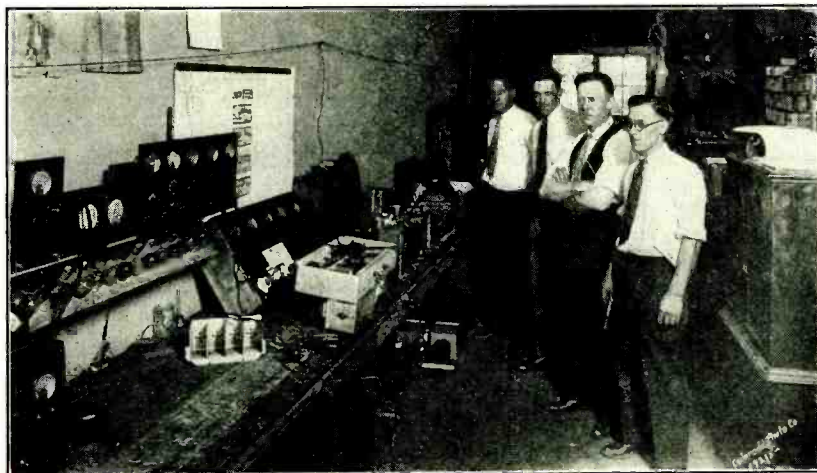
Glendale is an inland town not too far from the beaches. Right now the firm is giving free trips to Venice. These tickets are good for the car fare and also admission to various amusements. These, of course, go only to customers, and then only at the discretion of Mr. Wagy. In his opinion it is one of the best good-will builders he has ever used, as it provides a day's outing for the recipient, a present not easily forgotten. Buying these tickets at a big discount, he does not expect that the feature will cost him over \$60 or \$75 for the summer.

In addition to newspaper and direct-mail, Radio Service Company advertises over the Glendale radio station, and also maintains a portable broadcasting car. The car pays for itself and makes a profit, due to it being rented out about one day a week to various other non-competitive concerns at \$20 per day of eight hours.

The broadcasting car is a Chevrolet closed-body job, finely finished in blue and orange with the best equipment, such as dynamic speaker, Silver-Marshall amplifiers, Universal microphone and Bosch phonograph pickup. In renting the car to other concerns, the firm furnishes everything but the signs.

Service men are encouraged to be salesmen as well. In addition to being paid a straight salary they also receive 10 per cent on the sale of accessories. Where they call to give estimates they get 10 per cent of the estimate.

All service men are given small (one inch by two inch) cards to place in every set serviced. These cards act as a reminder to the set owner right at the time when he is, himself, examining the set for the trouble. The card suggestively says: "When your radio is not operating properly and needs servicing



Bateman's Shop

phone Douglas 3288 for complete, efficient radio service." This, together with the firm's name, address and slogan, completes the text.

The company uses a numbered work-order card which gives in detail the complete history of the job. The routing chart in the upper left-hand corner roughly divides the city into nine sections—north, east, south and west. An X mark in any of these squares shows the service man what part of the city the job is in. Thus, when he starts out in the morning with a dozen work orders he can consult them and make all calls in one section at a time. Mr. Wag-

says that otherwise a service man often spends more of his time traveling than on the job. Practically all of the card is arranged for X-marking, and when the service man properly fills in the squares there is little left to be known about the job.

Every time a service man does not find the customer at home he fills in a space reserved for such a statement, giving the time. There are three such spaces on each work order. If, on three occasions, the customer is not at home, the store telephones to him or drops a postcard stating why he has not seen a service man.

Other notations, provided for on the blank, and which are filled in at the office or at time order is taken, are:

Article has been delivered to us by customer.

Article will be called for by customer.

Article is to be picked up and repaired by us.

Article is to be delivered and installed by us.

Special instructions:

Promised about....A. M.P. M.

Service man asked for.

The bottom half of the card is ruled for a description and list of supplies, labor and other expenses.

If I Owned a Radio Store

(Continued from Page 29)

every effort to learn in advance exactly what the program calls for. Then I would follow much the same routine as suggested in the above paragraphs.

KHJ is now giving the "Voice of California" program at 7:30, PST, Wednesday nights, and it is shipped on the transcontinental eastward over the Columbia chain, too. This is a choice assortment of freshly hatched melodies from out of the land o' talkies. Previews of many talkie songs that will not be released publicly for another six weeks or two months in theaters get an airing on this weekly feature. Film directors, famous song composers, lyric creators, gag instigators and well-known talkie actors all get their chance at the sturdy KHJ microphone.

This would furnish another idea for my store. So, too, would be the 8:30 p. m. program on the same night over the same station to the coast chain—the M-G-M demi-tasse revue. This features, as the piece de resistance, George Olsen and his music, with the addition of two or three fairly prominent M-G-M artists.

KNX, as tied up with Paramount, also gives a few isolated talkie programs, in addition to carrying the Publix-Paramount hour. KFVD is located on the Hal Roach lot over in Culver City and every week some of the fun-makers from that studio carry the microphone for another goal. KMTR, at 8:30 of a Wednesday night, has what it calls "The Star Reporter," in which somebody or other interviews a well-known screen personality. Then there are two series, now discontinued, that may perhaps come back again—the 9 p. m. Saturday program to KFI and other coast stations (Del Monte sponsorship), presenting screen stars, and the Monday 4:30 p. m. broadcast via KHJ eastward on the "Voices from Filmland"

series. Even electrical transcriptions, if they are well made, might have value for my purpose if given regularly from any station.

I DON'T think for a moment that everybody is crazy about hearing talkie talent over the radio. But I am sure that there is a large enough percentage to make it profitable for me to publicize this angle of listening for those who buy receivers, not so much for the looks of the cabinet or the technicalities of the set, but for the entertainment it will bring them.

I would get out a nicely printed little leaflet giving the call letters, location, frequency and relative position on the dial of those stations most closely allied with the talkie industry.

Perhaps it would also include a diagram actually showing the relative places of these stations on the dial in relation to other broadcasters—and also it would include the time on the air of those features which are regularly scheduled.

Then, as a logical follow-up, I would get out a circular letter or postcard nearly every week and listing the talent for programs of the next few days that would include some type of film talent in them.

The customer and prospect file, built up by hard work in the shop, through telephone activity and plenty of leg work around town, would thus become more of a vital living thing.

And, on the other hand, the friendly attitude of the store would in time stamp itself in the minds of business friends the fact that I am not satisfied merely with selling sets, or with the ordinary service details, but that I am constantly in contact with broadcasters to keep my friends in touch with what's what on the air.

Sometimes offers are broadcast to send pictures of famous stars to the first hundred, or the first thousand writing in. This furnishes further incentive for radio fans to pick up the programs of stars from the squawkies.

I'm not so sure but what it would be a good thing to make some sort of arrangement with the film publicity offices by which I could buy some of the pictures en bloc—sembling from several studios—including in a nifty looking folder with my imprint, and offer to my customers and potential customers at some ridiculously low price made possible by getting them in large lots.

Grebe 7-Check Test

A. H. Grebe & Co. supplies dealers with cards of instruction whereby a customer can rate a radio set as to tone, control selectivity, sensitivity, decorative quality, construction, and value. Under each of these several headings there are a series of statements and simple questions whose rated answers will indicate the comparative worth of a receiver. Typical questions follow:

Do the kettledrums have a distinct pitch or do they sound like thuds? Does a man's voice give the impression that his head is in a barrel? Can you distinguish the letter "S" in speech? Does a violin radiate brilliance or does it seem muted?

Has a set a tone control that enables you to accentuate the bass without cutting out the treble and muffling speech? Does any other station intrude when you tune in a program you want? Do far-off broadcasts come in clearly when powerful local stations are on? Will the cabinet harmonize with your other furniture, and is it carefully made? Is the construction inside the set precise and compact? What is the price in relation to performance?

Determinants of *Radio Design*

By AUSTIN ARMER

TODAY'S radio receiver, the brain-child of an army of researchers, engineers and business executives, invites a host of questions and speculations as to "How did it evolve into its present form?" Certain fundamentals hold true in any industry which deals with the commercial manufacture of an essentially scientific instrument. Very evidently the radio receiving set industry falls into this classification, and it will be the purpose of this article to outline the factors which have led to present day design.

Because the radio industry is so new, and because it has offered a glamorous appeal to capitalists anxious to reap quick returns, a great deal of the progress in receiver manufacturing can be laid at the door of competition. Of course, competition between manufacturers of any article is a basis for improvement in quality and reduction in price. But there is a type of competition not at once evident to a casual observer of the industry, and this is the struggle, not between manufacturers of complete receiving sets, but between the suppliers of essential parts of these receivers.

A few years ago, a firm manufacturing radio receivers was an organization built around a research laboratory, whose main object was to put into commercial form the fruits of the laboratory's efforts. Now, the radio manufacturer has become primarily a sound business organization, still retaining the competent laboratory staff, but having the object of producing an article which will yield a profit. Consequently it de-

volves upon the management to secure the vital parts of the instrument from sources which can offer the greatest satisfaction at the least cost.

The parts usually purchased by the receiver manufacturer include loud speakers, power pack condensers, transformers, chokes, resistors and a great miscellany of small items such as sockets, potentiometers, escutcheons, knobs and other minor accessories. Realizing that almost without exception these parts originate outside of the receiver manufacturer's plant, it is at once evident that the suppliers of these parts are not only in a great measure responsible for the successful operation of the completed receiver, but in their struggle for commercial supremacy they have been the originators of a great number of important design features.

The electrodynamic speaker, at one time so costly to produce as to be impractical except in the most expensive receivers, has become universally adopted even by the manufacturers of the most inexpensive sets. The reason for this is that the manufacturers of these speakers have depended for their very existence upon finding ways for reducing production costs without sacrificing performance. Transformer manufacturers, dealing in an electrical unit known to the art for many years previous to the advent of a-c receivers have made tremendous strides, not only in the refinement of their product to avoid service difficulties, but have resorted to manufacturing methods which are a monument to the genius of production engineers.

Factors which have brought about the standard methods of building radio receivers

The power pack condenser, at one time the weakest member of the a-c receiver, has not only been perfected to the point where condenser breakdown is a thing of the past, but at the same time has been reduced in manufacturing cost. The condenser subject is one of particular interest because when the parts manufacturers had reduced the cost of paper condensers to a minimum, and increased the safety factor to a maximum, it still remained for the electrolytic condenser to replace the paper condenser, purely because of its reduced production cost and freedom from service difficulties.

Competition among the manufacturers of the small miscellaneous parts has been the keenest, largely because the unit of sale is small and quantities produced are very great indeed. For example, tube sockets, once eagerly sought by the home set builder, who willingly paid a dollar or so per socket, are now supplied to large users for a price ranging from five to six cents—and they are better sockets.

Standardization

ONE might well be justified in asking the question, "How can a receiver manufacturer build a product exactly in accordance with his own designs if he is forced to depend upon outside sources for the majority of his parts?" This question is not to be answered in one sentence. It is the question which has caused an endless amount of concern in the radio industry as a whole. Such organizations as the American Standards Association, the Radio Manufacturers'



Commercial Manufacture of an Essentially Scientific Instrument

Association and the Institute of Radio Engineers have put forth a most commendable effort in drawing up standard specifications for parts common to all radio receivers. Their efforts have standardized dimensions and material specifications on all of the minor parts, and have laid down uniform standards of inspection and acceptance of major parts.

In order to exemplify the part played by standardization in making possible the economical manufacture of a typical a-c receiver, let us examine a medium price chassis.

In all probability the power pack will have an '80 tube as a rectifier. It will have a pair of '45 tubes in push-pull as the output stage. It will have a radio frequency amplifier, detector and first audio stage consisting entirely of heater type tubes, either three or four elements. Very evidently the entire description of the receiver thus far has depended upon accepted standards of tube design. The '80 type rectifier, designed to give a large current output with a fairly limited voltage, made necessary the design of an audio power tube capable of high output at fairly low plate voltage. Thus the '45 tube was a happy compromise between the '71 type and the 210 type, having like the former a plate voltage requirement easily filled by the characteristics of the '80 type rectifier, and yet giving a power output in excess of the 210 type in order to satisfy the public's demand for a wealth of undistorted volume.

Let us look further into the part played by the tube manufacturer. The '80 tube, with its maximum rating of 325 volts, made possible the universal adoption of the electrolytic condenser as a principal part of the filter system. A broad statement—yet a very true one, for the electrolytic condenser, by virtue of its fundamental chemical and electrical characteristics, cannot be made commercially to withstand voltages greater than those on the order of 350 (the typical electrolytic condenser will break down temporarily when subjected to peak voltages exceeding 425 volts).

Thus we see how the tube manufacturer has been instrumental in affecting a vital receiver part widely different from his own product. Let us discuss further the part played by the tube manufacturer. The electrodynamic speaker must have a source of power to magnetize its field structure. The power requirement varies from 4 to 10 watts, and the '80 rectifier, with its available output of approximately 30 watts, is capable of supplying the necessary field power, and still have an ample surplus to take care of the power tubes, radio frequency tubes, detector and first audio.

But merely to supply the speaker field from the abundant power source offered by the '80 rectifier has not been a sufficient accomplishment for receiver designers. The field structure of the elec-

trodynamic speaker is highly inductive. Therefore in the majority of receiving sets this feature is utilized in such a way as to eliminate one or even all of the choke coils in the power pack filter, and put to work the inductive feature of the speaker field.

Thus far the design of the '80 tube has not only made practical the use of the electrolytic condenser and dynamic speaker, but by their use the entire power pack has been immensely reduced in cost and improved in its operation to the point of requiring no appreciable service in the field. Further, it has not only made possible the use of the highly desirable electrodynamic speaker, but by its use has actually effected an economy.

The Buying Public's Part

THE discussion so far has shown briefly the development of the important units in the typical units in the typical receiving set. By this statement it must not be construed that radio frequency design, detector design, and audio amplifier design are not of vital importance to the successful operation of any receiving set. It merely points out that certain fundamental parts which constitute a considerable factor in the building of a complete receiver have been defined by tube design.

Since any product comes into being as a result of the compromise between public demand and manufacturing ability, it is of interest to touch for a moment on the part played by the purchasing element as represented by the general public.

To the man whose nose is close to the grindstone there is some difficulty in appreciating that bit of Emersonian philosophy which tells us that the public will make a beaten path through the forest to the cabin of the man who has built a better mousetrap. Perhaps if the adage had also said, "at a lower price," this truism would perfectly describe the public's relation to receiving set design.

The man who buys a radio set is concerned only with a few fundamentals. First of all he wants a musical instrument capable of faithful reproductions of the broadcast programs. This faithfulness defines his pleasure in listening to his receiving set. Further, he wants those features in r-f design which give him freedom from interference due to poor selectivity, and a reasonable amount of distant reception. The latter feature is a function of the buyer's location. It is not so marked in urban localities, but becomes an essential consideration when the buyer is located at a distance from broadcast stations. Then there is the matter of eye value, for several years have passed since Mr. Public was content to give house room to an agglomeration of scientific gadgets, which attracted a great deal of curiosity and dust. Thus the furniture manufacturer plays a vital role in this little drama.

Assuming for the moment that the buyer's first concern is that his radio set shall bring the programs to him with life-size volume, the radio manufacturer must meet this requirement by supplying him with power tubes capable of putting forth great energy and a loud speaker capable of handling this energy without distortion. Thus we see that the buying public has played as important a part as the tube manufacturer in bringing forth the '45 tube and the electrodynamic speaker.

Part of the requirements of the man who is paying out his hard-earned money for a radio receiver is that the reproduction shall be free from extraneous noise, and who knows better than the radio salesman or service man that a-c hum has been until recently the bane of light-socket operated receivers? How has hum been overcome? Again refer to the efforts of the tube manufacturer. He has made feasible the electrolytic condenser, which is a brute force filter of the highest type. He has supplied ample plate current to take care of '45 tubes in push-pull. And push-pull operation means more than augmented audio power. It means an automatic elimination of that hum which results from ripple voltages existing in the grid or plate potentials supplying the power tubes.

Still another case where public demand has spurred the circuit designer and tube engineer to greater efforts lies in the field of distant reception. They have brought forth the tuned radio frequency circuit with cascaded amplification, the superheterodyne, and more recently the four element or screen grid tube in order that all of the circuit advantages could be utilized by the associated tubes.

In summing up the part played by the public, we may well credit this factor with the responsibility for having brought into being present day performance, for thus have the engineers been obliged to create lifelike realism of tone, freedom from undesired noises, sensitivity and selectivity.

The Large vs. the Small Radio Manufacturer

THE man who buys a receiving set is concerned not only with the performance of the set he buys, but with the background made up by the manufacturer's stability and his ability to provide service. The automobile industry has taught the buying public the misfortunes attendant to owning an orphan car. The orphan radio set has been no less a problem. Knowing this, the prospective buyer will rarely purchase a receiver without investigating the business stability of its manufacturer and sales representative.

There is one lesson which the buyer may not have learned. That has to do

(Continued on Page 58)



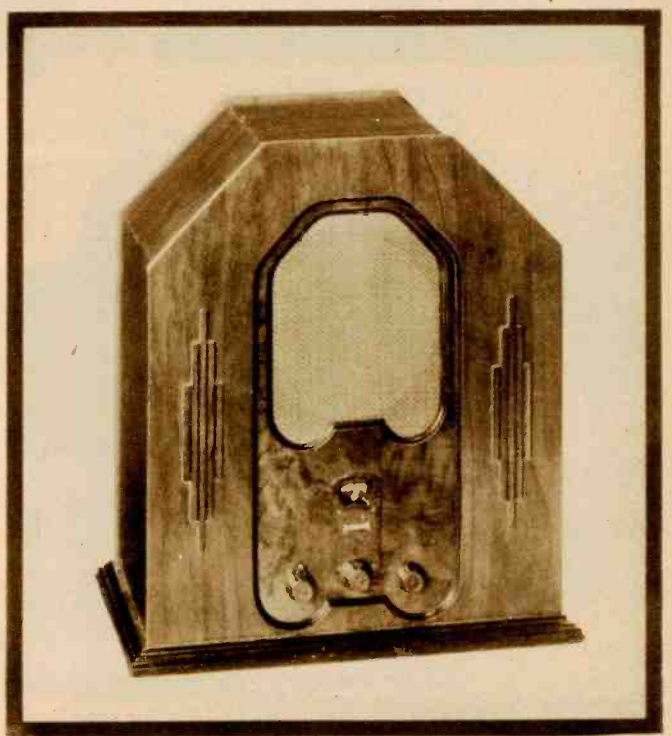
THE REMLER CAMEO

The Small Set of DISTINCTION

Recent Remler Cameo innovations include tone control and a screen grid circuit. These improvements added to the set introduced by Remler a few months ago augment the popularity of this attractive and deservedly popular receiver.

The extra value which Remler radio engineers have built into the Remler Cameo is reflected in its true-to-life performance. Every part has been designed and manufactured with a precision which means months and years of musical enjoyment to those who are today demanding dollar for dollar value in radio.

GRAY & DANIELSON MFG. CO.
2101 Bryant Street ▶▶▶▶▶
San Francisco, California ▶▶▶▶▶



FEATURES OF THE REMLER CAMEO

Screen grid circuit, employing three screen grid tubes, one '27 one '45 power, and one '80 rectifier tube. **Tone control.** Magnavox dynamic speaker—cabinet in walnut finish with burl matched walnut front. Price, complete with tubes . . . \$64.50.



APPLICATION FOR DEALER FRANCHISE

Gray & Danielson Mfg. Co.,
2101 Bryant St., San Francisco, Calif.

Send details on the REMLER franchise to me immediately.

Name.....

Address.....

RADIO PERSONALITIES



A. ATWATER KENT, President of the company which bears his name.



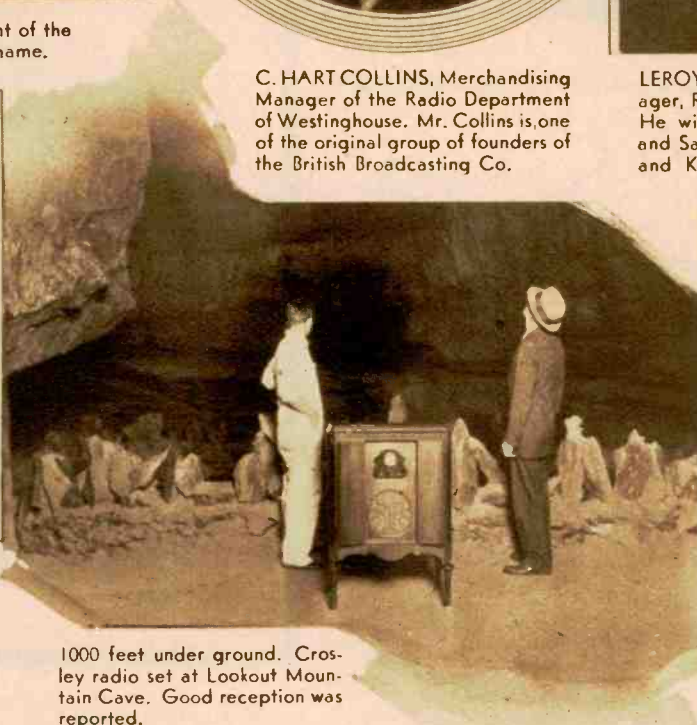
C. HART COLLINS, Merchandising Manager of the Radio Department of Westinghouse. Mr. Collins is one of the original group of founders of the British Broadcasting Co.



LEROY STAUNTON, Assistant to Manager, Radio Department of Westinghouse. He will be remembered as Advertising and Sales Promotion Manager of Brandes and Kolster from late 1922 until 1927.



Powell Crosley, Jr. (right) and Capt. William S. Brock. Mr. Crosley has just purchased the plane which Capt. Brock used last June when he established a new round-trip transcontinental record from Jacksonville, Florida to San Diego, California, and return.



1000 feet under ground. Crosley radio set at Lookout Mountain Cave. Good reception was reported.



OSCAR GETZ, President of Steinite. Plans are nearing completion for an entirely new Steinite program.

The COLONIAL Organization



DR. FULTON CUTTING, Chairman of the Colonial Board.



W. S. SYMINGTON, President of Colonial Radio Corp.



JOSEPH GERL, General Sales Manager of Colonial.



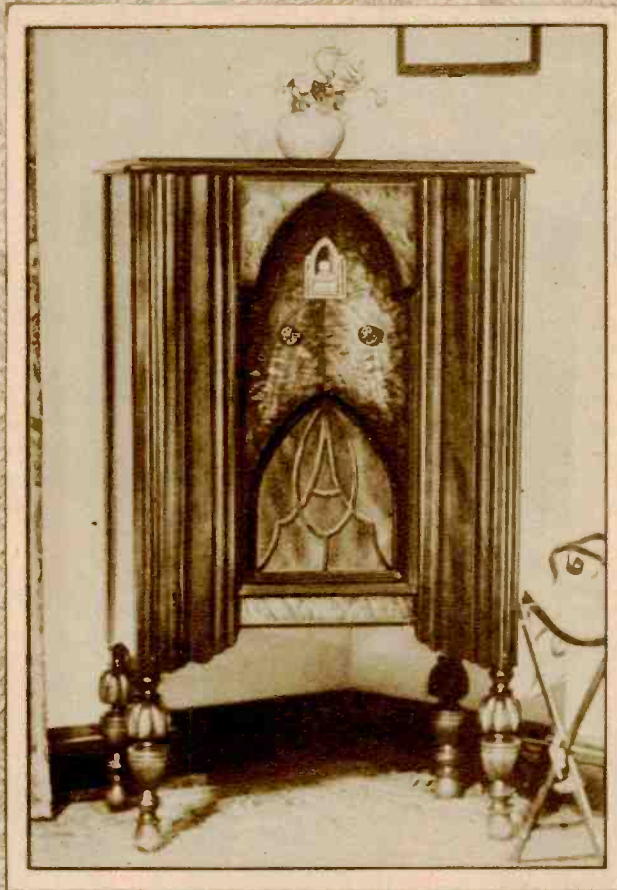
S. K. DICKSTEIN, Colonial's Advertising Manager.



FRED G. CARSON, Vice-President of Colonial Radio Corp.

AUDIOLA

Can You Afford To Gamble On Your Radio Profits?



MODEL No. 70 - \$107.00

MODEL

NO. 60

\$97

MR. RADIO DEALER

See your local distributor today—or write direct to us for Audiola's liberal discount plan. It will pay you to handle the Audiola radio!

LOW priced radios have reached the point where they represent a respectable portion of the total radio volume done in this country. This year—more than ever—a GOOD low priced receiver will be the bread and butter of the average dealer!

INCREASING your 1930-31 radio profits will largely be a matter of offering the right priced radios when they are most wanted.

AUDIOLA RADIO CO.

430 S. GREEN STREET

CHICAGO, ILLINOIS

RADIO MANUFACTURERS FOR EIGHT YEARS

CLARION CAPTURES ORIENT TRADE



Mr. and Mrs. C. M. Lee, Christian-Chinese couple of Singapore, S. S., and Hong Kong, China, as partners in one of the Orient's largest Importing and Exporting firms, spend a week in Chicago studying production, sales and advertising methods used by the Transformer Corporation of America, manufacturers of Clarion radios, which they distribute throughout the Straits Settlements and China after redressing the Clarion chassis in expensive Teakwood cabinets to meet the approval of high-class Chinese trade. Left to right: Mr. W. E. Hall, Advertising Manager; E. J. Dykstra, Sales Manager; Mrs. C. M. Lee, Mr. Lee, and Arthur Maybrun, Export Manager, discussing construction points of Clarion chassis.

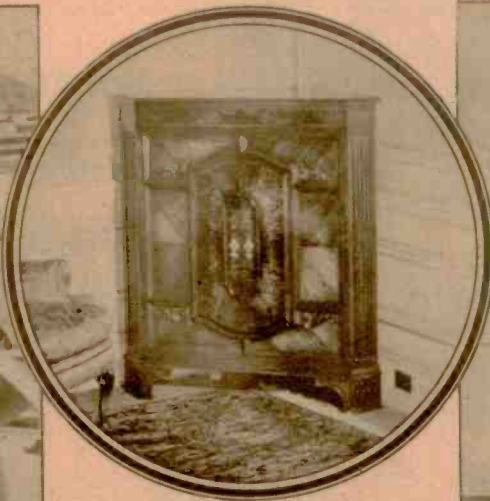


Summer excursionists on Lake Michigan steamers are made agreeably familiar with the new Clarion radio, manufactured by the Transformer Corporation of America, located in Chicago, when one of the Clarion's fleet of 32-foot yawls with auxiliary motors comes alongside to serenade with local and long-distance programs greatly amplified.

PHILCO EXECUTIVES GREET SYMPHONY LEADERS



J. M. Skinner, Vice-President and General Sales Manager of PHILCO, greets Leopold Stokowski, conductor of the Philadelphia Orchestra.



PHILCO'S De Luxe combination, the Concert Grand with 9-tube screen-grid plus chassis. \$350.00, less tubes.



Left to right: Sayre M. Ramsdell, Sales Promotion Manager of PHILCO, and Howard Barlow, Director of the Great Philco Symphony Orchestra.

Left to right: E. B. Loveman, Advertising Manager of PHILCO; Sayre M. Ramsdell, Sales Promotion Manager; E. Peyton, Secretary of PHILCO.

LITTLE SETS Now Made by Big Manufacturers



THE CLARION JUNIOR

Transformer Corporation's newest creation. Sold complete with matched CLARION TUBES for \$47.50.

Has tone control; full electro-dynamic speaker, push

pull 2-45's; triple screen grid radio frequency amplifier; screen grid power detector; phonograph jack; local-distance switch and illuminated dial.

THE MAJESTIC De-Luxe Compact

Not, strictly speaking, a "midget set," but it serves this purpose. Known as Model 52. The price is \$112.50, complete with tubes. Super-Heterodyne circuit . . . with a stage of radio frequency, an oscil-

lator, a first detector or "mixer," an intermediate stage, second detector and push-pull audio. Eight tubes, including rectifier. Electro-dynamic speaker. Volume and voltage controls.



THE ALL-AMERICAN LYRIC

A new LYRIC Table Model of the "midget" design. A six-tube receiver, including three screen grids, one '80 and two '45's. Three gang condenser. List price, \$74.00, less tubes.



-and the PHILCO BABY GRAND

A complete, compact radio set in Gothic design. Has PHILCO electro-dynamic speaker, seven tube screen grid chassis with double-tuned input circuit. Sold with seven PHILCO tubes. Priced at \$49.50, less tubes.

NATHANIEL BALDWIN ADDS NEW HIGHBOY MODEL

A new highboy has been added to the Nathaniel Baldwin line which may be had in either of two styles—with or without Remote Control. These new highboys are 48½" high and are in walnut consoles of the open face type. The highboys carry a seven-tube chassis, using triple screen grid circuits, push-pull amplification and an oversize electro-dynamic speaker. Model 90, which is the standard model and which uses 3-224; 2-227 and 2-245 tubes, without tubes, lists at \$145.00. Model 91 is similar except that it is a Remote Control model, in other respects identical to Model 90, and this lists at \$175.00, less tubes.



SILVER MARSHALL RADIO PLAYS FOR 8760 HOURS... AND STILL GOING!

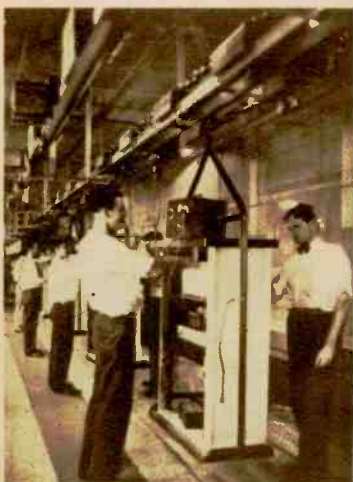


Aviation hasn't been setting the only endurance records in Chicago this summer—for on July 10th at 5 P.M. a Silver-Marshall Model 30A chassis had played continuously, twenty-four hours a day, for one year—8760 hours! And it's still going; not a single part being replaced in the whole year with the exception of two tubes.

The set was originally started not for a record but to prove a power-pack argument between M. C. Lanmon, the testing chief, and McMurdo Silver, President.

The receiver is on exhibition at Silver-Marshall's main office, 6401 West 65th Street, Chicago.

BOSCH MOTORBOAT RADIO



Testing Bosch radio receivers on special conveyor assembly and test line in Plant "B" at Springfield, Mass.



The new Bosch Radio Console 58 "A." List price, complete with chassis and ten-inch electro-dynamic speaker, less tubes, \$144.50. (Slightly higher in the Far West and Canada.)



The Bosch Radio Model 84 for all cabin boats, is contained in a solid mahogany cabinet distinctly nautical in its design. It is a single station selector receiver, with volume control, illuminated dial and on and off power switch. Price, less tubes and batteries, \$80.00.

The chassis in both The new Bosch radio models 80 and 84 for all boats is extremely compact. It is a 5-tube receiver, four of which are the latest screen-grid type.



The tuning control unit of the Bosch Radio Model 80. The unit has illuminated dial, single station selector, lock switch and volume control. Price, complete with receiver, speaker, "B" batteries and container, tubes, and wiring materials, \$140.00.

INTRODUCED TWO MONTHS AGO THOUSANDS ALREADY SOLD

TONE TEST DEMONSTRATION RECORD



For the
DEALER

Let your prospective customers judge the merits of a receiver by means of the TONE TEST DEMONSTRATION RECORD . . . a six-minute recording of the hard-to-reproduce musical notes. This record is a sales builder—a profit maker. An automatic salesman. An altogether unique and different form of demonstration. Why jump from station to station when this record tells the listener all he wants to know—lets him hear for himself how faithfully the receiver responds to the lowest and highest notes?



For the
JOBBER

Convince your dealer prospects that YOUR receiver gives faithful reproduction by means of the Tone Test Demonstration Record. You can do as other jobbers are doing—PROVE the performance of the receiver by using this record. Make comparative tests. Carry these records in stock for your dealers.



For the
**SALES-
MAN**

Take the Tone Test Demonstration Record with you when you call on a prospect. Let him listen to this automatic demonstration in his own home. The voice of the speaker, which is recorded on the record, tells the listener what each demonstration means. The flute, piccolo, drums, orchestra bells, male and female singing voices, organ selections and other musical tests are on this record. It is entertaining as well as USEFUL.



For the **SERVICE MAN**

When the very low notes which are recorded on this record are played, loose parts in a cabinet will start into vibration. And the high shrill notes show up loose parts in the metal chassis. A six-minute playing of this record will enable you to put a receiver into proper shape before it goes on the sales floor. Service men tell us that this record is a real time saver and a simple means for detecting faults.

\$1.00 EACH
POSTPAID

or a Standard Package of
SIX RECORDS for \$5.00

"RADIO" R9

428 Pacific Building,
San Francisco, California.

Here is \$ _____ in full payment for _____ Tone Test Demonstration Records. Shipment is to be made at once—POSTPAID. (Prices: \$1.00 each, or six for \$5.00)

Name _____
Street and No. _____
City _____
State _____



Duane Wanamaker, Vice-President Grigsby-Grunow Co. and Majestic Household Utilities Corp. (at left) and a friend from the East spend their vacation at Atlantic City.



MAJESTIC AUTOMATIC ELECTRIC REFRIGERATOR with Anita Page, M. G. M. star, presiding as hostess.

Left: MAJESTIC Window Display at Loop Store in Chicago draws big crowd. The Majestic radio set used by Hunter Bros. on world's endurance flight is to be exhibited in as many windows as possible. It is shown here in an elaborate setting.

Right: "MIZPAH," Commander McDonald's palatial yacht



ZENITH Model 72



ZENITH employees aboard the "MIZPAH" as guests of Commander McDonald.

Left: Commander E. F. McDonald, Jr., President of ZENITH



ZENITH Model 71

Getting Those Overdue Accounts Paid Up

By FRED E. KUNKEL

Is it possible to reduce the loss from bad accounts to an absolute minimum? When this question was put up squarely to a successful radio dealer recently, the answer was, "Yes, if you use the right amount of persistence, continuity and insistence, tempered with mild-scented tact. This reduced to a more commonplace formula means:

"First—The collection methods must bring home the bacon, without resorting to legal action and unnecessary expense, and without leaving a bad taste in the customer's mouth as a result of your extractions.

"Second — The campaign must be waged consistently and persistently from the 'drop of the hat' and yet so adroitly handled that the debtor will not be offended but will become a good-pay account afterward.

"Third — The moment the account becomes overdue it must be set aside for special attention and then followed up regularly at five and ten-day intervals.

"This prescription generally cures. It must, however, be compounded in true pharmaceutical style, certain very important ingredients accompanying the mixture.

"The trouble with most men is that they have vinegar in their veins. They can't distinguish between 'slow-pays' and 'dead-beats,' so they apply the same remedy as a cure-all. My method sifts the 'dead-beats' from the 'slow-pays' by a gradual weeding out process.

Never Let an Account Grow Whiskers

NEVER let an account grow whiskers on it. While slow-pays must be brought to time and dead-beats quickly spotted and severely dealt with, it is not a good plan to relegate every overdue account to the dead-beat class, or to send each and all of the delinquent accounts a hum-dinger of a collection letter. Those who have sufficient honesty will pay their bills eventually. All you have to do is to keep continually after them in a friendly vein until they are paid up in full.

"Slow-pays have potential sales possibilities for the future. There is no use scratching them from the ledger simply because they don't pay promptly. There may be some reasonable excuse. So I find out first if there is. It costs something to get good customers on the books, so I keep them there until I am

satisfied they are no longer entitled to credit.

"If I can get them to explain their delinquency I've got a stranglehold on their business and I maintain their friendship. I get the money eventually, if not sooner, than I would otherwise. And by keeping constantly after overdue accounts and handling them so adroitly that they cannot take offense, they will not only pay up but become good customers afterwards. It is human nature to pay your more insistent but more tactful creditors first."

The plan which this radio dealer uses in discovering the slow-pay and dead-beat accounts is as simple as it is effective. Just as soon as an account becomes delinquent the monthly statement is made out on yellow duplicates and the extra copies placed in a follow-up jacket for consecutive attention. Every ten days after the original statement is mailed, out goes one of the duplicate statements with a sticker attached, until four have been mailed. Then follow three letters. The net result of this campaign is a general clean-up with but few accounts left over for suit or the profit and loss account.

Stickers and Letters Get Results

GUMMED stickers are used, printed in red, on a white background, with a heavy blue border. All letters are typewritten because it was found that slow-pays were accustomed to printed form letters and seldom paid any attention to them.

Any one of this chain of go-getters can be counted on to bring in results. As the chain progresses the follow-up jackets becomes gradually unburdened of unpaid accounts. It is very seldom that the last letter of the series has to be mailed. But when it comes down to that it shows the dead-beat up, while the slow-pay has come across either with a check or a perfectly satisfactory explanation.

First Sticker

PLEASE TAKE NOTICE

That this account is now being carried on our books as *not paid on due date*. Can't you send a check by return mail, or at least explain when we may expect payment?

Second Sticker

WE HAVE BEEN WAITING

Most patiently—to receive your check, *now overdue*. Won't you please mail it to us *immediately* or explain why you are not making your usual prompt settlement and thus maintaining your reputation for *prompt pay*?

Third Sticker

YOU HAVE FAILED

To pay your account promptly, and we're growing more and more impatient *over your unexplained delay*. Why haven't we heard from you? Please don't keep us waiting any longer, but *send your check in today in the enclosed envelope*.

Fourth Sticker

SAY!

If you don't pay this account soon, whiskers will start growing on it! You've got a check handy right now, so here's the magic pin—*Get Busy, Please!* (A pin is stuck into the bill through the sticker.)

The balance of the accounts which fail to respond to stickers are now appealed to in the form of personally type-written letters, mailed at ten-day intervals:

First Letter

"We don't know whether you have been sick, absent on an extended vacation trip, or whether you have just plumb forgotten all about that little bill of ours for \$....."

"Now, if you will just write us your check for all the bills we have been sending you, we will call it square at \$..... (naming the amount actually due), without interest.

"That's fair enough, isn't it? And that will not only put you completely at ease, but it will also put us out of our misery! What do you say?"

Second Letter

"Say! It's some job to write two good sales-collection letters in a row! It is a trying thing to have to sit down to write you a letter which will not only bring home the bacon, but also keep you in friendly good humor.

"But, imagine my chagrin at not receiving your check promptly after I sent you the last letter! I thought surely it would bring you back—back into the fold for more business, *plus a check*. But you failed me completely.

"Now, please don't disappoint me again! You can save us both untold embarrassment by *sending in that check today*. End my suspense now—don't wait again until tomorrow, and then watch me smile all over, for my faith in you will be well founded. It's your move!"

Third Letter

"Well, it's happened! You've done it now!

"You have failed to answer my friendly summons and now it is going to be necessary for me to resort to a legal summons. You have not called me up, written me about your account, or come in to ask for an extension.

"But I have a certain way of judging people, and my judgment of you is that you're *Square*—with a big capital "S," and I'm just going to hang on to that opinion until Friday the Thirteenth. If you don't send in your check by that time—well, you know the rest. It's up to you now!"

Needless to say, this ends it. For if the customer does not come in to explain his delinquency or to make a partial payment, it is time to sue or charge off the account to profit and loss. Thus the scheme automatically separates the dead-beats from the slow-pays.



Radiotorial Comment

By the Editor

MANY an otherwise modern home has an ancient radio. It still works, after a fashion, and is allowed to remain. Realizing that it should be replaced by a modern set, the several associations that

The Modern Home Demands A Modern Radio

are sponsoring National Radio Week toward the end of September have adopted the slogan which entitles this comment.

It is a good slogan and should be effective in boosting sales if every radio dealer will tie in energetically with it. Undoubtedly many good arguments will be provided in order to stimulate sales, somewhat along the line of those which are presented below.

The two outstanding advantages of the modern radio are its convenience and its better tone quality. It requires no attention other than the throwing of a switch to supply power, the turning of a dial to tune in a station, and the adjustment of volume, and even these simple operations can be performed automatically if desired. There are no multiplicity of controls, no unsightly wires, and no troublesome batteries.

The modern radio gives a natural reproduction of voice and music instead of the distorted reproduction that characterizes the ancient radio. While some prospects can be convinced of this fact by a store demonstration, the majority need a side-by-side demonstration in order that the tonal defects of their dear old familiar squawker can be realized.

The modern radio employs power tubes and an electro-dynamic speaker. It reproduces either radio or phonograph music and in some cases records voice or music for future reproduction. It is operated directly from the a-c power which is supplied to the modern home. It may have automatic remote control of tuning, of volume or of tone. It is equally sensitive and selective throughout the broadcast range and is faithful in the reproduction of all tone values. Finally it is obtainable in a cabinet which will harmonize with the furnishings of the modern home.

The conclusive argument, however, not only for the replacement of ancient radios, but also for the introduction of radio where it is not now used, is the program that may be heard. Radio has made it unneces-

sary for a family to seek for entertainment away from home. It has brought back the family life whose absence is so often deplored. It has replaced the proverbial fireside as the center of modern home life. It is outlawing the cynical definition of a home as a place where you change your clothes to go some other place. So the modern home does demand a modern radio.

EVERY large radio manufacturer employs a sales promotion department whose duty is to supply literature and display material which will assist the dealer in selling the product. Every distributor em-

Dealer Helps

employs salesmen, part of whose duty is to induce the dealer to use these helps. Yet every dealer's shelves are cluttered with such helps, unused. Millions of dollars are spent for dealer helps, and perhaps not ten per cent of them are effectively used. A visit to almost any radio store in almost any town will verify the truth of this statement.

Why is the dealer so apathetic about using this material? Granting that he might be lazy, and admitting that most of this "help" is forced upon him when he has not sent out an SOS for it, there must be some good reason why even the most unprogressive dealer does not avail himself of what is intended to help him in his business. Nor, all too often, is the reason hard to find.

The average material of this sort, while it gets in one lick for the dealer, gets in nine licks for the manufacturer. It is primarily a help for the manufacturer, and only secondarily a help for the dealer. Its main function is to sell the manufacturer's product. It places little or no emphasis upon the store and its service. Nothing is done to add to the dealer's prestige. He is apparently nothing but a retail outlet for the manufacturer.

Of course it may be argued that the dealer ought to look out for himself in these respects. But that is where the average dealer really needs help. For instance, he may need a booklet to be slipped into every set that he sells, advising the customer how to take care of minor service troubles and where to go for correction of major ones. This booklet should be imprinted with his name and not that of the manufac-

turer. He may need advice on how to attract customers to his store, how to handle collections, or how to keep his books.

Yet how few manufacturers have sensed these real needs! How few of them are helping the dealer to do anything except to sell their own products! How few of them have studied the needs of individual dealers, or even of various classes of dealers, when they dump mass production of so-called dealers' helps into stores where they are more often a hindrance than a help!

THE latest idea to be employed in the campaign against interference to radio reception is to establish a rogues' gallery of the offenders. This gallery consists of pictures of the characteristic form of interference that is produced by each kind of electrical equipment. These pictures are taken with an oscillograph and are used as a basis for comparison with any disturbance that is seen in an oscillograph while the interference is happening. As each kind of interference causes a different form of wave it is thus possible to recognize what kind of a device is responsible. Thereafter the interfering device can be located and the necessary filter or shield applied.

Pictures of Interference

This method was developed by two engineers at the Iowa State College and is described in the July "Proceedings" of the Institute of Radio Engineers. While an experienced investigator can often determine the source by its characteristic sound, he is unable to describe it well enough so that an inexperienced man can do likewise. So this method of "finger-printing" the rogues makes it easier to find them.

The same authors find that satisfactory reception is not possible when the noise is produced from a source whose field strength at the receiver is greater than 1 microvolt per meter, which is the intensity required to produce a standard output from a very sensitive receiver, and which is also the average level of summer static. By increasing the power of a broadcast station its field strength is correspondingly increased at any location. For this reason it is possible to receive a powerful nearby station without noticeable interference when the noise would drown out a distant weak station.

ALTHOUGH common usage is making a guaranty synonymous with a warranty, radio business men should be on guard against the indiscriminate use of these terms. A guaranty is a promise to answer and be responsible for somebody's debt or default. A warranty is a seller's assurance that certain facts regarding a purchased article are exactly as declared or promised to be. Thus a guaranty has to do with the payment of money for an article or service, while a warranty is concerned with the fitness of the article or

A Guaranty Not a Warranty

service. Some smart lawyer may use this distinction in meaning as a means for evading the provisions of a manufacturer's "guarantee." The confusion in the use of these two words throughout the radio trade is amazing.

AN IMPORTANT consideration in the general question of whether a dealer should confine himself to one make of radio or handle several, is the amount of protection which the manufacturer or jobber gives to the dealer. If he is to handle one set exclusively, is he to be the only dealer in his territory? Is he

Exclusive Representation

to be protected against any sudden price cuts or changes in models? Is he to be helped by factory advertising which covers his territory? Will the manufacturers coöperate in the disposal of trade-ins? Is the dealer given adequate help in servicing? Can he be assured reasonably permanent representation if his sales are reasonably large? If the answers to all these questions are in the affirmative, a dealer may be justified in confining his sales efforts to one line.

WHILE no tube manufacturer has yet offered to present people with free radio sets so as to stimulate the demand for tubes, this form of self-interested public service is not an utter impossibility, especially with the development of the cheap midget set. The big profits in the radio business come from the sale of tubes, just as in the razor business they come from the sale of blades and soap, or in the camera business from the sale of films. What with shoe manufacturers encouraging the construction of footpaths and automobile manufacturers boosting for better roads, both of which take people away from home, the radio dealers' only present argument to keep them at home is that the public is getting a 50 million dollar broadcast show this year for the price of a receiving set.

Free Radio Sets?

THERE are tricks to all trades," even in radio. One of these is to connect two receivers to the same aerial and ground during a demonstration, the demonstrator's favorite having a tuned input and the other an untuned antenna system. While the unfavored set is being demonstrated the other inoperative favored one may be tuned to the same station so as to absorb some of the station energy, thereby causing a poor sensitivity and selectivity showing in the unfavored set. Then when the favored set with the tuned input is demonstrated it will make a better showing because it is not robbed of part of its energy. The fair demonstrator uses a double-pole, double-throw switch so as to give each receiver the benefit of a single aerial.

Fair Demonstrations

Prices and Specifications of Radio Receivers

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
ACME						
88	3-24	'27	1-27, 2-45	'80	Yes	135.00 135.00
88	3-24	'27	1-27, 2-45	'80	Yes	155.00 155.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
ALL-AMERICAN LYRIC						
11-D	2-24	'24	1-27, 2-45	'80	No	99.50 99.50
11-H	3-24	'24	1-27, 2-45	'80	Yes	114.50 114.50
19-D	2-24	'24	1-27, 2-45	'80	No	119.00 119.00
19-H	3-24	'24	1-27, 2-45	'80	Yes	134.00 134.00
29-D	2-24	'24	1-27, 2-45	'80	No	139.00 139.00
29-H	3-24	'24	1-27, 2-45	'80	Yes	154.00 154.00
*39-D	2-24	'24	1-27, 2-45	'80	No	199.50 199.50
*39-H	3-24	'24	1-27, 2-45	'80	Yes	214.50 214.50
69-H	3-24	'24	1-27, 2-45	'80	Yes	184.00 184.00
Bat.	2-32	'32	1-30, 2-31	..	No	99.50 99.50

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
AMRAD						
†Rondeau	3-24	'24	2-45	'80	Yes	150.00 150.00
†Sondo	3-24	'24	2-45	'80	..	240.00 240.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
ANDREA FADA						
41	3-24	2-27	1-27, 2-45	'80	Yes	218.00 218.00
42	3-24	2-27	1-27, 2-45	'80	Yes	159.00 159.00
44	3-24	2-27	1-27, 2-45	'80	Yes	188.00 188.00
46	3-24	2-27	1-27, 2-45	'80	Yes	228.00 228.00
*47	3-24	2-27	1-27, 2-45	'80	Yes	328.00 328.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
†APEX						
27 Midget	2-24	'27	2-45	'80	No	59.50 59.50
30 Automobile	2-24	'26	1-01A, 1-71A	..	No	79.50 79.50
28A (60 cycle)	3-24	'27	1-27, 2-45	'80	No	105.00 109.50
28AX (25 cyc.)	3-24	'27	1-27, 2-45	'80	No	109.00 113.50
31B (60 cycle)	3-24	'27	1-27, 2-45	'80	No	127.50 135.00
31BX (25 cyc.)	3-24	'27	1-27, 2-45	'80	No	131.50 139.00
31C (60 cycle)	3-24	'27	1-27, 2-45	'80	No	175.00 182.50
31CX (25 cyc.)	3-24	'27	1-27, 2-45	'80	No	179.00 186.50
31D (60 cycle)	3-24	'27	1-27, 2-45	'80	No	185.00 192.50
31DX (25 cyc.)	3-24	'27	1-27, 2-45	'86	No	189.00 196.50
30 (Automobile)	..	..	..	..	..	75.00 75.00
54 (Bat.)	2-24	'26	1-01A, 1-71A	..	No	95.00 99.50
55 (Bat.)	2-24	'26	1-01A, 1-71A	..	No	58.00 60.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
ATWATER KENT						
70	3-24	'27	1-27, 2-45	'80	..	117.00 125.00
74	3-24	'27	1-27, 2-45	'80	..	125.00 131.00
*75	3-24	'27	1-27, 2-45	'80	..	195.00 205.00
76	3-24	'27	1-27, 2-45	'80	..	145.00 152.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
AUDIOLA						
60	3-24	'27	2-45	'80	No	97.00 104.00
70	3-24	'27	2-45	'80	No	107.00 111.00
80	3-24	'27	2-45	'80	No	119.00 125.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
BOSCH						
58A (60 cycle)	3-24	'24	1-27, 2-45	'80	No	144.50 148.50
59A (25 cycle)	3-24	'24	1-27, 2-45	'80	No	144.50 148.50
58B (60 cycle)	3-24	'24	1-27, 2-45	'80	No	159.50 163.50
59B (25 cycle)	3-24	'24	1-27, 2-45	'80	No	159.50 163.50
160D (60 cyc.)	3-24	'24	1-27, 2-45	'80	Yes	195.00 199.50
161D (25 cyc.)	3-24	'24	1-27, 2-45	'80	Yes	195.00 199.50
163D (DC)	3-24	'24	1-27, 2-45	..	Yes	195.00 199.50
160E (60 cyc.)	3-24	'24	1-27, 2-45	'80	Yes	250.00 257.50
161E (25 cyc.)	3-24	'24	1-27, 2-45	'80	Yes	250.00 257.50
163E (DC)	3-24	'24	1-27, 2-45	..	Yes	250.00 257.50
†Automobile	3-24	'24	1-12A	..	No	140.00 140.00
Motorboat	3-24	'24	1-12A	..	No	80.00 80.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
BROWNING-DRAKE						
69	2-24, 2-27	'24	1-27, 2-45	'80	Yes	129.50 139.50
†70	3-24	'24	1-27, 2-45	'80	Yes	159.50 173.50
†71	3-24	'24	1-27, 2-45	'80	Yes	192.50 210.50
†70-R	3-24	'24	1-27, 2-45	'80	Yes	229.50 243.50
†71-R	3-24	'24	1-27, 2-45	'80	Yes	262.50 280.50

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
BRUNSWICK						
15	3-24	'24	2-45	'80	Yes	139.50 139.50
22	3-24	'24	2-45	'80	Yes	170.00 170.00
*31	3-24	'24	1-27, 2-45	'80	..	185.00 185.00
†42	3-24	'24	2-45	'80	Yes	.....

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
CARDON PHONOCRAFT CORP.						
*234	6-484	484	1-484, 2-183	'80	..	275.00 294.50
†103	6-484	484	1-484, 2-27, 2-183	'80	..	580.00 595.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
CLARION (Transformer Corp. of America)						
AC-51	3-24	'27	1-27, 2-45	'80	Yes	109.00 109.00
AC-53	3-24	'27	1-27, 2-45	'80	Yes	129.00 129.00
*AC-55	3-24	'27	1-27, 2-45	'80	..	200.00 200.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
COLONIAL						
Princess	2-24	'24	1-27, 2-45	'80	Yes	129.50 129.50
Mayflower	2-24	'24	1-27, 2-45	'80	Yes	139.50 139.50
Windsor	2-24	'24	1-27, 2-45	'80	Yes	149.50 149.50

Remote Control at \$34.00 extra.

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
COLUMBIA						
C-20	3-24	'24	1-27, 2-45	'80	Yes	145.00 145.00
C-21	3-24	'24	1-27, 2-45	'80	Yes	185.00 185.00
990	Automatic Phonograph only			..	..	295.00 295.00
†991	3-24	'24	1-27, 2-45	'80	..	350.00 350.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
CROSLLEY						
26H (Bat.)	2-22	'22	3-12A	..	No	45.00 45.00
26J (Bat.)	2-22	'22	2-112A	..	No	84.50 84.50
26K (Bat.)	2-22	'22	2-112A	..	No	88.50 88.50
†Buddy	2-24	'24	4-45	'80	No	64.50 64.50
Mate	2-24	'24	4-45	'80	No	75.00 75.00
Pal	2-24	'24	4-45	'80	No	69.50 69.50
Partner (Bat.)	2-22	'22	3-12A	..	Yes	88.50 88.50
*Arbiter	2-24	'24	2-45	'80	..	137.50 137.50
†Director	2-24	'24	2-45	'80	Yes	107.50 107.50
Roamio (Auto)	2-24	'27	2-12A	..	No	75.00 75.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
EDISON						
R-4	3-27	'27	1-27, 2-45	'80	Yes	215.00 223.00
B-5	3-27	'27	1-27, 2-45	'80	Yes	175.00 177.00
*C-4	3-27	'27	1-27, 2-45	'80	..	325.00 336.00
R-6	3-24	'27	2-27, 2-45	'80	Yes	297.00 306.00
R-7	3-24	'27	2-27, 2-45	'80	Yes	268.00 270.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
GENERAL ELECTRIC						
†Lowboy	3-24	1-27, 1-24	2-45	'80	Yes	142.50 142.50
†Highboy	3-24	1-27, 1-24	2-45	'80	Yes	179.50 179.50
*†Comb.	3-24	1-27, 1-24	2-45	'80	..	285.00 285.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
GENERAL MOTORS						
Heppelwhite	3-24	'27	1-27, 2-45	'80	Yes	136.00 136.00
Sheraton	3-24	'27	1-27, 2-45	'80	Yes	152.00 152.00
Italian	3-24	'27	1-27, 2-45	'80	Yes	175.00 175.00
*Queen Anne	3-24	'27	1-27, 2-45	'80	..	198.00 198.00
*Georgian	3-24	'27	1-27, 2-45	'80	..	270.00 270.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
GRAYBAR						
†700	3-24	1-27, 1-24	2-45	'80	Yes	142.50 142.50
†770	3-24	1-27, 1-24	2-45	'80	Yes	179.50 179.50
†*900	3-24	1-27, 1-24	2-45	'80	..	285.00 285.00

MAKE	TUBES			Phono Jack	PRICE	
	RF	Det.	AF		East	West
GREBE						
SK4 Chassis						
21950-A	3-24	'27	2-45	'80	Yes	219.50 223.50
265	3-24	'27	2-45	'80	Yes	260.00 272.00
285	3-24	'27	2-45	'80	Yes	285.00 292.00
*450	3-24	'27	2-45	'80	..	450.00 465.00
AH-1 Line						
160	3-24	'27	2-45	'80	No	160.00 165.00
189	3-24	'27	2-45	'80	No	189.00 194.00
225	3-24	'27	2-45	'80	No	225.00 230.00

Note—All models made for 110 v. DC also.

- * Phonograph Combination.
- † Prices quoted with tubes
- ‡ Extra tube used as automatic volume control.
- § Remote Control.
- ¶ Automatic Combination.
- || Superheterodyne—Extra '27 tube used as Oscillator; RF and IF tubes listed together.

Prices and Specifications of Radio Receivers

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
HOWARD							
Consolette	3-24	'27	2-45	'80	No	185.00	195.00
Puritan	3-24	'27	2-45	'80	No	210.00	220.00
Plymouth	3-24	'27	2-45	'80	..	165.00	175.00
†Patrician	3-24	'27	2-45	'80	..	215.00	225.00
Hepplewhite	3-24	'27	2-45	'80	..	245.00	255.00
Florentine	3-24	'27	2-45	'80	..	275.00	285.00
Gothic	3-24	'27	2-45	'80	..	275.00	285.00
*Combination	3-24	'27	2-45	'80	..	325.00	335.00

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
JACKSON							
NJ-30 (Chas.)	2-24	'27	1-24, 1-45	'80	Yes	77.50	77.50

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
KELLOGG							
523	3-K-24	K-27	1-K-27, 2-45	'80	Yes	175.00	190.00
*525	3-K-24	K-27	1-K-27, 2-50	'81	Yes	225.00	240.00
524	3-K-24	K-27	1-K-27, 2-50	'81	..	395.00	415.00

Note—25-cycle models \$10 more in each case.

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
KENNEDY							
220	3-24	'27	1-27, 2-45	'80	Yes	159.00	159.00
220-B	140.00	..
320	3-24	'27	1-27, 2-45	'80	Yes	189.00	189.00
426	159.00	..
526	169.00	..
626	189.00	..
726	226.00	..
§726A	285.00	..
§§726B	390.00	..
826	199.00	..
*826A	242.00	..
826B (Long & Short Wave)	252.00	..
*826C (Long & Short Wave)	304.00	..

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
LEUTZ							
Seven Seas	3-24	'27	1-27, 2-50	2-81	Yes	295.00	295.00
"	3-24	'27	1-27, 2-50	2-81	Yes	295.00	295.00
"	3-24	'27	1-27, 2-50	2-81	Yes	610.00	610.00
*Do (Comb.)	3-24	'27	1-27, 2-50	2-81	..	395.00	395.00
Silver Ghost	4-24	'27	2-27, 2-50	2-81	..	2400.00	2400.00

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
MAJESTIC							
†52 Compact	2-24	1-24, 1-27	2-45	'80	..	112.50	112.50
90	4-G27	G27	2-G45	G80	No	95.00	95.00
91	4-G27	G27	2-G45	G80	No	116.50	116.50
92	4-G27	G27	2-G45	G80	No	158.00	158.00
93	4-G27	G27	2-G45	G80	No	146.00	146.00
*102	4-G27	G27	2-G45	G80	..	183.50	183.50
*103	4-G27	G27	2-G45	G80	..	203.50	203.50
130	3-G24	G-24	2-G45	G80	..	117.50	117.50
131	3-G24	G-24	2-G45	G80	..	137.50	137.50
132	3-G24	G-24	2-G45	G80	..	167.50	167.50
233	3-G24	G-24	2-G45	G80	..	245.00	245.00

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
NORDEN-HAUCK							
Super DX5 (Short Wave)	1-Pen.	'27	1-27, 2-45	'80	No	150.00	150.00
†Admiralty	6-24	2-27	2-50	2-81	Yes	350.00	350.00
†Admiralty	6-24	2-27	2-50	2-81	Yes	450.00	450.00

RM-4 (Bat.)—4 English tubes used

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
PHILCO							
*296	3-24	2-27	1-27, 2-45	'80	..	198.00	212.60
96 Hiboy	3-24	2-27	1-27, 2-45	'80	No	145.00	152.60
96 Loboy	3-24	2-27	1-27, 2-45	'80	No	127.50	132.60
96 Table	3-24	2-27	1-27, 2-45	'80	No	85.00	90.10
*96 Concert	..	..	..	..	..	..	..
Grand	3-24	2-27	1-27, 2-45	'80	No	350.00	372.60
77 Loboy	2-24	'24	1-27, 2-45	'80	No	110.00	117.00
77 Console	2-24	'24	1-27, 2-45	'80	No	95.00	97.00
77 Table	2-24	'24	1-27, 2-45	'80	No	55.00	59.50
41 (DC) Hiboy	2-24	'24	1-27, 2-71A	..	No	149.50	155.40
41 (DC) Loboy	2-24	'24	1-27, 2-71A	..	No	119.50	125.40
41 (DC) Console	2-24	'24	1-27, 2-71A	..	No	99.50	105.40
41 (DC) Table	2-24	'24	1-27, 2-71A	..	No	..	67.90
30 (Bat) Hiboy	3-32	2-30	1-30, 2-31	..	No	129.50	136.10
30 (Bat) Loboy	3-32	2-30	1-30, 2-31	'80	No	99.50	106.10
20 Baby Grand	2-24	'24	1-27, 2-71A	..	No	49.50	51.00

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
RCA							
§80	3-24	1-27, 1-24	2-45	'80	Yes	142.50	147.50
§82	3-24	1-27, 1-24	2-45	'80	Yes	179.50	184.50
§86	3-24	1-27, 1-24	2-45	'80	..	285.00	285.00

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
SENTINEL							
8	3-24	'24	1-27, 2-45	'80	..	99.50	..
*9	3-24	'24	1-27, 2-45	'80	..	149.50	..
11	2-24	'24	1-27, 2-45	'80	..	130.00	..
*12	2-24	'24	1-27, 2-45	'80	..	180.00	..
15	2-24	'24	1-27, 2-45	'80	..	137.50	..
16	2-24	'24	1-27, 2-45	'80	..	150.00	..

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
SILVER							
†Queen Anne	..	..	..	..	..	..	..
Nine	3-24	'24	1-27, 2-45	'80	Yes	185.00	185.00
†Elizabethan	3-24	'24	1-27, 2-45	'80	Yes	225.00	225.00
Princess	2-24	'24	1-27, 2-45	'80	Yes	135.00	135.00
Queen Anne	..	..	..	..	..	..	..
Seven	2-24	'24	1-27, 2-45	'80	Yes	165.00	165.00

Remote Control optional.

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
SPARTON							
49 (Bat.)	6-686	'01A	1-01A, 1-71A	..	Yes	76.00	89.00
*†101	5-484	484	2-226, 2-586	2-81	..	..	495.00
110	5-484	484	2-226, 2-586	2-81	Yes	395.00	395.00
111	5-484	484	2-226, 2-586	2-81	Yes	395.00	395.00
301	5-484	484	2-250	2-81	Yes	..	255.00
589	6-484	484	2-182B	'80	Yes	169.50	174.85
591	5-484	484	1-484, 2-182B	'80	Yes	145.00	149.50
593	5-484	484	1-484, 2-182B	'80	Yes	145.00	149.50
600	6-484	484	2-183	'80	Yes	169.50	179.50
610	6-484	484	2-183	'80	Yes	169.50	179.50
620	6-484	484	2-183	'80	Yes	184.50	194.50
740	6-484	484	2-586	2-81	Yes	235.00	255.00
750	6-484	484	2-586	2-81	Yes	275.00	295.00
870	6-484	484	2-226, 2-586	2-81	Yes	380.00	395.00

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
STEWART-WARNER							
953	3-24	'27	1-27, 2-45	'80	Yes	99.75	104.50
R100-2	3-24	'27	1-27, 2-45	'80	No	..	142.25
-3	3-24	'27	1-27, 2-45	'80	No	..	167.50
-4	3-24	'27	1-27, 2-45	'80	No	183.50	203.00
*-5	3-24	'27	1-27, 2-45	'80	No	197.50	222.50

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
STERLING							
Troubadour	3-24	'27	1-27, 2-45	'80	Yes	129.50	139.50
Serenader	3-24	'27	1-27, 2-45	'80	Yes	149.50	165.00
Imperial	3-24	'27	1-27, 2-45	'80	Yes	187.50	201.00
C3-60	2-24	'24	1-45	'80	Yes	110.00	110.00
Little Symphony	2-24	'24	45	'80	No	69.00	..
Chorister	3-24	'24	1-27, 2-45	'80	Yes	107.50	..
Minstrel	3-24	'24	2-45	'80	Yes	123.50	..

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
STORY & CLARK							
36	3-24	'27	2-45	'80	Yes	208.00	..
†43	3-24	'27	2-45	'80	Yes	248.00	..
†61	3-24	'27	2-45	'80	Yes	317.00	..

MAKE	TUBES				Phono Jack	PRICE	
	RF	Det.	AF	Rect.		East	West
STROMBERG-CARLSON							
10	3-24	'24	2-45	'80	Yes	259.00	..
11	3-24	'24	2-45	'80	Yes	285.00	..
641	3-24	'27	45	'80	Yes	155.00	165.00
642	3-24	'27	45	'80	Yes	259.00	277.00
645 (DC)	3-24	'27	1-27, 2-45	..	..	272.50	..
652	3-24	'27	45	'80	Yes	239.00	257.00
654	3-24	'27	45	'80	Yes	369.00	387.00
†846	3-24	'27	†1-27, 2-45	2-80	Yes	347.50	377.50

If the *Customer* Says, "Charge It!"

The Problem of Authorization—Charge-Takes and Charge-Sends — Authorization Files—Limits Identification Methods

By JOHN T. BARTLETT

THOSE customers who, ordering goods on service, give a name and say, "Charge it!" must be checked on. Are they entitled to credit, or the amount of the credit involved in the purchase? Are they the persons they represent themselves to be? Out of this general situation grows the task of authorization. It is far more complex in the big store than in the small one; but for each it demands a special routine expertly arrived at.

The store in developing its authorization system should have a number of objectives. First of all, the system should be an accurate one, reducing to a disappearing minimum expensive mistakes. Second, the system should be fast. Third, the embarrassment caused the customer should be small at most, and absent in nearly all cases.

The authorization task is best considered with specific regard for several devices which are used in relation to it. The first of these is the authorization file.

Big and Little Authorization Files

CHARGE purchases are of two kinds. If the customer takes the merchandise, the purchase is a "charge-take." If the goods are to be delivered, the purchase is a "charge-send." The problem of authorization centers around charge-takes more than charge-sends, for obvious reasons. There is abundant time to check up on charge-sends before delivery.

In larger stores, communicating systems from the sales floor to office are in general use. There are mechanical overhead carriers, pneumatic-tube systems, and telephone systems. Telephone systems are in smaller stores sometimes a house-type phone matter; in larger stores, special electric-phone systems have been installed.

Over the telephone, of course, sales slip information is repeated to an employee who has access to office files, who refers to these, and who then authorizes or otherwise.

Carriers take the sales slip to the office, where it is checked on, and if the reference is satisfactory, an O.K. is stamped on it before it is returned to the sales person.

Now, while the charge is being

checked on in the office, the authorization files come into use. In small businesses, a common condition is authorization direct from the ledgers. Unless, to the authorizing employee, the customer's good credit standing is known, the ledger record is consulted, and the decision made on the basis of this. In cases where it is not satisfactory, the customer will be asked to visit the office.

Files especially for authorization purposes are in extensive use because they tremendously simplify and hasten the authorization process. These, in modern usage, are practically all visible files. There are many different types—the sliding panel, for example; the rotary visible file, a series of panels around a post.

Signals are used to give information. If an account is clear, a glance tells the office employee of the fact. If there is a credit limit, another signal, or possibly even the stated amount, appraises the condition to be considered in relation to the purchase which has been made. If the account is closed, that is known. Another color may signal, "Summon to office."

These visible files, with signal systems, immensely facilitate authorization.

Duplicate authorization files are sometimes maintained. There is one file in the office, and another on the sales floor, at some point concealed from the customer. It may be near the wrapping counter. Such files deserve wider use.

Another system, in those communities where sales people are widely acquainted with store customers is the stop-list. This is posted near the cash register, and as customers buy on credit the sales person flashes the list. If credit has been stopped, he knows this before goods are released.

The Authorization Limit

THIS is a convenient device to minimize time consumed in consulting files and ledgers. On charge-takes up to \$5, \$10, or some other figure, sales people, provided they are acquainted with the customer, are not required to secure authorization. In some department stores, on small purchases, such as \$2, \$3, sales people take the customer's word for it that he is on the books. He gets the goods immediately. Experience has

demonstrated to these stores that any loss occasionally suffered through fraud is small beside the benefits derived.

The operation of this system in other instances requires the employee authorizing to consult store ledgers, or refer to the credit manager, when the purchase exceeds an indicated amount.

With the use of limits, authorization routines can be immensely simplified. Getting up a limit plan, individual stores should have regard for averages under its own operating conditions. A limit plan thoroughly safe for one store might lose heavily for another; and vice versa.

Identifying the Customer

IDENTIFICATION with charge-sends ceases to be a task, because the address to which the goods are to be delivered can be checked against the store files.

What shall a sales person do about strangers who wish to carry away merchandise charged to an account? Much judgment enters here. In the small store, the new sales person unfamiliar with a customer will seize an opportunity discreetly to check on him with another member of the store organization likely to know him. When identification material is asked for stores usually are satisfied with letters, lodge membership cards, automobile license cards, and the like, which check with the name claimed by the party. It is true that fraud occasionally is worked on the basis of stolen material of this sort, but not often. Moreover, "impression" will count for considerable with the store.

If the stranger appears to be all that he claims to be, impresses with his personal appearance, that is a factor which enters into the decision.

Some stores require the buyer in cases of this sort to sign the sales slip. That is valuable in the event fraud is being practiced.

A tactful store employee can carry on a conversation with a stranger which will largely confirm—or otherwise—that he owns the name he claims to own.

Where doubt exists, the store should require positive identification. This can be through the medium of a third person whose character is well known in the store. A device may be a conversation so

(Continued on Page 58)

House-to-House Selling

By HARRY P. BRIDGE, Jr.

AS ORIGINALLY planned, this article was to tell why a well-known Eastern radio dealer did not believe in house-to-house selling. But times change, and good business men change with them.

"I'm sorry, Bridge," he said when I called for the interview, "but I'm afraid you're not going to get your story. I've been doing a lot of heavy thinking and investigating since we talked this thing over. I'm still opposed to door-bell ringing on general principles. But, just the same, I'm going to give it a trial."

"Fine!" I exclaimed. "Then that's our story. Certainly there must be some interesting facts connected with your decision. Let's have them."

He did . . . and, although he was perfectly willing to talk, he preferred that his name be omitted from the article. The facts as he gave them, however, are none the less interesting. Here they are:

"Up near Concord Bridge in Massachusetts, where the first British soldiers fell during the Revolution, you will find an epitaph written by a Yankee. It reads: 'They came three thousand miles to die to keep the past upon the throne!' It may seem a far cry from these graves to a modern radio business, but the principle of this epitaph is applicable to all business in general and this problem in particular. Times change. You must change with them. It's not only foolish, but frequently costly to keep the past on the throne in business. Up to now I've never favored exclusive outdoor men for the type of stores with which I have been associated, but I've changed my mind to the extent of giving them a fair trial.

"Business in general hasn't been so good lately. The radio game in particular isn't what it used to be. The incompetents are being weeded out and competition is tightening up. The recent dumping of sets by certain manufacturers didn't help things any as far as the dealer was concerned. Then, too, revolutionary new developments have quit coming along to render sets obsolete and make repeat buyers out of old. A great many homes now have satisfactory radio equipment and radio prospects who

hunt you out at your store are becoming fewer and farther between.

"For the first time in its life, our business is developing into a real selling proposition. People used to enthuse themselves with the idea of owning a radio. Then they would come in and buy one that suited their fancy. That was a spontaneous market. Now, however, it is up to us to interest the rest of the people first and then sell them the sets we think they should buy. That's where I believe the door-to-door men are going to fit into our picture.

"When people won't come to us in sufficient numbers, we'll have to go to them. We may not like to do it. We may realize it's a tough job and sort of feel that, generally speaking, it's a little out of our line. At the same time we must recognize the fact that competitors are making sales that way—and by competitors I mean not only other radio dealers, but appliance men in all lines. We're all looking for pretty much the same share of the consumer's dollar.

"From investigation, I know that radio house-to-house salesmen do an awful lot of cold turkey canvassing to make a single sale. What is more, there is rapid turnover among salesmen and a great deal of assorted grief. At the same time, these men are producing some business, and, occasionally, I have run across a dealer who is making a real profit through them. Most of them would show a loss if a careful check were made, but I've come to the conclusion that this is largely due to their own inefficiency.

"Of course I'm not going into this thing blindfolded. In the first place, I obtained all the information on the subject I could get. The result has been a firm belief that there is a mighty fine line of distinction to be drawn between the methods of successful concerns and those that are not doing so well. It is frequently pretty hard to say why one is good and another is bad, but it seems to me that the answer is in careful management and attention to detail.

"Outdoor selling should be done right, or not at all. This means that the men must be carefully selected, trained and every effort made to help them produce. I think that one of the



greatest mistakes ever made by dealers is to go in for haphazard outdoor selling on the assumption that they have no responsibility simply because the men are paid on a commission basis and don't cost the store anything until they begin to produce. Inefficient or discourteous men can mean a lot to a business in the form of lost prestige or forced sales to customers who really don't want the merchandise for which they signed.

"Even at best, outdoor salesmen aren't so hot as a class. Many of them pick on the work after they have failed in everything else or because they lack ambition to hold down a steady job. They're hard to handle, still harder to train, and harder yet to be led to produce a living wage for themselves and a profit for the company. That's why extreme care in management seems so necessary to me.

"At the same time, I have been convinced that too much stress has been placed on the bad features of the rapid turnover among salesmen. This is, of course, a real problem, but one that has its bright side, and I intend to make the most of it. Almost any salesman can produce a few sales. Good or bad, he has a few friends or relatives who will buy from him if only to help him along, or because he has promised to split his commission with them. Then, too, he is almost certain to uncover a few prospects before decamping for parts unknown. All of this means a few sales and, while I won't hire men on this basis, it is a fact which again proves that even a dark cloud has its silver lining.

"I know one dealer whose success—such as it is—rests largely on a realization of this fact. He never expects men to stay with him more than a few weeks or to produce more than a few sales of the type mentioned. His ads appear regularly in the 'Help Wanted' columns. Men come and go in a steady stream, but each, true to form, leaves a couple of signed sales contracts behind him.

Personally, however, I think the bubble will burst some day. Forced sales with plenty of collection difficulties are almost sure to result. Besides, such a method savors strongly of mere price cutting, and I never did believe in that. Even if I did, I would want to do my own cutting—not rely on a salesman to do it for me.

“Don’t think, however, that outdoor selling is altogether a new experience with me. In speaking of it here, I have been referring to what is called the cold turkey canvass. For a long time past salesmen in our store have been spending 50 per cent or more of their time out of the store with good results. Now, in line with the trend toward more aggressive merchandising, I’m going to carry this selling a step further. It seems to be the only logical way of getting more business under present conditions. It will mean more work on my part, more office equipment and a girl to keep track of the records, another truck for deliveries and demonstrations and a 25 per cent larger stock of sets, but I feel that it is necessary.”

The system referred to whereby this dealer’s men have been accustomed to spend a great deal of their time out of the store has proved decidedly worthwhile. In this work, however, they have only contacted definite leads where the prospect has evidenced his interest in radio by visiting the store. It is a rule that salesmen are to obtain the name and address of everyone who comes in to look at sets. This is easily done by saying that they want to put them on the list to receive a little monthly publication containing radio news and interesting information regarding broadcasts.

A careful check is kept on all prospects. Thus, when one does not show up within a reasonable length of time—perhaps a week—the salesman who contacted him in the store calls at his home in an effort to obtain permission to make a home demonstration.

This plan has proved singularly successful. Most prospects for sets now do more than a little shopping around before coming to a decision, and this show of real interest on the part of one of the stores they visited makes a good impression. Not infrequently salesmen arrive in time to make sales even though other sets from competing dealers may already be on demonstration in the homes. These men take charge of all demonstrations to their own prospects and also call a couple of times at the home after sales have been made, this being done not only to insure satisfaction, but, equally important, to uncover the names of any friends or relatives who may have evinced interest in owning a similar set.

Naturally, these salesmen are of the highest type available for the work, having been carefully trained as a result

A DOZEN DON'TS FOR OUTSIDE SELLING

HERE are some pointers on handling the house-to-house radio salesman as gleaned from the experience of leading successful dealers. Not all of them may prove applicable to your business but all can be studied to advantage:

1. Don't expect to get men of the highest type for door-to-door work. Select the best bets from among those who apply and then make a consistent effort to help them produce a living wage for themselves and a profit for you.

2. Don't insist on previous outdoor sales experience. Some of the most successful salesmen of this type have been recruited from the ranks of ex-grocers, postmen, taxi drivers and street car conductors.

3. Don't let house-to-house men shift for themselves. Train them carefully and then supervise their efforts.

4. Don't hire men on a straight commission basis—unless you will be satisfied with the poorest salesmen. Show your belief in your own proposition by paying a small salary or by allowing the men a drawing account.

5. Don't fail to make the proper preparation in your store for outside selling. You will need adequate records, a larger stock of sets and full facilities for prompt delivery.

6. Don't send men out without proper training. Untrained or discourteous men can do a lot of damage to a store's reputation—especially in a small community.

7. Don't take sales for granted upon presentation of a signed contract by the salesman. Verify them immediately by telephone or personal call. Pay no commissions before verification.

8. Don't allow door-to-door men to operate in overlapping territories without definite agreement as to just what is what.

9. Don't overlook the value of sales contests—especially if you employ a number of men or outdoor crews. They may seem like “old stuff” but sales contests can still be made to produce good results.

10. Don't go in for high-pressure methods. These might produce business for “foreign” concerns who do not have to rely on repeat business from a community but they are no good for a local store.

11. Don't expect house-to-house salesmen to do collecting as well as selling—but see to it that they call back several times at homes where sales have been made. These visits mean satisfied customers and are productive of many new leads.

12. Don't neglect your store in favor of outdoor selling. After all, the store represents your bread-and-butter business to which the house-to-house man, however successful he may be, is only an adjunct.

of their experience behind the counters in the store. They will, the manager feels, form a valuable basis for a cold turkey door-to-door force in that, while sticking to their usual routine, they can do much toward training the men who will spend all of their time out of the store carrying the selling fight to the doorsteps of the consumer.

TEN SHORT CUTS TO THE POORHOUSE

By ERNEST W. FAIR

1. When your customer enters the store never take the trouble of saying “Good morning” or “Good afternoon” in a pleasant tone of voice but growl gruffly with this salutation, “What do you want?”

2. When the customer remarks that he would like to see a radio, let on that you didn't hear him. Be sure that your mind is a thousand miles away from the sale before you.

3. Never be careful or courteous; see that the customer bumps into as many sets on display as possible. Be sure to be awkward, bump into him or her and instead of saying “Pardon me” growl gruffly under your breath.

4. Turn on every set in the house; make your demonstration one of noise. Make all the noise you can. The reason the customer is buying the set is to keep the neighbors awake. Be sure to try to sell the set on that quality.

5. Never demonstrate the way the customer wants a demonstration. Shoot from one station to another until you have your customer sitting on the edge of his or her chair. Use plenty of volume. Get the worst programs. And don't forget to make a determined effort to make more noise yourself than the radio.

6. Be high-hat; show the customer you are above him, that you are much better than he is and that you think he is so much scum; bear in mind that the customer wouldn't have any brains or they would be listening to a better set.

7. Be sure to impress on them the sad state of affairs the “old man's” business is in with the punk line he's handling.

8. Be sure to put over the fact that you are the only wise one in the whole business and that you could place all the brains of the rest of the bunch in a peanut shell.

9. Don't wear clean clothes, and for heaven's sake never have a crease in your trousers. Dirty hair and teeth also help materially.

10. Be sure to give the impression that it doesn't make any difference to you whether the sale is made or not; in fact, that you'd much rather be elsewhere at the present moment.

P. S.—The road to the poor house isn't paved, so be sure and take your uncle's overshoes with you.



Selling Radio by Recorded Music



NAT SHILKRET and the Victor Orchestra have a very snappy dance number entitled, "Get Happy," Victor No. 22444-A. The work of the trumpets and stringed instruments is brilliant and the rhythm is excellent. The vocal trio launches out on a rollicking negro spiritual; that is, a white man's idea of a negro spiritual. The nearest some whites get to an expression of the soul is in the writing of a negro spiritual to fox trot time. Nevertheless, "Get Happy" is a good jazzy tune and useful in demonstrating combinations.

On the other side of this record The High Hatters play, "My Future Just Passed," one of the hits from the Paramount picture, "Safety in Numbers." This is another good, snappy, hop, skip and jump dance recording, with some very clever words in the vocal refrain. The highs are good; bass pretty good. It sounds lower than it really is, therefore serves the purpose more than well for demonstrating.

"**A**ROUND THE CORNER," Victor record No. 22459-A is a popular dance piece. It is played by Leo Reisman and his orchestra, who play, on the other side, "Bye Bye Blues." Both are full of rhythm, but there is nothing outstanding in the way of tonal effects in either. They are mentioned here, however, because there is a possibility that tonal effects don't mean a thing to the type of person that buys this type of record. Salesmen should always remember that the choice of the record very often sells the set; that people often base their opinion upon the effect a demonstration has upon them.

FOR the person that looks like he might like classical music, especially vocal classics, Victor record No. 3054 is excellent. It contains two vocal duets from Traviata, "Un Di Felice" (Rapturous Moment!), on one side and "Parigi O Cara" (Far from Gay Paris), on the other; both sung by Amelita Galli Curci and Tito Schipa. The orchestral accompaniment is splendid and the two voices blend beautifully. Schipa, by the way, is pronounced Skeepa, and Curci, Koor'chee.

JESSE CRAWFORD is always popular. For color, novelty and individuality he has no peer. His latest rec-

ord, Victor No. 22333, has "Ah, Sweet Mystery of Life" from Naughty Marietta, on one side, and "Gypsy Love Song" from The Fortune Teller on the other. Both light operas are by the much loved American composer, Victor Herbert. The first selection is full of excellent bass throughout, not to mention some splendid high tones from the harp and bells in the background. This wide separation of the extreme frequencies makes it an unusual demonstrating record as well as an enjoyable one to listen to. Good bass and fine brilliance are recorded in the second side; and both are typically Jesse Crawford and his Wurlitzer organ; with all the theatrical effects that have made him America's most popular organist.

THIS month's "Record of the Month," as chosen by Victor's group of judges, is "Le Coq d'Or" (pronounced merely Luh Coke Door), played by the London Symphony Orchestra, conducted by Albert Coates. Le Coq d'Or is Rimsky-Korsakow's last opera and is highly descriptive and colorful, the first part bearing great resemblance to the "Hymn to the Sun" and the second, "The Bridal Cortège," being typical of a Russian celebration. The first part is brilliant in the extreme, starting with a trumpet ensemble. It has the Oriental tang made famous by the composer, enhanced by flute runs, and bells, and brass ensembles and string pizzicato which is very effective. On the "B" side the bass is very full, the piccolos holding down the other extreme excellently. This side ends in a very powerful full orchestra, which should delight even the most hardened jazz lover.

LEW WHITE has a popular organ number in Brunswick record No. 4833. On one side is "California Sunshine," on the other "Down the River of Golden Dreams." With the organ are a marimba and a steel guitar, both of which give some very pleasing effects. The bass is good on both sides,

not being overdone in the least, while the highs are brought out splendidly by the guitar.

THE Brunswick 90000 series are recorded in Europe. There is one, No. 90055, which is a very interesting, if not fascinating, selection. It contains two numbers played by a French concert orchestra under the leadership of Albert Wolff; first, "Marche Joyeuse" by Chabrier, and second, "Bourrée Fantasque," by the same composer. Both are unusually brilliant and full of high notes, as of the violins and piccolos, and throughout the recording is marvelous. In truth there are moments when the listener would swear that he was hearing ten acres of orchestra, and that every instrument was played under an individual microphone. It would almost be safe to say that such brilliance and such fullness of the higher instruments have never been so splendidly reproduced in this country.

PAUL WHITEMAN's latest number Columbia record No. 2224-D, on which "Sittin' on a Rainbow" and "Old New England Moon" are recorded, is clever, as usual. The first is brilliant and backed with lots of bass; the second is one of those crooning waltzes, with nice bell and bass effects in a background for a vocal refrain. It is typically Paul Whiteman and therefore very popular, although the recording is not as clear as it might be.

FOR some reason, "Under Vesuvian Skies" and "June Kisses," as played by Henry Thies and his orchestra, was claimed Victor Popular Record of the Month of August by the Victor judges. All of which gives it a good send-off as a demonstrator. It did not strike this reviewer as being worthy of such acclaim, however, although its rhythm is splendid. The bass is good, trumpet and trombone solos and vocal refrain pretty good, if one can enjoy muted instruments. "June Kisses" is better, and is very good for pointing out the bass and the treble on a receiver. The rhythm, however, is the outstanding feature of both sides, and was undoubtedly the cause for its being elected to the hall of fame.

What Causes Good Tone Quality From a Radio

By HECKERT L. PARKER

THE pleasing reproduction of vocal sounds by a radio set depends as much upon the voice quality of the speaker or singer as upon the radio itself. Consequently the radio salesman ought to know something about the various terms which refer to the human voice so that he can intelligently discuss the merits of radio announcers, speakers and singers.

Differences in the production of voice sounds are caused by differences in the mouth and nose cavities and in the movement of the tongue and lips. These differences are manifested in the number and character of overtones which give each voice its peculiar qualities. The head cavities, which form a resonating chamber, are fixed in size and shape and cannot be changed by training. The muscles of the chest, throat, mouth, lips and tongue can be trained for the control of breath and enunciation.

The "register" of a voice, i. e., the fundamental frequencies of its natural tones, is largely determined by the inherited organs of speech. Its range, i. e., the number of different fundamental tones that a person uses, can be extended by training. Thus a natural baritone can be trained to sing well down into the bass or a contralto up into the soprano. The normal range of a tenor voice is from 128 to 512 cycles per second, i. e., from C₁ to C₃; of a baritone from 96 to 384 cycles; of a bass from 85 to 341 cycles; or a soprano from 256

to 1024 cycles, and of an alto from 170 to 640 cycles.

The range of a voice has nothing to do with its quality, which is determined by its overtones. As certain frequencies are eliminated by filters in a laboratory, a voice loses its timbre and tone color even while it is understandable. Such a filtering action occurs to more or less extent in a long distance telephone line whereby chain programs are transmitted. While the effect on speech is hardly noticeable, since there is little attenuation in the band of frequencies from 200 to 2000 cycles, music often sounds "thin" because of the absence of very low and very high frequencies. For this reason the best demonstration of the music reproducing ability of a radio can be had from a good local program. If it is necessary to demonstrate on a chain program which is defective in tonal quality the salesman should explain why.

THE tone of speech or music is sometimes objectionably affected by the resonance of the speaker compartment in the radio set. A tone whose frequency is the same as the natural period of vibration of the air space in the speaker compartment, or of one of its sides, will be unduly emphasized. Thus the "barrelly" sounds of speech or music are due to too much emphasis of the low notes. The solidier the cabinet the less is the chance for such resonance effects.

Furthermore, a room may be resonant to certain tones. When a sound

wave comes in contact with the walls, floor and ceilings part of it is absorbed and part of it is reflected. Soft and porous materials absorb certain frequencies more than they do others, just as hard and smooth materials reflect them. Thus some tones may be emphasized and others softened. If a sound persists in a room after its source has ceased to vibrate to that tone it may cause a reverberation in which certain sounds overlap others. This may cause dead spots in some parts of a room and loud spots in others. Such defects can often be corrected by shifting the position of the radio and by using wall coverings that will absorb rather than reflect the sound.

Another method of correcting the poor acoustics of a room, resonance, or defects in broadcasting, is the use of a tone control attachment whereby objectionable frequencies can be eliminated. This may also be helpful in mitigating the effect of natural and man-made static, though the latter source of interference should be investigated and removed by an expert.

In so far as the tone quality of a receiver is affected by distortions caused by the receiver itself, the non-technical salesman will have to abide by the verdict of the service man and not attempt to fathom its mysteries or go very far with explanations or excuses to users or prospects. Distortion can be caused at one or more points, such as a poor tube, overloaded tube or tubes, defective or overloaded speaker, transformer, etc., wrong plate or grid voltages applied to tubes, and high or low voltage of the electrical supply current. Until experienced, the salesman should familiarize himself with the tone quality and performance of a set known to be in normal condition; then he will be able to recognize when that model or make is not up to standard.

RADIO BOOKKEEPING SYSTEM

(Continued from Page 26)

Q. Do I need an adding machine?

A. An adding machine saves time and insures accuracy and speeds up the work greatly. I wouldn't say it is absolutely essential, but feel sure any business, regardless of how small, will find such a machine will more than pay for itself. If you buy one, get one that also subtracts. The extra expense is small, but the utility of the machine is just about doubled.

Q. What happens to the daily bunch of charge tickets, after they are taken from the cash register and entered in the cash book?

A. They should be saved, to refer back to, if necessary. I suggest you buy a box of large cheap envelopes and use one for each bunch of slips and tickets corresponding to a set of entries in the cash book. Either date them or number them and file them in perfect order so that you may get at them if desired.

Q. How am I going to tell into what department any certain article goes for the accounting?

A. Complete sets and tubes and labor almost separate themselves. Parts and ac-

cessories may cover many items, such as repair parts for sets, whether regularly handled by you or bought especially for a repair job. Phonograph pick-ups and similar devices would come under this heading. Be sure that when you sell an article it is credited into the same department that it was debited into on the expense side when you bought it. Anything that cannot legitimately be charged to any one certain department constitutes general expense. You will find in practice that this separating of items is easy and takes but a few moments.

Q. Isn't all this departmentizing a lot of unnecessary work?

A. No, I think it is highly important. You may be astonished at the losses going on in some department of your business which will be quickly uncovered. Labor is a common source of loss—watch it. And tubes, also. Remember, "forewarned is forearmed."

Q. What is meant by "stock turnover"?

A. As commonly used, it refers to the number of times a dealer's stock is "turned over" per year; that is, how often the stock is sold and replenished. The oftener the "turnover" the more profit. For example: Suppose you carry an average stock of

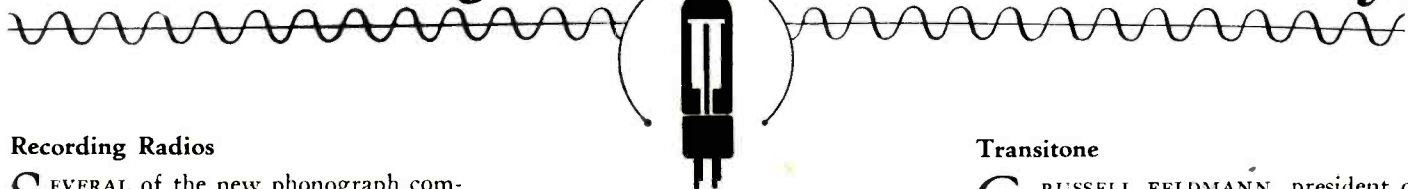
\$2000, and that your total sales average \$2000 per month. You are making twelve "turnovers" per year. If it were possible to carry an average stock of only \$1000, but still sell \$2000 per month, you would be making 24 turnovers per year, and your profit would be greater for at least two reasons—first, interest on \$1000 invested is only half that on \$2000; second, the oftener you turn your stock over the fresher and more up to date your merchandise is, and the less chance you have of taking a loss on any of it.

Q. How does this system of bookkeeping help in the matter of "turnover"?

A. By departmentizing the business, showing up slow selling articles and plainly indicating faster moving departments (with their consequent greater profit-producing). Also by keeping figures on the amount of purchases instantly before you and giving you easy access to the amount of stock on hand—all your essential business figures are right there ready to be of use and ready to guide you.

Note: In future issues we will gladly answer readers' questions. Write them as they come up in using the system and let us hear from you.

NEWS of the Radio Industry



Recording Radios

SEVERAL of the new phonograph combination radios, including the Victor, R. C. A., General Electric, Westinghouse and Graybar, are equipped with a simple hand microphone and recording mechanism whereby the user can make his own phonograph records. Thus it is possible to preserve any favorite broadcast features or home production of voice or music for future reproduction.

The pick-up unit is fitted with a special cutting needle for recording on six-inch cellulose discs which are pre-grooved on both sides. The record may be played-back perhaps fifty times with a regular needle. At 78 revolutions per minute the record will play for 70 seconds. No claim is made that the home-recorded program has the quality of a standard record, but the tone is true enough to be recognizable.

Kolster Reorganization Planned

FOLLOWING the legal decision that there had been no "rigging of the market" in the sale of Kolster Radio Corporation stock, S. P. Woodward & Co., Inc., of New York City, submitted to the receivers an offer to take over the remaining assets of the corporation and to organize a new company whose notes and stock will be used to retain outstanding obligations.

200-Kilowatt Tubes

THE new AW-220 tube to be used in the transmitter at KDKA at Saxonsburg, Pa., has an output of 200 kilowatts. It is 72 inches high, 8 inches in diameter and weighs 60 pounds. During operation it requires about 5 tons of water per hour to keep it cool.

Continental Reorganized

CONTINENTAL Radio Corp. of Fort Wayne, Ind., manufacturer of "Star Raider" radios, has been refinanced and reorganized so as to be in production during the current season. Among the new officers of the company are Carl D. Boyd, president; R. J. Beatty, chairman of the board; W. W. Dowdell, vice-president, and John Hockery, treasurer. A complete sales force has been created and a new merchandising plan devised.

Brunswick Award

BRUNSWICK RADIO CORPORATION announces an annual trophy for the broadcast achievement which has, by its conception, made an outstanding and vital contribution to the life of the American people. The award may go to an individual broadcaster, commercial sponsor, agency or station. It may be for a program or for a semi-technical achievement.

T. C. A. Business

ROSS D. SIRAGUSA, president of the Transformer Corporation of America, reports that the volume of its business in radio parts is greater than in the banner year of 1928. Yet its business in Clarion sets is ten times greater than its business in parts. He also reports gratifying results from the Clarion balloon races which were staged by various distributors throughout the country. The company has started production on the Clarion Junior, a midget set which has tone control, electrodynamic speaker, phonograph jack, and illuminated dial. It lists at \$47.50, including tubes, four screen-grids and two '45s. Officials announce that the business is free from loans and funded indebtedness and is being conducted in such a way as to conserve costs, create no over-stock and supply a market commanded in advance.

Midget Supers

SUPERHETERODYNE receivers in mantel type cabinets are being rushed into production by a number of manufacturers. Prices are to be lower than those of r.f. sets in large cabinets. Some manufacturers are making both a-c and d-c models, the latter being equipped with a carrying case for use in autos and motorboats, as well as in the home. Energetic efforts are planned to go after the low-price market during the coming season.

New 210 Tube from Triad

TRIAD Mfg. Co., Inc., of Pawtucket, R. I., announce a new type 210 power amplifier and oscillator which has a thoriated tungsten filament in combination with molybdenum plates instead of oxide coated filament and nickel plates. Life tests show a steady maintenance of characteristics beyond a period of 1500 hours with an oscillating load of 60 milliamperes.

Transitone

RUSSELL FELDMANN, president of C. Automobile Radio Corp., announces that Transitone automobile radios have been adopted as standard equipment of closed body styles of Chrysler, De Soto, Dodge, Franklin, Hupmobile, Jordan, Packard, Peerless, Pierce-Arrow, Plymouth and Studebaker cars, all of whose dealers are authorized to sell Transitone. The sets are made by Philco, whose dealers, as well as all Willard service stations, are also authorized to sell them.

Tube Replacements

ERNEST KAUER, president of the CeCo Manufacturing Company, states that tubes are guaranteed for a certain length of time and tubes made by reputable manufacturers do give satisfaction for this guaranteed period. If, as sometimes happens, the customer uses a tube five months and then brings it in to his dealer, saying it is unsatisfactory, and asks for a replacement, what ought the dealer do? This is the situation that happens all too frequently.

"The dealer does himself a disservice and works a hardship on the manufacturer if he too easily accepts the return and ships it back to the manufacturer for credit. He would be a better dealer and a smarter merchant if he sold that customer a new tube. He would not only save himself the trouble the transaction causes him, and save the manufacturer the investment in the tube, but he would also net himself an additional profit.

"I venture to say that 70 per cent of all replacement annoyances could be avoided by a stricter attitude on the part of the dealers and that their profits would be up considerably. It is proper to see that the consumer gets all that he pays for. He is entitled to that, but not a bit more. We should be fair to ourselves as well as to the public."

Speedy Speed Service

Within one week after a fire which destroyed the Los Angeles warehouse stock of Speed tubes a new stock of 15,000 tubes was supplied from other warehouses.

Vreeland Sues Majestic

Vreeland Corporation has filed suit against Grigsby-Grunow Corporation for alleged infringement of the "Band Selector" patents.

Who Distributes It Now

"The Greatest problem in the efficient and economical movement of radio products from the maker to the user is in the development of better channels of distribution."

Baldwin

Nathaniel Baldwin, Incorporated, of Chicago, announce the following new jobbers which will handle their products in the various territories: D. B. Stewart and Company, 123 South Tioga Street, Ithaca, New York, covering the southeastern part of New York State and three counties in the northeastern part of Pennsylvania. F. J. Reynolds, 907 Florida Avenue, Tampa, Florida, covering the central part of Florida.

Bosch

Collins-Lane Co., Ltd., Los Angeles, have been appointed as distributors for Bosch radio in Southern California.

Brunswick

J. A. Williams Company of Pittsburgh, Pennsylvania, have been appointed as distributors for the Brunswick line in that territory, succeeding the Kelvinator-Leonard Corporation, which has discontinued radio.

CeCo.

CeCo Manufacturing Company, Inc., have appointed Call, Carley and Jordan of Richmond, Va., and J. H. Ambrose Co. of Syracuse, N. Y., as factory representatives.

Condenser Corp. of America

The Condenser Corporation of America, Jersey City, N. J., recently appointed Dorman S. Hill and Associates of Chicago as Illinois, Wisconsin and Michigan representatives.

Crosley and Amrad

Nott-Atwater Co., Spokane, Washington, are distributors of Crosley and Amrad radios for eastern Washington and Idaho.

Colonial

Colonial Radio Corporation, Long Island City, New York, has appointed new distributors as follows: Anderson and Company, Buffalo, New York; Chesapeake Furniture Company, Richmond, Virginia; Electric Appliance Company, Pittsburgh, Pennsylvania; Electric Corporation, San Francisco, California; Grier Sutherland Company, Detroit, Michigan; Haas Electric Sales Company, Cleveland, Ohio; M. A. Hartley and Company, Northumberland and Gettysburg, Pennsylvania; Kemp Equipment Co., Rochester, New York; Lappin Electric Company, Milwaukee, Wisconsin; Lewis Radio Company, Philadelphia, Pennsylvania; Marshall-Wells Company, Duluth, Minnesota; Marshall-Wells Company, Portland, Oregon; Seattle, Washington, Minneapolis, Minnesota; H. A. McRae and Company, Troy, New York; Morosco Distributing Company, Poughkeepsie, New York; Penn-Cliff Service Company, Baltimore, Maryland; Risley-Leete Company, New Haven, Connecticut; Syracuse Auto Supply Company, Syracuse, New York; Vega Company, Incorporated, Boston, Massachusetts; Triangle Electric Company, Chicago, Illinois.

Clarion

Transformer Corp. of America announce the appointment of Blackman Distributing Company, Inc., of New York City, as ex-

clusive distributor of Clarion radio in twenty-eight counties of New York State, including Greater New York.

Gulbransen Champion

The Gulbransen Company of Chicago, manufacturers of the "Champion" set, announce the appointment of the Supplee Biddle Hardware Company of Philadelphia, the Hackett, Gates, Hurty Company of St. Paul, The Wagner Hardware Company, Mansfield, Ohio, and the Drake Hardware Company of Burlington, Iowa, as distributors.

Gosilco

The Gosilco Radio Products Company of Huntington Park, California, have appointed Southern Sellers of New Orleans, Louisiana, exclusive factory representatives for Louisiana, Mississippi and Alabama.

Lyric

Eugene R. Farny, president All-American Mohawk Corporation, has announced the appointment of the Rocky Mountain Radio Corp. of Denver as distributor for Lyric radios in Colorado, New Mexico and Wyoming, and of the Domestic Specialties Co. of San Francisco and Los Angeles as distributors in California, Arizona and Nevada.

Radiola

E. A. Nicholas, Incorporated, of Chicago and South Bend, has been appointed Radiola distributor for northern Illinois, northern Indiana, and southern Michigan, Southern Radio Distributors, Incorporated, of Miami, with branch offices at Jacksonville and Tampa, will serve Florida. The territory of the Radio Distributing Corporation of Newark, New Jersey, has been extended to include ten and a half counties in Pennsylvania, to be served from a new branch office at Scranton.

Story and Clark

Radio by Story and Clark is represented by Lemke Electrical Company, at Milwaukee, Wisconsin, as exclusive distributors.

Standard Transformer Corp.

The Standard Transformer Corp., with offices and factory at 852 Blackhawk Street, Chicago, has been organized by Jerome J. Kahn and C. R. Bluzat, formerly sales manager and sales engineer respectively with the Transformer Corporation of America.

The plant is in production on a complete line of power transformers, audio transformers and chokes—on a contract basis.

Triad

The Triad Manufacturing Company of Pawtucket, R. I., manufacturers of the Triad radio tubes, have recently appointed the following new factory representatives: Sam Rochester, 642 Cokesbury Avenue, Baltimore, Md.; Bell and Company, 2362 University Avenue, St. Paul, Minn., and Jules W. Beneke, 1689 Arcade Building, St. Louis, Mo.

Westinghouse

Westinghouse Radio is distributed by Wetmore-Savage Electric Supply Company, Boston, Providence, R. I., Springfield, Mass.;

Worcester, Mass.; Elmira Electric Supply Company, Elmira, N. Y.; Fobes Supply Company, Portland and Seattle. The Mook Electric Supply Company, Akron, Canton and Youngstown, Ohio; Gilham Electric Company, Atlanta, Ga.; Moore-Keandley Hardware Company, Birmingham, Ala.; Superior Supply Company, Bluefield, W. Va.; McCarthy Bros. and Ford, Buffalo, N. Y.; Johnson Electric Supply Company, Cincinnati, O.; Mann Electric Supply Company, Columbia, S. C.; Hughes Peters Electric Corp., Columbus, O.; Mills and Lupton Supply Company, Chattanooga, Tenn.; Mine and Smelter Supply Company, Denver and El Paso; Star Electric Company, Erie, Pa.; Banks-Miller Supply Company, Huntington, W. Va.; Columbian Electric Company, Kansas City, Mo.; Tafel Electric Company, Louisville, Ky.; Hessel and Happen Company, New Haven, Conn.; Electric Supply Company, New Orleans; Times Appliance Company, New York City; Iron City Electric Company, Pittsburgh, Pa.; Inter-Mountain Electric Company, Salt Lake City; Pennsylvania Electric Company, Scranton; United Electric Company, Wichita, Kansas; and Westinghouse Electric Supply Company, Albany, N. Y., Allentown, Pa.; Baltimore, Md.; Binghamton, N. Y.; Brooklyn, N. Y.; Butte, Mont.; Charlotte, N. C.; Chicago, Ill.; Cleveland, Ohio; Dallas, Texas; Des Moines, Ia.; Detroit, Mich.; Duluth, Minn.; Evansville, Ind.; Fargo, N. D.; Flint, Mich.; Grand Rapids, Mich.; Houston, Texas; Indianapolis, Ind.; Jacksonville, Fla.; Los Angeles, Calif.; Madison, Wis.; Mason City, Ia.; Memphis, Tenn.; Miami, Fla.; Milwaukee, Wis.; Minneapolis, Minn.; Newark, N. J.; New York City; Oklahoma City, Okla.; Omaha, Neb.; Peoria, Ill.; Philadelphia, Phoenix, Ariz.; Reading, Pa.; Rochester, N. Y.; San Antonio, Tex.; San Francisco; Sioux City, Ia.; Spokane, Wash.; St. Louis, Mo.; St. Paul, Minn.; Syracuse, N. Y.; Tampa, Fla.; Tulsa, Okla.; Toledo, O.; Trenton, N. J.; Utica, N. Y.; Washington, D. C.; Waterloo, Ia.; Wilmington, Del.; Worcester, Mass.; York, Pa. Raleigh, N. C.

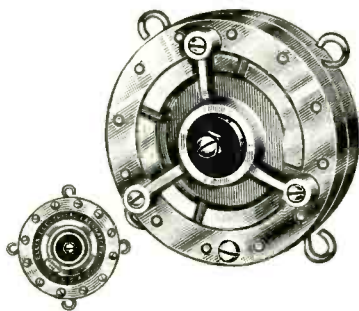
Zenith

A reassignment of territories covered by Zenith field representatives is announced by A. T. Haugh, general sales manager for the Zenith Radio Corporation of Chicago. The Zenith field personnel and the new territories assigned to them are as follows: Leo W. Reed: New England including Bangor, Boston, Rutland, New Haven and Albany. F. R. Mihlisen: Metropolitan New York and Philadelphia. C. A. Eyles: South-eastern including Maryland, Delaware, Virginia, North and South Carolina, Georgia, Florida, Alabama and Tennessee. C. J. Main: Central states, including Michigan, Indiana, Kentucky, West Virginia and Ohio. E. G. Hefter: Southwestern, covering Mississippi, Louisiana, Texas, Oklahoma, Arkansas, Missouri and Kansas. F. W. Will: Northwestern, covering Wisconsin, Illinois, Iowa, Nebraska, Wyoming, Montana, North and South Dakota and Minnesota. C. J. Pilliod, Jr.: West Coast, including California, Washington, Oregon, Nevada and Idaho.

New Radio Equipment

Ellis Microphones

Ellis Electrical Laboratory, Chicago, is supplying microphones of the two-button, stretched diaphragm, carbon granule type, for public address systems. The buttons have a micrometer adjustment



Ellis Two-Button Microphone

and are rigidly supported by a three-pillar construction. The instrument is designed to give uniform response at all audible frequencies and is responsive to 5 milliamperes at 3 volts. It is made in two sizes: $2\frac{7}{8}$ in. diameter at \$45 and $4\frac{1}{2}$ in. diameter at \$75. All necessary accessories are also supplied.

Supreme Set Analyzer

A new set analyzer, Model 90, made by Supreme Instruments Corp., Greenwood, Miss., allows for 79 possible readings while testing a radio set and yet employs but one meter. This meter is of the copper oxide rectifier type so that it gives a-c as well as d-c readings. It has only two scales: 0-3 and 0-9, higher ranges being obtained through convenient multiplier resistance of 10 and 100 times, respectively. For current readings it has five ranges up to 300 milliamperes and for voltage readings six



ranges up to 900 volts. These readings may be made directly from the set under test by means of an ingenious yet simple combination of push buttons and switches. It may be used to measure grid, plate and filament voltages and grid and plate current on all types of tubes, including pentodes. It measures resistances, reactances and capacities and provides high and low resistance continuity tests, battery for which is enclosed in the analyzer. Its size is $4\frac{1}{2}$ by $9\frac{1}{2}$ by $11\frac{1}{4}$ inches, its weight 6 pounds and its price \$78.50. It is accompanied by a complete manual of instructions.

Rauland Amplifiers

The Rauland Corp., Chicago, Ill., is placing a line of power amplifiers on the market. These are intended for the operation of from four to ten dynamic speakers in public address and centralized radio systems. They are made in both portable and panel models and require one '27 tube in the first stage, two 112A tubes in the second stage, and two



Rauland Type 55-F Power Amplifier for Mounting on Channel Rack

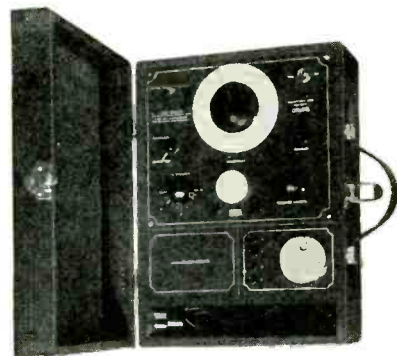
'50 tubes in the third stage, with two '81 rectifiers. The output is designed for either high or low impedance and the latter may be had in either fixed or variable type. The line also includes portable and panel mixers, pre-amplifiers, and microphone current supply units and other equipment for complete sound system installation.

The New Lyric

The new Lyric receiver, made by the All-American Mohawk Corp., tunes itself automatically to a pre-determined series of broadcast programs at definite times without human intervention. This is accomplished by a nine-position automatic tuner, an electric clock, and a mechanism which correlates their actions. The set is also equipped with tone control and automatic control of volume.

Dayrad Test Oscillator

The Radio Products Co., Dayton, Ohio, announces the Type 180 Dayrad test oscillator to cover the broadcast band, with extreme accuracy at 600 and 1400 kc. A simple switch also causes

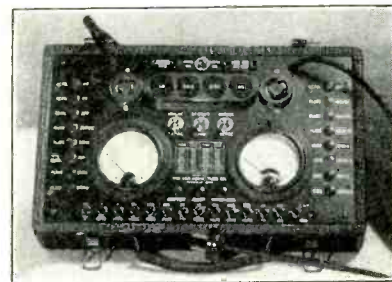


Dayrad Test Oscillator

it to oscillate at 175 or 180 kc. Visual indications of adjustments are given by an output meter of the copper oxide rectifier type. This instrument is useful in aligning, neutralizing and gauging r-f circuits in superheterodynes.

Flewelling Set Analyzer and Tube Checker

The new Flewelling combination analyzer and tube checker, manufactured by the Van Horne Tube Co., Franklin, Ohio, is designed to make a complete analysis of all circuit conditions in any radio receiver under the limits of 800 volts a-c or d-c and 100 milliamperes. It also includes a complete tube checker and panel chart of



New Flewelling Combination Analyzer and Tube Checker

tube ratings. It is made for use on 60-cycle 110-115-volt a-c circuits and can also be furnished for 25-cycle operation. The instrument is operated by push buttons, and through pin jacks supplies eleven meter ranges for external testing. The panel is 7 by 12 in. and the leather carrying case is $12\frac{3}{4}$ by 8 by $4\frac{1}{4}$ in. It weighs $6\frac{1}{2}$ pounds.

ASSOCIATION NEWS



RMA to Establish Central Patent Bureau

An important step toward solution of the patent troubles in the radio industry has been taken by the Radio Manufacturers' Association. Establishment of a central patent bureau to collect and disseminate complete information on radio patents was ordered by the RMA Board of Directors at their mid-summer meeting at Niagara Falls, Ontario. The new patent department will be in the New York offices in charge of a competent radio patent attorney.

An extensive library on radio patents, foreign as well as domestic, will be developed in the RMA patent department. It will collect, digest and index all radio patents and publications and all information regarding patent litigation. Files of many important manufacturers who are members of the RMA will be centralized in the RMA patent department, which will advise manufacturing members of radio suits and decisions, applications for and issuance of radio patents. The new patent department will not participate in any patent litigation, but its patent data will be available to all members.

In addition to the new patent department, the RMA directors also made organization plans for development of other industry services. President Morris Metcalf of Springfield, Massachusetts, presided at the meeting and continued the organization of various groups of manufacturers to deal with their special interests. The following chairmen of the various manufacturing groups were appointed:

Receivers, Captain William Sparks of Jackson, Michigan;

Tubes, B. G. Erskine of Emporium, Pennsylvania;

Speakers, Henry C. Forster of Chicago, Illinois;

Cabinets, N. P. Bloom of Louisville, Kentucky;

Amplifiers, A. C. Kleckner of Racine, Wisconsin;

Raw Materials, R. T. Pierson of New York;

Miscellaneous Parts, Lloyd Hammerlund of New York.

H. B. Richmond of Cambridge, Massachusetts, former president of the RMA, was appointed director of the Association's Engineering Division, which has plans for extensive work, especially in connection with interference problems. Mr. Richmond succeeds Mr. Walter E. Holland of Philadelphia. Ray H. Manson of Rochester, New York, will again head the Standards Section of the Engineering Division. Membership in the American Standards Association is to be taken by the RMA.

Plans for development of radio export trade were outlined by the newly appointed chairman of the Foreign Trade Committee, Mr. Arthur Moss of New York. More complete and recent export data will be distributed to RMA members.

In further reorganization of the RMA work during the coming year, President Metcalf appointed Harry M. Beach of Rochester, New York, as chairman of the Association's Merchandising Committee, and Major H. H. Frost of New York as chairman of the RMA Show Committee, having

jurisdiction over the policies and operations of the annual RMA Trade Show and public shows.

Reports on the recent successful trade show at Atlantic City and the annual RMA banquet were presented, respectively, by G. Clayton Irwin, Jr., of New York, Trade Show manager, and B. G. Erskine of Emporium, Pennsylvania, Convention and Banquet Committee chairman.

George C. Furness of New York, chairman of the Association's Statistics Committee, outlined plans to expand the industry's statistics reports, which are distributed monthly to association members. These statistics will be handled in the future by the Standard Statistics Company of New York.

J. Clarke Coit of Chicago, chairman of the RMA Traffic Committee, also reported on steps being taken to secure further freight rate reductions on various radio products.

A report on pending copyright and other radio legislation in Congress was made by Frank D. Scott, Washington legislative counsel for the RMA. Mr. Scott also reported that the Cuban Parcel Post Treaty had been completed under which radio parcel post shipment may be resumed to Cuba.

Filing of law suits to test the constitutionality of the new South Carolina tax on radio receiving sets was reported by John W. Van Allen of Buffalo, general counsel of the RMA.

Treasurer E. N. Rauland of Chicago presented and the Board of Directors approved a substantial budget for carrying on various association activities during the coming year, and the board also voted to continue the present schedule of membership dues. Under an amendment to the RMA constitution, approved at the Atlantic City convention, providing for associate membership, the board reclassified its active and associate members as recommended by Chairman Bloom of the Membership Committee. Resolutions deploring the recent death of Mr. Ernest R. Reichmann, former association counsel, were adopted by the Board of Directors.

Test Suits Against Radio Tax

THE Radio Manufacturers Association is responsible for the filing of three law suits opposing the South Carolina tax on radio receiving sets in the Federal District Court at Charleston. The suits are filed in the name of WBT, of an individual owner of a receiving set, and of a local distributor. They ask for an injunction on the collection of the tax, contending that the communication of radio programs from the broadcaster to the receiver is interstate commerce, which is not subject to state or local taxation. A temporary restraining order was issued by Judge Ernest F. Cochran, after the first hearing.



National Radio Week

NATIONAL Radio Week, September 22 to 28, is to be observed throughout the country by means of special broadcasts, cooperative radio sections in newspapers, bonfires of obsolete sets, selection of "radio queens," billboard displays and magazine advertising, all stressing the fact that "The Modern Home Demands a Modern Radio." The time is coincident with that of the Radio World's Fair in New York City and is sponsored by the Radio Manufacturers Association, the Radio Wholesalers Association, the National Federation of Radio Associations, and local trade associations at Omaha, Milwaukee, St. Louis, San Francisco, Seattle, and other cities whose trade associations are members of the N. F. R. A. The Executive Committee in charge of the event consist of J. Newcomb Blackman, Harry Alter and H. G. Erstrom, representing the N. F. R. A., and Herb. Frost, Bond Geddes and Maurice Metcalf representing the R. M. A.

Radio Wholesalers' Association

A BOOKLET of standards for Radio Advertising is being distributed by the Association. The Set Committee is seeking the cooperation of local trade associations and wholesalers in securing observance of the recommendations. A newly created associate membership enables finance companies to join the association and participate in discussions at conventions.

Standards for Radio Advertising

THE National Federation of Radio Associations and the Radio Wholesalers Association has published an eight-page pamphlet containing thirty-one specific recommendations to be followed in advertising radio sets. Eleven of these are definitions of what constitutes a "battery-operated," a "socket-powered," "electrified," "electric," "a-c tube electric," "d-c electric," "screen-grid," or "one adjustment radio receiver," and "magnetic," "electro-dynamic," or "inductor dynamic" loudspeaker. The other recommendations are briefly summarized as follows:

When sets are advertised as "complete" at a designated price, there should be no additional expense to the purchaser, such as installation or interest charge. When the price of tubes is not included it should be clearly stated. If the advertised number of tubes includes rectifiers it should be clearly specified. Discontinued models should be described as such and all sets should be identified by the maker's model number or year. They should be advertised as "former price" or "original price" and not as "regular price."

Claims for distance and selectivity should be based on average performance. Superlative claims and unrestricted statements should be avoided. It is considered inaccurate to advertise a device as a "static eliminator."

Used sets should be advertised as such. Advertisements of allowances on old sets should be clear as to whether they apply on all sets sold in the store. "Bait" advertising is considered unethical and if only a

limited quantity is available the fact should be clearly stated. Illustrations and layout should not convey a false impression.

Guarantees should be clearly defined and adhered to. "Free Trial" should imply no cost or obligation to the customer. Cabinet woods should be truthfully named.

The advertised "down payment" should assure delivery ready to operate. The phrase "no money down" should be literally true and "no interest charge" should mean that cash and credit prices are identical. A competitor's merchandise should not be disparaged.

Audiola Distributors

Audiola Radio Co. of Chicago, through C. W. Strawn, sales manager, announces appointment of the following distributors: Alabama—Birmingham, Alabama Elec. Supply Co.

California—San Francisco, Robert Weinstock, Inc.

Colorado—Denver, Kindel Bedding & Furniture Co.

Connecticut—Stamford, H. S. Helander Auto Sup. Co.

Florida—Fort Pierce, The Stanton Co.; Miami, Electrical Equipment Co.

Illinois—Bloomington, Alverson Sales Co.; Chicago, Amber Elec. Supply Co., Chicago Radio Apparatus, Inc., Steiner Electric Co.; Peoria, Nailon Bros. Co.

Indiana—Indianapolis and South Bend, The Gibson Company.

Iowa—Davenport, Republic Electric Co.

Kentucky—Ashland, Portsmouth Auto Supply Co.; Louisville, Louisville Tin & Stove Co.; Newport, Northern Ky. Radio Sales.

Maine—Bangor and Portland, James Bailey Co.

Maryland—Baltimore, Girard Phonograph Co.

Massachusetts—Boston, John V. Wilson Co.

Michigan—Detroit, E. A. Bowman, Inc.; Grand Rapids, Brown & Sehler Co.; Kalamazoo, The Gibson Company.

Minnesota—Duluth, Minneapolis and St. Paul, The Belmont Corp.

Missouri—Kansas City, Central States Electric Co.; St. Louis, Lindeman-Hoffer, Inc.

Nebraska—Omaha, Electric Maintenance Co. New Hampshire—Manchester, James Bailey Co., John V. Wilson Co.

New Jersey—Newark, Maurice S. Despres.

New York—Binghamton, Southern N. Y. Elec. Sup. Co.; Buffalo, Pyramid Supply Co.; Elmira, Southern N. Y. Elec. Sup. Co.; Jamestown, Holmes & Volz, Inc.; New York City, Maurice S. Despres; Plattsburg, M. P. Myers & Co.; Poughkeepsie, Morosco Distributing Co.; Rochester, Alliance Motor Corp.

Ohio—Cincinnati, Tovan Electric Co.; Cleveland, Mau Sherwood Supply Co.; Columbus, Loeb Electric Co.; Ironton, Portsmouth Auto Supply Co.; Lima, The Gibson Company; Portsmouth, Portsmouth Auto Supply Co.; Youngstown, The Electric Equipment Co.

Oklahoma—Oklahoma City, Southern Sales Co.

Pennsylvania—Erie, Holmes & Volz, Inc.; Harrisburg, Girard Phonograph Co.; Newcastle, Pennsylvania Radio Mfg. Co.; Philadelphia, Girard Phonograph Co.; Pittsburg, Allied Elec. Supply Co.; Reading, Girard Phonograph Co.; Wilkes-Barre, Valley Utilities.

Rhode Island—Providence, Belcher & Loomis Hdwe. Co.

Tennessee—Chattanooga, James Supply Co. Utah—Salt Lake City, Salt Lake Hardware Co.

Virginia—Lynchburg, Barker Jennings Hdwe. Co.

Wisconsin—Milwaukee, Phillip Gross Hdwe. & Sup. Co.

District of Columbia—Washington, Girard Phonograph Co.

PERSONAL MENTION

George K. Throckmorton, executive vice-president of E. T. Cunningham, Inc., has been elected a director of the Radio Manufacturers Association.

J. G. Hawthorne, formerly representative of the Sonora Phonograph Co., has succeeded George C. Lane as Southern California representative of the American Bosch Magneto Corp. radio division. Mr. Lane is with Collins-Lane, Ltd., as Bosch distributor at Los Angeles.

James C. Pope, Jr., of Minneapolis, has been appointed representative of the Polymet Manufacturing Corp. for Minnesota, North and South Dakota.

Hermann Star, vice-president of Warner Bros. Pictures and president of First National Pictures, has been elected a director of the De Forest Radio Co.

D. W. Walker has been made sales manager for A. H. Grebe Co., Inc., and George P. Rhodes is now advertising manager as well as sales promotion manager.

Clyde Tracey, formerly associated with National Union Radio Corp., now has charge of sales for the Gold Seal Electrical Co., makers of Gold Seal tubes.

E. A. Tracey, first vice-president National Union Radio Corporation, recently investigated several Pacific Coast cities as possible locations for the establishment of another tube making plant, the company now having three in the New York area and one in Chicago in addition to its western warehouses.

Newton Norman has been appointed eastern representative for the Ken-Rad Corporation of Owensboro, Ky., by Sales Manager R. E. Smiley. This territory includes eastern Pennsylvania, lower New Jersey, Delaware, Maryland and the District of Columbia.

J. F. Church, formerly manager of the radio division of the Kodak Electric and Manufacturing Co., is now with the Jensen Manufacturing Co. at Chicago.

Harry Sadenwater, formerly engineer in charge of WGY, is now sales engineer with the RCA-Victor Co. at Camden, New Jersey.

R. M. Peters, formerly assistant sales manager at Chicago for the American Bosch Magneto Corporation, has become sales manager, succeeding Herbert Shoemaker who has bought the Automotive Electrical Supply Co. of Memphis, Tenn.

A. G. Linsig, sales manager for Brunswick Radio Corporation at Buenos Aires, Argentine, under the direction of Z. E. Salisbury, general manager of the South American Foreign Division.

Paul C. Staake, formerly director of advertising and publicity for De Forest Radio Co. has become advertising manager for the National Union Radio Corp. of New York City.

NEW RADIO CATALOGS

Arcturus Radio Tube Co., Newark, N. J., in "The Photolytic Cell" presents a simple explanation of the theory and application of photo-electricity. Practical circuits are given for constructing several simple working models.

A new brochure on Grebe Radio, from A. H. Grebe and Company, Richmond Hill, N. Y., makes a striking presentation of the new models which use the SK4 and new AH1 chassis. The arguments in the text and the attractiveness of the illustrations will help the dealer who sells this line.

The Capehart Corporation of Fort Wayne, Indiana, manufacturers of the Capehart Orchestrope and Amperion, automatic phonographs and phonograph-radio combinations, is publishing a monthly list of records for use in their instruments.

Ohmite Manufacturing Company, Chicago, has issued a 16-page catalog, 8½ by 11 inches, of vitreous enameled resistance units whose ratings range from 5 to 240 watts. Useful data and curves are included for the use of the engineer and designer.

International Resistance Co., 2006 Chestnut Street, Philadelphia, has issued a "Resistor Replacement Guide" which gives the resistor requirements of various standard radio sets for several years past. It is supplied in loose leaf form with binder for fifty cents, which includes subsequent sheets to be issued.

"The Electric Voice" is a booklet about centralized radio and public address systems issued by the Radio Receptor Co. of New York City. It illustrates and describes the general application of such equipment in schools, hospitals, trains, shipboard, stadium, apartment houses, churches and the like. Technical specifications and prices of necessary accessories are shown in Bulletin 1032, a separate publication.

Vol. 1, No. 1 of "Full Range" comes from the Merchandise Department of General Electric Co. as the first of a series of selling aids for dealers who sell General Electric radio, which has "a full range of selectivity, sensitivity and reproduction," and for whose merchandizing the dealer has "a full range of support."

General Radio Co., Cambridge A, Mass., are distributing a circular on the Type 404 test-signal generator for use in neutralizing and aligning receivers and comparing their performance.

Best Manufacturing Co., Irvington, New Jersey, has issued circulars on various models of dynamic speakers and pick-ups for theater and other uses.

"Condenser Masterpieces" is the title of an 8-page bulletin from Dubilier Condenser Corporation, New York City. It illustrates, describes and prices many types of socket power condensers, as well as those used for transmitting, by-pass, and interference elimination.

"Kellogg Industrial Apparatus" from the Kellogg Switchboard & Supply Co. of Chicago, is a loose-leaf catalog of equipment to be used by radio manufacturers and broadcast stations. It includes keys, jacks, paper condensers, a-c tubes, microphones, coils, low-voltage lamps and wiring accessories.

Determinants of Radio Design

(Continued from Page 34)

with the fact that a radio manufacturer need not have a vast organization in order to be stable. The reason for this is reflected directly from the first paragraphs of this article—namely, that almost without exception every radio manufacturer depends upon outside sources for his major parts. Thus it is not at all uncommon to find a relatively small receiver manufacturer building a product composed of parts identical in their manufacture with those used by the largest producers. Nor will the receiving set manufactured by the small producer have any less design merit than the product of the large manufacturer. This is largely the result of the laboratory service which is incident to the undertaking of an agreement with any of the large patent licensors such as the Radio Corporation of America, Radio Frequency Laboratories, Hazeltine Laboratories, Inc., and other major contributors to the art of receiver design.

Not infrequently the receiver manufacturer whose output is small finds himself in this position merely because of

lack of distributing facilities or working capital, whereas his laboratory staff and laboratory equipment are quite as competent and complete as those found in the industrial giants of radio. Hence the prospective purchaser need not be under the impression that his purchase will be excellent in proportion to the size of its producer.

What Will the Future Bring?

BECAUSE development is unceasing and because the life of the industry depends upon continued improvement, it is no wonder that the receiver of the future follows so closely at the heels of the receiver of today that there is hardly a line of demarcation.

Only a few months ago features were promised for the distant future and yet there have been shown at the recent trade shows the products of prominent manufacturers which embody these very features. Thus remote control, tone control, and the screen grid superheterodyne, subjects only for laboratory discus-

sion but a few months ago, are to be found on the leading makes of receivers.

It is human nature to wonder what the future will bring, but it is not human nature to be able to predict the future. The curve of development can nevertheless be extrapolated somewhat. Tone control, appearing now on only three or four makes of receivers, will undoubtedly become a standard feature because it embodies a thoroughly sound principle. Remote control, fascinating and wizardlike though it may be in its performance, promises to die an untimely death because of the advent of the midget receiving set, several of which may be installed for the price of a single centralized receiver with remote control stations.

It is not within the realm of this article to discuss speculative radical improvements or changes, but there can be no doubt that as time goes on, radio receivers will be cheaper to buy, more durable mechanically, more beautiful in their appearance, and more perfect in their performance.

"CHARGE IT"

(Continued from Page 48)

turned that it determines if the buyer is all he claims to be.

Make Your Own Authorization System

IT is not possible to present a cut and dried authorization system which will assist any business. Size and nature of the individual business extending credit vitally relates to the efficient authorization routine.

This routine is made up of files, limits and rules for employees. All these should be based on the individual store's operation conditions.

The objective which is reached should be a condition under which customers, buying on a charge-take basis, get their goods immediately, and if the fact there has been an authorization detail attended to is not apparent, so much the better. Also, the routine should be rapid.

It is a fact that, in some stores using the charge-phone system, the average time consumed on authorization for hours at a time is less than twenty-five seconds! It seems incredible, but it is true.

In arriving at a rapid routine, the factor of safety must not be forgotten for a moment. It is, indeed, out of regard for safety that the whole authorization routine is set up.

PROFIT PROMOTION

(Continued from Page 28)

Yes, the production of maximum *profit* volume in the radio store calls for much more than maximum *sales* volume. It calls for *planned* action and *controlled* action; and always with a definite aim at the real target—PROFIT VOLUME.

Let us see to it that the three basic essentials in management—*planning, action, control*—are fixed in mind more firmly than ever before, and kept in mind more constantly than ever before.

This lesson will then have done its work. Our appreciation of the practical value in recognizing and understanding and applying *basic principles* will then grow surely and steadily, like a well-rooted and well-nourished tree. We will find ourselves more frequently making a practical test of this *bedrock* for our management.

The practical test is not, of course, a matter of exact measurement. It depends entirely upon our own individual judgment. We must "sense" for ourselves whether our planning and acting and controlling are sufficiently sound, and are working together as harmoniously as they should. Our *sensing ability* develops rapidly through the thoughtful and continued study of fundamentals. Remember that.

We may size up the situation and find, for example, that our action is much stronger in *proportion* than our planning and controlling. In that event—well, we progress through striving to improve.

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Editor's Note: The next lesson for Radio's Course in Profit Promotion will discuss why and how "Every Radio Dealer Can Build a Better Profit-Making Program." Be sure to save each lesson. You certainly will want to review every lesson from time to time as the course unfolds.

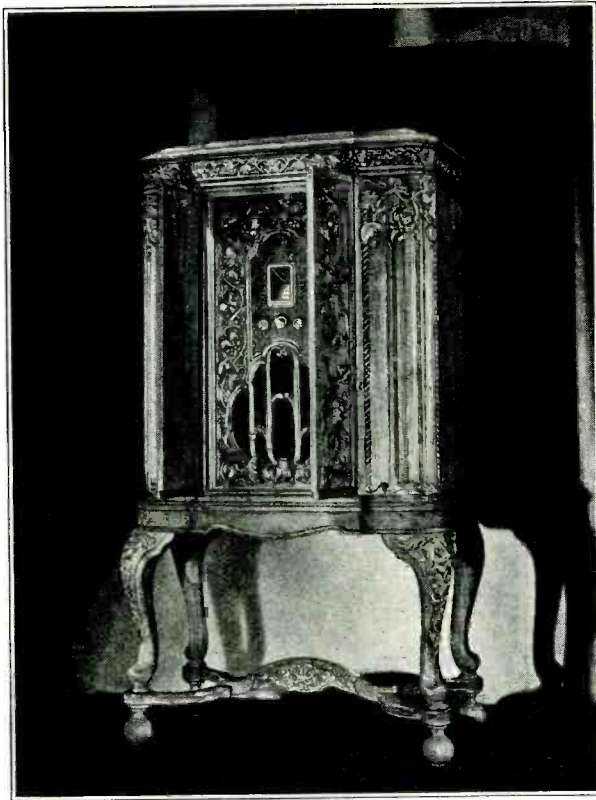
Unique Clarion Demonstrator

The McClendon Hardware Co. of Waco, Texas, demonstrates Clarion receivers by means of an auto bus which



Clarion Demonstration Room on Wheels

carries the salesmen, servicemen and several radios to the dealer's store. The salesman plugs in on an a-c line and gives an outdoor demonstration that soon attracts a big crowd.



Model 51, With Automatic Volume Control, \$317
 Other Models \$208 and \$248
 and up to \$1000
Prices quoted are without tubes

The highest
 note
 in radio
 achievement

THINGS HAPPEN OVERNIGHT IN RADIO

Circuit refinements are perfected—new patents are released—public demand changes.

Always alert, Story and Clark keeps abreast of the changing tides. Dealers who have continued their relations with Story and Clark over a period of three score years and ten have complete confidence that before a new trend is noticeable the new Story and Clark product is on hand to meet the demand.

The research and engineering work of months goes into the planning of production for the seasons ahead. Field men and engineers, marketing and advertising departments, are at work week after week determining the trend of public demand—checking, testing and experimenting with every circuit development—all to the end that Radio by Story and Clark may continue to be "The Highest Note In Radio Achievement."

Such foresight, such planning are the dealer's guarantee of freedom from obsolete merchandise, surprise changes, and other stratagems that threaten his good business standing and continued prosperity.

Built Complete in the Story & Clark Factories

THE STORY & CLARK RADIO CORPORATION
 173 N. Michigan Avenue, Chicago

* *

*Manufactured under STORY & CLARK owned Patents
 and Patents Pending*

Licensed under R. C. A. and Affiliated Companies,
 Charter Member R. M. A.

RADIO

by STORY & CLARK



Who Makes It

Classified Index of Radio Equipment and Its Manufacturers

Corrected Monthly

Key to Letters and Numbers

- A-1 The Abox Co., 215 N. Michigan Ave., Chicago, Ill.
 A-2 Accusti-Cone Laboratories, 1 N. Seventh, Philadelphia, Pa.
 A-3 The A-C Dayton Co., 300 E. First St., Dayton, Ohio.
 A-4 Acme Apparatus Corp., 37 Osborn St., Cambridge, Mass.
 A-5 The Acme Electric & Mfg. Co., 1444 Hamilton Ave., Cleveland, Ohio.
 A-6 Acme Products Co., 22 Elkins St., South Boston, Mass.
 A-7 The Acme Wire Co., New Haven, Conn.
 A-8 The Actron Corp., 123 N. Sangamon St., Chicago, Ill.
 A-9 Adler Mfg. Co., 29th and Chestnut Sts., Louisville, Ky.
 A-10 Adrola Corp., Fort Jefferson, N. Y.
 A-11 Advance Electric Co., 1260 W. 2nd St., Los Angeles, Calif.
 A-12 Aerial Insulator Co., Inc., 429 N. Washington St., Green Bay, Wis.
 A-13 Aero Products, Inc., 4611 E. Ravenswood Ave., Chicago, Ill.
 A-14 Aerovox Wireless Corp., 70 Washington St., Brooklyn, N. Y.
 A-15 Ajax Electric Specialty Co., 1926 Chestnut St., St. Louis, Mo.
 A-16 Akron Porcelain Co., Akron, Ohio.
 A-17 Alden Mfg. Co., Brockton, Mass.
 A-18 Aladdin Mfg. Co., 602 E. 18th St., Muncie, Ind.
 A-19 All-American Mohawk Corp., 4201 Belmont Ave., Chicago, Ill.
 A-20 Allan Mfg. & Electrical Corp., 529 Broadway, N. Y. C.
 A-21 Allen-Bradley Co., 494 Reed St., Milwaukee, Wis.
 A-22 Allen-Hough-Carryola Co., 279 Walker St., Milwaukee, Wis.
 A-23 Alpha Wire Corp., 520 Broadway, N. Y. C.
 A-24 Aluminum Co. of America, 2400 Oliver Bldg., Pittsburgh, Pa.
 A-25 American Apparatus Co., Richmond, Ind.
 A-26 American Battery Corp., 2053 N. Racine Ave., Chicago, Ill.
 A-27 American Bosch Magneto Corp., Springfield, Mass.
 A-28 American Electric Co., 64th and State St., Chicago, Ill.
 A-29 American Hard Rubber Co., 11 Mercer St., N. Y. C.
 A-30 American Lava Corp., 29 William St., Chattanooga, Tenn.
 A-31 American Piezo Supply Co., 1101 Huron Bldg., Kansas City, Mo.
 A-32 American Porcelain Co., Akron, Ohio.
 A-33 American Radio Hardware Co., 135 Grand, N. Y. C.
 A-34 American Reproducer Corp., 1200 Summit St., Jersey City, N. J.
 A-35 American Storage Battery Co., 128 Dartmouth, Boston, Mass.
 A-36 American Transformer Co., 178 Emmet St., Newark, N. J.
 A-37 Amoroso Mfg. Co., 60 India St., Boston, Mass.
 A-38 Amperite Corp., 561 Broadway, N. Y. C.
 A-39 Amplex Instrument Labs., 132 W. 21st St., N. Y. C.
 A-40 Ampilon Corp. of America, 133 W. 21st St., N. Y. C.
 A-41 The Amrad Corp., 205 College Ave., Medford, Mass.
 A-42 Anaconda Wire & Cable Co., 111 W. Washington St., Chicago, Ill.
 A-43 F. A. D. Andrea, Inc., Jackson, Orchard and Queen Sts., Long Island City, N. Y.
 A-44 Anylite Electric Co., Fort Wayne, Ind.
 A-45 Arc-Aerial, Inc., Green Bay, Wis.
 A-46 Arco Electrical Corp., 207 E. Columbia St., Fort Wayne, Ind.
 A-47 Arcturus Radio Tube Co., 260 Sherman Ave., Newark, N. J.
 A-48 Argon Tube Corp., 102 Livingston, Newark, N. J.
 A-49 Armstrong Electric Co., 187 Sylvan Ave., Newark, N. J.
 A-50 Armstrong & White, 9th and Liberty Ave., Pittsburgh, Pa.
 A-51 Arnold Electric Co., Racine, Wis.
 A-52 Aston Cabinet Mfrs., 1223 W. Lake St., Chicago, Ill.
 A-53 Atlantic Electric Lamp Co., Salem, Mass.

- A-54 Atlas Radio Corp., Peabody, Mass.
 A-55 Atwater-Kent Mfg. Co., 4700 Wissahickon Ave., Philadelphia, Pa.
 A-56 Auburn Button Wks., Inc., Auburn, N. Y.
 A-57 Audak Co., 565 Fifth Ave., N. Y. C.
 A-58 Audiola Radio Corp., 430 S. Green, Chicago, Ill.
 A-59 The D. L. Auld Co., 5th Ave. and 5th St., Columbus, Ohio.
 A-60 Automatic Radio Mfg. Co., 112 Canal St., Boston, Mass.
 A-61 Automobile Radio Corp., 1475 E. Grand Blvd., Detroit, Mich.
 B-1 Bailey-Cole Electrical Co., 1341 Flatbush Ave., Brooklyn, N. Y.
 B-2 Baldor Radio Corp., 80 4th Ave., N. Y. C.
 B-3 Nathaniel Baldwin, Inc., 3474 S. 23rd St., E., Salt Lake City, Utah.
 B-4 Balkeit Radio Co., North Chicago, Ill.
 B-5 Baritone Mfg. Co., 844 W. Jackson, Chicago, Ill.
 B-6 Barkelew Electric Mfg. Co., Middletown, Ohio.
 B-7 The Wallace Barnes Co., Box 506, Bristol, Conn.
 B-8 Barrett Mfg. Co., 3712 San Pablo Ave., Oakland, Calif.
 B-9 Bassett Metal Goods Co., Derby, Conn.
 B-10 Bastian Bros. Co., 1600 Clinton Ave., N., Rochester, N. Y.
 B-11 Batteryless Radio Corp., 116 W. 65th St., N. Y. C.
 B-12 Beaver Mfg. Co., 625 N. 3rd St., Newark, N. J.
 B-12a Beede Electrical Instrument Co., Penacook, N. H.
 B-13 Belden Mfg. Co., 2300 S. Western Ave., Chicago, Ill.
 B-14 Benjamin Electric Mfg. Co., Des Plaines, Ill.
 B-16 Bernard Electrical Mfg. Co., 36 Flatbush Ave., Brooklyn, N. Y.
 B-17 Best Mfg. Co., 1200 Grove St., Irvington, N. J.
 B-18 Bethesda Crystal Lab., Bethesda, Md.
 B-19 Birnbach Radio Co., 254 W. 31st St., N. Y. C.
 B-20 Bisby Mfg. Co., 59 Warren, N. Y. C.
 B-20a B-L Electric Co., St. Louis, Mo.
 B-21 Bodine Electric Co., 2254 W. Ohio St., Chicago, Ill.
 B-22 Bond Electric Corp., Jersey City, N. J.
 B-23 Borden Electric Co., 480 Broad, Newark, N. J.
 B-24 Bosworth Electric Mfg. Co., Main and Lexington Ave., Norwood, Cincinnati, Ohio.
 B-25 Boudette Mfg. Co., 67 Crescent Ave., Chelsea, Mass.
 B-26 L. S. Brach Mfg. Corp., 55 Dickerson St., Newark, N. J.
 B-27 Braun Co., W. C., 551 Randolph, Chicago, Ill.
 B-28 Bremer-Tully Mfg. Co., 656 Washington Blvd., Chicago, Ill.
 B-29 Bright Star Battery Co., Hoboken, N. J.
 B-30 Broadcaster's Service Bureau, San Jose, Calif.
 B-31 Brooklyn Metal Stamping Corp., 718 Atlantic Ave., Brooklyn, N. Y.
 B-32 Browne & Caine, Inc., 2317 Calumet Ave., Chicago, Ill.
 B-33 Browning-Drake Corp., Calvary St., Waltham, Mass.
 B-34 Brunswick-Balke-Collender Co., 623 S. Wabash Ave., Chicago, Ill.
 B-35 Buckeye Electric Mfrs., Gladwin, Mich.
 B-36 The Buckingham Radio Corp., 440 W. Superior St., Chicago, Ill.
 B-37 Bud Radio, Inc., 2744 Cedar, Cleveland, Ohio.
 B-38 Burgess Battery Co., Harris Trust Bldg., Chicago, Ill.
 B-39 Bush & Lane Piano Co., Holland, Mich.
 C-1 Cable Radio Tube Corp., 84 N. Ninth St., Brooklyn, N. Y.
 C-2 Candy & Co., Inc., 2515 W. 35th St., Chicago, Ill.
 C-3 Cannon & Miller Co., Inc., Springwater, N. Y.
 C-4 The Capehart Corp., Fort Wayne, Ind.
 C-5 Carborundum Co., Niagara Falls, N. Y.
 C-6 Cardwell Mfg. Corp., 81 Prospect St., Brooklyn, N. Y.
 C-7 Carter Radio Co., 407 S. Aberdeen St., Chicago, Ill.
 C-8 Cary Cabinet Corp., 1427 N. 15th St., St. Louis, Mo.
 C-9 The Caswell-Runyan Co., Huntington, Ind.
 C-10 CeCo Mfg. Co., Inc., 702 Eddy St., Providence, R. I.
 C-11 Central Radio Corp., Beloit, Wis.
 C-12 Central Radio Labs., 16 Keefe Ave., Milwaukee, Wis.
 C-13 Champion Radio Works, Inc., 140 Pine St., Danvers, Mass.

Items

- ADAPTERS, Tube**
 A-17, C-7, C-39, F-22, G-12, I-5, L-12, M-5, P-1, R-13, R-22, S-26, W-24.
- AERIAL EQUIPMENT, Leads, Lightning Arresters, Loops, Mastarms, Plugs, Poles**
 A-15, A-33, A-37, A-45, A-50, B-9, B-13, B-20, B-21, B-26, B-37, C-16, C-17, C-36, D-15, D-16, E-1, E-23, F-12, F-15, G-1, G-12, G-26, G-31, H-11, H-18, I-5, L-11, M-18, M-23, N-5, P-7, S-13, S-17, S-26, S-47, T-20, T-21, U-6, W-13, W-21, Y-1.
- AERIAL INSULATORS**
 A-12, A-15, A-16, A-29, A-30, A-32, A-50, B-6, B-26, C-32, C-35, F-14, F-16, G-12, H-6, H-11, I-4, I-5, J-4, K-15, L-11, M-11, P-7, P-18, P-24, R-11, S-26, S-31, T-18, U-4, U-5, W-21.
- ALUMINUM SHEET, ROD & TUBE**
 A-24.
- AMPLIFIERS, Audio**
 A-1, A-17, A-46, A-60, B-8, C-21, E-8, F-4, F-7, G-8, G-18, G-24, K-3, L-12, M-4, M-19, N-3, O-4, O-5, P-1, P-12, P-21, R-3, R-14, R-20, S-1, S-18, S-19, S-25, S-35, T-10, W-8.
- BATTERIES, Dry**
 B-1, B-22, B-29, B-38, D-8, F-20, G-4, N-2, S-20, S-41.
- BATTERIES, Storage**
 A-26, B-35, E-14, G-9, G-19, G-23, P-6, S-20, S-41, U-13, W-15.
- BATTERY CHARGERS**
 A-19, A-26, A-46, B-20a, C-21, D-1, E-12, E-13, E-18, G-6, G-20, K-4, K-17, P-6, S-3, S-24, T-12, T-15, U-15, W-2, W-11, W-27.
- BATTERY CHARGING RELAYS**
 A-19, A-46, C-24, C-25, F-17, H-6, H-11, L-4, R-24, T-7, U-5, W-2, Y-2.
- BATTERY ELIMINATORS (For Plate Current Supply)**
 A-19, A-25, A-35, A-45, B-16, B-22, C-18, C-39, D-6, E-10, E-18, F-4, F-17, F-18, G-7, G-8, G-27, K-4, K-14, K-17, M-17, N-3, P-1, P-6, P-12, P-20, P-21, P-23, S-18, S-20, S-24, S-39, T-12, T-16, W-7, W-15.
- BATTERY POWER UNITS (Combination)**
 A-35, A-46, C-33, D-1, D-14, E-12, F-17, G-8, G-23, G-29, H-7, K-4, K-12, P-6, R-8, S-9, S-20, S-24, T-13, V-3, W-15, W-27.
- BINDING POSTS**
 A-2, A-15, A-24, A-56, B-7, C-17, E-5, E-10, F-1, F-8, G-12, G-18, I-5, K-6, P-7, P-12, P-15, R-19, S-26, W-5, X-1.
- BRACKETS, Sub-Panel**
 A-13, B-14, E-8, E-10, F-22, I-5, K-3, P-12, S-18, S-25.
- BROADCASTING EQUIPMENT**
 B-8, B-30, E-15, E-19, F-7, F-22, G-6, G-12, G-25, H-12, I-3, K-5, L-3, R-9, R-17, S-1, S-20, T-10, W-11.
- CABINETS**
 A-9, A-52, A-59, B-34, B-36, B-39, C-8, C-9, C-15, C-26, D-2, E-4, E-21, E-24, E-25, F-6, F-10, F-19, G-30, H-2, H-21, K-16, L-8, L-9, M-12, N-3, P-11, P-14, P-17, R-5, R-6, R-12, R-23, S-15, S-22, S-30, S-34, S-37, S-38, S-43, U-1, W-4, W-6, W-16.

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**LIFE-LIKE REPRODUCTION
ACCOMPLISHED BY A
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THE HYDRO POSITIVE MAGNETIC PICKUP differs from others in that an improved design has been perfected for the pole pieces, armature and suspension, and in the magnetic circuit. This new type of armature has only one resonance period, resulting in vastly improved reproducing qualities. One demonstration will convince you of its superiority. The use of two very small rubber bearings further results in added tonal brilliance. There are three models of the new HYDRO POSITIVE MAGNETIC PICKUP. One is for ordinary phonograph use—another for talking pictures, and another for broadcasting stations and engineering laboratories. Other pickups for special work are also available. Those who are in the market for a better pickup will benefit by writing us today for further information.

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822 Merchants Road
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UNIT REPRODUCER CO., 822 Merchants Road, Rochester, N. Y. Tell me more about the HYDRO POSITIVE Pickups, as advertised in September RADIO. Name
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Tell them you saw it in RADIO

- C-14 Chicago Transformer Corp., 4541 Ravenswood Ave., Chicago, Ill.
- C-15 Chillicothe Furniture Co., 1 Cherry St., Chillicothe, Mo.
- C-16 Circle F Mfg. Co., Trenton, N. J.
- C-17 Clarostat Mfg. Co., Inc., 285 N. Sixth St., Brooklyn, N. Y.
- C-18 Cole Sales Co., 36 Pearl, Hartford, Conn.
- C-19 Colonial Radio Corp., 25 Wilbur Ave., Long Island City, N. Y.
- C-20 Columbia Phonograph Co., Inc., 1819 Broadway, N. Y. C.
- C-21 Columbia Radio Corp., 711 W. Lake St., Chicago, Ill.
- C-22 Concourse Elec. Co., 294 E. 137th St., N. Y. C.
- C-23 Condenser Corp. of America, 259 Cornelison Ave., Jersey City, N. J.
- C-24 Connecticut Electric Mfg. Co., Bridgeport, Conn.
- C-25 Connecticut Telephone & Electric Co., Meriden, Conn.
- C-26 The Conner Furniture Co., 5th and Oak Sts., New Albany, Ind.
- C-27 Consolidated Elec. Lamp Co., 88 Holten, Danvers, Mass.
- C-28 Consolidated Vacuum Tube Corp., 22 East 21st St., N. Y. C.
- C-29 Continental-Diamond Fibre Co., 1150 W. 3rd St., Cleveland, Ohio.
- C-30 Continental Electric & Mfg. Co., 1890 E. Fortieth, Cleveland, Ohio.
- C-31 Continental Radio Corp., Fort Wayne, Ind.
- C-32 Cook Porcelain Ins. Corp., Cambridge, Ohio.
- C-33 Cooper Corp., 8th and Main Sts., Cincinnati, Ohio.
- C-34 Cornell Elec. Mfg. Co., Rawson St. and Anable Ave., Long Island City, N. Y.
- C-35 Corning Glass Works, Corning, N. Y.
- C-36 Cornish Wire Co., Inc., 30 Church St., N. Y. C.
- C-37 Crescent Braid Co., Providence, R. I.
- C-38 Cresradio Corp., 166 Jamaica Ave., Jamaica, N. Y.
- C-39 Crosley Radio Corp., 3401 Colerain Ave., Cincinnati, Ohio.
- C-40 Crouse-Hind Co., Syracuse, N. Y.
- C-41 Crowe Name Plate & Mfg. Co., 1749 Grace St., Chicago, Ill.
- C-42 E. T. Cunningham, Inc., 370 Seventh Ave., N. Y. C.
- C-43 The Cutler-Hammer Mfg. Co., 12th and St. Paul Ave., Milwaukee, Wis.
- D-1 D. A. Radio Co., 30 Hollister St., Buffalo, N. Y.
- D-1a The Daven Co., 160 Summit St., Newark, N. J.
- D-2 Davis Industries, Inc., 314 W. 43rd St., Chicago, Ill.
- D-3 Day-Fan Electric Co., 1320 Wisconsin Blvd., Dayton, Ohio.
- D-4 DeForest Radio Co., Central and Franklin Sts., Jersey City, N. J.
- D-5 DeJur-Amsco Corp., 418 Broome St., N. Y. C.
- D-6 Demco Products Co., 1521 Market St., Wheeling, W. Va.
- D-7 Diamond Appliance Co., South Bend, Ind.
- D-8 Diamond Electric Corp., 780 Frelinghuysen Ave., Newark, N. J.
- D-9 Diamond Vacuum Products Co., 4049 Diversey Ave., Chicago, Ill.
- D-10 Diehl Mfg. Co., Elizabethport, N. J.
- D-11 Dilco Electric Corp., Harrison, N. J.
- D-12 Dongan Electric Mfg. Co., 3001 Franklin St., Detroit, Mich.
- D-13 Donle-Bristol Corp., Meriden, Conn.
- D-14 Dooley Rectifier Co., Wheeling, W. Va.
- D-15 Dubilier Condenser Corp., 342 Madison Ave., N. Y. C.
- D-16 Dudlo Mfg. Co., Fort Wayne, Ind.
- D-17 Duovac Radio Tube Corp., 360 Furman, Brooklyn, N. Y.
- E-1 Eagle Electric Mfg. Co., 59 Hall St., Brooklyn, N. Y.
- E-2 Eastern Coil Co., 56 Christopher Ave., Brooklyn, N. Y.
- E-3 Easton Coil Co., Keplers, Ind.
- E-4 Ebert Furniture Co., Red Lion, Pa.
- E-5 The H. H. Eby Mfg. Co., Inc., 4710 Stenton Ave., Philadelphia, Pa.
- E-6 Thomas A. Edison, Inc., Orange, N. J.
- E-7 The Ekko Co., 111 W. Monroe St., Chicago, Ill.
- E-8 Electrad, Inc., 175 Varick St., N. Y. C.
- E-9 Electrical Products Mfg. Co., Providence, R. I.
- E-10 Electrical Research Labs., Inc., 1731 W. 22nd St., Chicago, Ill.
- E-11 Electrical Specialty Co., 211 South St., Stamford, Conn.
- E-12 Electric Autolite Co., Toledo, Ohio.
- E-13 Electric Heat Control Co., 5902 Carnegie Ave., Cleveland, Ohio.
- E-14 Electric Storage Battery Co., Philadelphia, Pa.
- E-15 Electro Acoustics Products Co., 55 E. Wacker Drive, Chicago, Ill.
- E-16 Electron Relay Co., 83 Fourth Ave., N. Y. C.
- E-17 Elgin Cabinet Corp., Union and W. Chicago Sts., Elgin, Ill.
- E-18 Elkon, Inc., 200 Fox Island Road, Port Chester, N. Y.
- E-19 Ellis Electrical Lab., 333 W. Madison St., Chicago, Ill.
- E-20 Emerson Radio & Phonograph Corp., 635 Sixth Ave., New York City.
- E-21 The Empire, Ltd., 11th and Harrison, Rockford, Ill.
- E-22 Empire Steel Corp., Mansfield, Ohio.
- E-23 Essenbee Radio Devices Co., 2016 W. Lake St., Chicago, Ill.
- E-24 Eureka Talking Machine Corp., 5939 S. Lowe Ave., Chicago, Ill.
- E-25 Excello Products Corp., 4820 W. 16th St., Cicero, Ill.
- F-1 Fahnestock Electric Co., East Ave. and 8th St., Long Island City, N. Y.
- F-2 Fairmont Elec. & Mfg. Co., 59th and Woodland Ave., Philadelphia, Pa.
- F-3 Fansteel Products Co., No. Chicago, Ill.
- F-4 Farrand Mfg. Co., Inc., Metropolitan Bldg., Long Island City, N. Y.
- F-5 John E. Fast & Co., 3982 Barry Ave., Chicago, Ill.
- F-6 Federal Wood Products Corp., 206 Lexington Ave., N. Y. C.
- F-7 Ferranti, Inc., 130 W. 42nd St., N. Y. C.
- F-8 Fibroc Insulation Co., Valparaiso, Ind.
- F-9 Fidelitty Radio Corp., Walker Bank Bldg., Salt Lake City, Utah.
- F-10 Robert Findlay Mfg. Co., Inc., 1027 Metropolitan Ave., Brooklyn, N. Y.
- F-11 Fisch Radio Co., 1283 Hoe Ave., N. Y. C.
- F-12 Fishwick Radio Co., 133 Central Parkway, Cincinnati, Ohio.
- F-13 A. M. Flechthelm & Co., Inc., 136 Liberty St., New York City.
- F-14 M. M. Fleron & Son, Trenton, N. J.
- F-15 Foote-Pierson & Co., 75 Hudson, Newark, N. J.
- F-16 The Formica Insulation Co., Cincinnati, Ohio.
- F-17 France Mfg. Co., 10325 Berea Rd., Cleveland, Ohio.
- F-18 Freed-Eisemann Radio Corp., Junius St. and Liberty Ave., Brooklyn, N. Y.
- F-19 Jesse French & Sons Piano Co., New Castle, Ind.
- F-20 French Battery Co., 30 N. Michigan Ave., Chicago, Ill.
- F-21 S. Freshman Co., 225 N. Michigan Ave., Chicago, Ill.
- F-22 Herbert H. Frost, Inc., 1124 W. Beardsley Ave., Elkhart, Ind.
- G-1 Gardiner & Hepburn, Philadelphia, Pa.
- G-2 Gardner Electric Mfg. Co., Oakland, Calif.
- G-3 Gearhart Radio Co., Fresno, Calif.
- G-4 General Coil Co., Weymouth, Mass.
- G-5 General Dry Batteries, Inc., 13100 Athens Ave., Cleveland, Ohio.
- G-6 General Electric Co., Schenectady, N. Y.
- G-7 General Engineering Corp., Charlotte, Mich.
- G-8 General Instrument Corp., 225 Varick St., N. Y. City.
- G-9 General Lead Battery Co., 1 Lister Ave., Newark, N. J.
- G-10 General Motors Radio Corp., Dayton, Ohio.
- G-11 General Plastics, Inc., Walck Road, North Tonawanda, N. Y.
- G-12 General Radio Co., 30 State St., Cambridge, Mass.
- G-13 General Transformer Corp., 910 W. Jackson Blvd., Chicago, Ill.
- G-14 Gibraltar Radio Supply Co., 5 Union Square, N. Y. C.
- G-15 Gilby Wire Co., 150 Riverside Ave., Newark, N. J.
- G-16 Gilfillan Radio Corp., 1815 Venice Blvd., Los Angeles, Calif.
- G-17 Gillette-Vibber Co., New London, Conn.
- G-18 Globe Technolean Corp., Reading, Mass.
- G-19 Globe Union Mfg. Co., 14 Keefe Ave., Milwaukee, Wis.
- G-20 Gold Seal Electrical Co., Inc., 250 Park Ave., N. Y. C.
- G-21 The L. S. Gordon Co., 1800 Montrose Ave., Chicago, Ill.
- G-22 Gossard Radio & Wire Co., Belvidere, Ill.
- G-23 Gould Storage Battery Co., 250 Park Ave., N. Y. C.
- G-24 Gray & Danielson Mfg. Co., 2101 Bryant St., San Francisco, Calif.
- G-25 Graybar Electric Co., Lexington Ave. and 43rd St., N. Y. C.
- G-26 Gray Products, Inc., Poughkeepsie, N. Y.
- G-27 A. H. Grebe & Co., Inc., 109 W. 57th St., N. Y. C.
- G-28 Frank Greben, 1927 So. Peoria St., Chicago, Ill.
- G-29 Grigsby-Grunow Co., 5891 W. Dickens Ave., Chicago, Ill.
- G-30 Gulbransen Co., 3232 W. Chicago Ave., Chicago, Ill.
- G-31 Gustin-Baker Mfg. Co., Kansas City, Mo.
- G-32 Guthrie Co., Elyria, Ohio.
- H-1 Halldorson Co., 4500 Ravenswood Ave., Chicago, Ill.
- H-2 Hamilton Mfg. Co., Two Rivers, Wis.
- H-3 Hammariund Mfg. Co., Inc., 424 W. 33rd St., N. Y. C.
- H-4 Hammond Clock Co., 2911 N. Western Ave., Chicago, Ill.
- H-4 Hardwick, Hindle, Inc., 215 Emmet St., Newark, N. J.
- H-5 Kenneth Harkness, Inc., 72 Cortlandt, N. Y. C.
- H-6 Hart & Hegemann, Hartford, Conn.
- H-7 Hartford Battery Mfg. Co., 47 W. 63rd St., N. Y. C.
- H-8 Hartford Metal Products Co., Hartford, Conn.
- H-9 Hartman Electrical Mfg. Co., 31 E. 5th St., Mansfield, Ohio.
- H-10 Harvey Hubbell Co., Bridgeport, Conn.
- H-11 Heinemann Electric Co., Trenton, N. J.
- H-12 Heintz & Kaufman, 311 California St., San Francisco, Calif.
- H-13 Herald Electric Co., 35 East End Ave., N. Y. C.
- H-14 Hickok Electrical Instrument Co., 10514 Dupont, Cleveland, Ohio.
- H-15 High Frequency Labs., 28 N. Sheldon St., Chicago, Ill.
- H-16 Hilet Engineering Co., Orange, N. J.
- H-17 The Holyoke Co., Inc., 621 Broadway, N. Y. C.
- H-18 Hope Webbing Co., Providence, R. I.
- H-19 Howard Radio Co., South Haven, Mich.
- H-20 Hoyt Electrical Instrument Works, 857 Boylston St., Boston, Mass.
- CABLE, CABLES AND CONNECTING WIRE**
A-7, A-23, A-42, B-13, B-19, B-26, C-21, C-36, C-37, D-16, E-1, G-15, G-22, H-17, I-2, I-5, K-5, N-12, P-2, P-7, P-16, R-33.
- CLAMPS, Ground**
A-50, B-7, B-13, B-23, B-26, C-17, C-24, C-40, E-1, E-7, F-1, F-2, F-22, G-17, H-6, H-11, I-5, M-18, M-20, M-23, R-31, T-8, Y-1.
- CLIPS**
A-15, A-17, B-7, F-1, K-17, L-12, M-18, M-20, M-23, N-3, W-5.
- COILS, A-F Choke**
A-4, A-5, A-7, A-46, C-7, C-14, C-22, D-12, D-16, E-3, E-18, F-7, F-17, G-3, G-5, G-8, G-12, G-13, G-24, H-1, J-2, K-11, M-23, N-3, P-12, P-16, P-23, P-25, P-25, R-3, R-25, R-27, S-5, S-18, T-16, W-8.
- COILS, R-F Choke**
A-4, A-13, C-22, D-16, E-3, E-10, F-17, G-4, G-12, G-24, H-3, H-5, K-3, M-12a, M-23, N-3, P-12, P-16, P-23, P-25, R-3, R-25, R-27, S-1, S-16, S-18, T-4.
- COILS, R-F**
A-4, A-6, A-13, B-14, B-19, B-21, B-28, B-35, C-11, C-21, C-22, E-2, E-3, E-10, F-17, G-3, G-12, G-24, H-3, H-5, K-3, K-11, M-4, M-12a, N-3, P-1, P-12, P-22, P-25, R-9, R-19, R-27, S-6, S-16, S-18, T-4, T-24, V-7.
- COIL WINDING MACHINES**
A-5, B-13, H-1, M-12a, M-18.
- CONDENSERS, Fixed Electrolytic**
A-14, A-41, C-23, C-39, D-15, E-18, I-1, M-9, P-16, P-19, P-23, S-27.
- CONDENSERS, Fixed Mica**
A-14, A-39, C-23, C-39, D-15, E-8, E-10, F-22, M-13, M-23, P-12, P-16, P-19, S-2, W-19, X-1.
- CONDENSERS, Fixed Paper**
A-7, A-14, B-32, C-22, C-23, C-34, C-36, D-15, E-8, E-3, F-7, F-13, G-12, I-3, K-5, K-17, L-12, M-13, M-23, P-12, P-16, P-19, P-21, R-4, S-27, T-12, W-19.
- CONDENSERS, Variable**
A-13, C-6, C-39, D-5, E-10, G-1, G-3, G-8, G-12, G-24, H-3, H-12, K-3, L-3, M-23, N-3, P-1, P-12, P-22, P-25, R-7, R-9, R-19, S-7, S-18, U-11.
- CONDENSER SHAFTS AND COUPLINGS**
H-3, N-3, P-12, P-22, S-7.
- CRYSTALS, Piezoelectric**
A-31, B-18, G-12, R-30.
- DIALS**
A-17, A-29, A-56, B-31, C-39, C-41, D-5, E-10, G-12, G-24, H-3, I-5, K-3, K-18, M-5, N-3, N-15, P-1, P-12, P-13, P-22, P-25, R-2, R-19, S-7, S-18, S-26, T-24, W-5.
- DIAL LIGHTS**
B-12, M-5, M-8, N-2, N-3, P-12, P-25, Y-2.
- FIBRE, Vulcanized sheet, rod and tube**
C-29, I-5, N-9, P-12, S-25.
- FILAMENT BALLASTS**
A-6, L-12, M-23, P-12, S-25.
- GRID LEAKS, Fixed**
A-14, A-24, C-5, D-15, E-1, E-8, H-5, I-6, L-12, M-13, M-23, N-3, P-1, P-12, P-16, S-10, W-2.
- GRID LEAKS, Variable**
A-21, A-39, C-12, C-17, C-43, E-1, E-8, G-1, H-4, M-23, R-10, W-2.
- GRID LEAK HOLDERS (See MOUNTINGS, Resistor)**
- HEADSETS**
A-15, A-34, B-3, C-3, F-11, F-22, G-25, P-1, T-15.
- INSULATION, Composition**
A-7, A-17, A-29, B-36, C-2, C-29, F-16, G-11, I-1, I-5, K-18, L-11, M-14, N-9, P-13, S-8, S-26, W-5.
- INSULATORS (See AERIAL INSULATORS)**
- INTERFERENCE ELIMINATORS**
A-14, T-12.
- JACKS**
A-2, A-17, B-7, B-31, B-37, C-7, D-5, E-5, E-8, F-22, G-12, K-5, P-1, P-12, P-25, S-26, Y-2.

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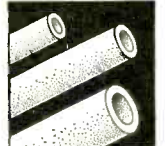
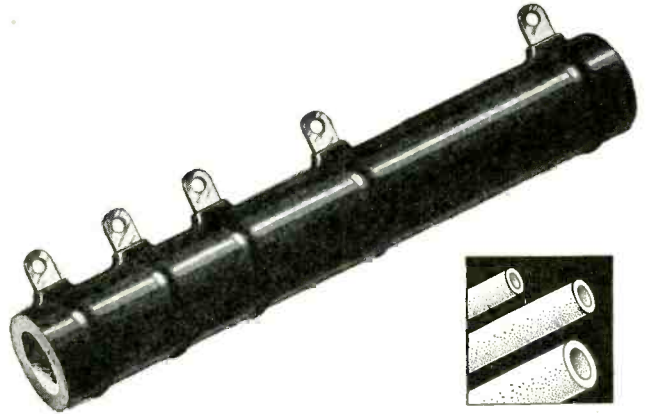
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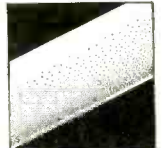
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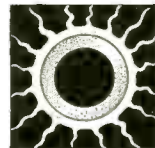


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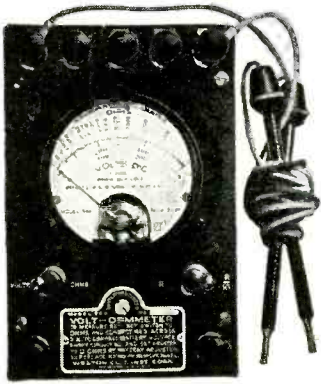
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- I-3 Ingrad Condenser & Mfg. Co., 4322 Lake Ave., Rochester, N. Y.
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- I-6 International Resistance Co., 2006 Chestnut St., Philadelphia, Pa.
- J-1 Jaeger Research Labs., 270 Park Ave., Weehawken, N. J.
- J-2 Jefferson Electric Co., 1500 S. Laflin St., Chicago, Ill.
- J-3 Jenkins & Adair, Inc., 3333 Belmont Ave., Chicago, Ill.
- J-4 Jenkins Glass Co., Kokomo, Ind.
- J-5 Jenkins Television Corp., 346 Claremont Ave., Jersey City, N. J.
- J-6 Jensen Radio Mfg. Co., 6601 S. Laramie Ave., Chicago, Ill.
- J-7 Jewell Electrical Instrument Co., 1640 Walnut St., Chicago, Ill.
- J-7a Johnsonburg Radio Corp., Johnsonburg, Pa.
- J-8 Howard B. Jones, 2300 Wabansia Ave., Chicago, Ill.
- J-9 Jones-Motrola Sales Co., 370 Gerard Ave., N. Y. C.
- K-1 K & H Electric Corp., 68 Springfield Ave., Newark, N. J.
- K-2 F. Kallus Mfg. Co., 104 Court St., Hoboken, N. J.
- K-3 Karas Electric Co., 4040 N. Rockwell St., Chicago, Ill.
- K-4 Kato Co., 727 So. Front, Mankato, Minn.
- K-5 Kellogg Switchboard & Supply Co., 1066 W. Adams St., Chicago, Ill.
- K-6 Kendrick & Davis Co., Lebanon, N. H.
- K-7 Colin B. Kennedy Corp., 212 W. Ewing Ave., South Bend, Ind.
- K-8 The Ken-Rad Corp., Owensboro, Ky.
- K-9 Kersten Radio Equipment, Inc., 1415 Fulford St., Kalamazoo, Mich.
- K-10 Kester Solder Co., 4201 Wrightwood Ave., Chicago, Ill.
- K-11 Keystone Radio Labs., Inc., 129 N. Jefferson St., Chicago, Ill.
- K-12 Kimley Electric Co., 2665 Main St., Buffalo, N. Y.
- K-13 King Mfg. Corp., 254 Rano St., Buffalo, N. Y.
- K-14 Knapp Electric, Inc., Port Chester, N. Y.
- K-15 Knox Porcelain Corp., Knoxville, Tenn.
- K-16 The Knoxville Table & Chair Co., P. O. Box 1087, Knoxville, Tenn.
- K-17 The Kodel Electric & Mfg. Co., 507 E. Pearl St., Cincinnati, Ohio.
- K-18 The Kurz Kasch Co., 1415 S. Broadway, Dayton, Ohio.
- K-19 Kwik Test Radio Labs., 4464 Cass Ave., Detroit, Mich.
- L-1 Langbein-Kaufman Radio Co., 62 Franklin, New Haven, Conn.
- L-2 La Salle Radio Corp., 143 W. Austin Ave., Chicago, Ill.
- L-3 C. R. Leutz, Inc., 195 Park Place, Long Island City, N. Y.
- L-4 Liberty Bell Mfg. Co., Minerva, Ohio.
- L-5 Liberty Electric Corp., of New York, 342 Madison Ave., N. Y. C.
- L-6 Liberty Radio Corp., 123 N. Sangamon, Chicago, Ill.
- L-7 Lincoln Radio Corp., 329 So. Wood St., Chicago, Ill.
- L-8 The Logan Mfg. Co., 338 E. Front St., Logan, Ohio.
- L-9 I. A. Lund Corp., 1018 S. Wabash Ave., Chicago, Ill.
- L-10 Lundquist Tool & Mfg. Co., Worcester, Mass.
- L-11 Luzerne Rubber Co., Muirhead Ave., Trenton, N. J.
- L-12 Lynch Mfg. Co., Inc., 1775 Broadway, N. Y. C.
- M-1 Magnatron Corp., 406 Jefferson, Hoboken, N. J.
- M-2 The Magnavox Co., 1315 S. Michigan Ave., Chicago, Ill.
- M-3 Markel Electric Products, Inc., 145 E. Seneca St., Buffalo, N. Y.
- M-4 Marti Radio Corp., 18th and Springdale Ave., E., Orange, N. J.
- M-5 Martin-Copeland Co., Providence, R. I.
- M-6 Marvin Radio Tube Corp., Irvington, N. J.
- M-7 Master Engineering Co., 122 So. Michigan Ave., Chicago, Ill.
- M-8 Matchless Electric, 1500 N. Ogden Ave., Chicago, Ill.
- M-9 Mayo Laboratories, Inc., 281 E. 137th St., N. Y. C.
- M-10 L. C. McIntosh, 4163 Budlong Ave., Los Angeles, Calif.
- M-11 McKee Glass Co., Jeannette, Pa.
- M-12 McMillan Radio Corp., 1421 S. Michigan Ave., Chicago, Ill.
- M-12a Meissner Mfg. Co., 522 S. Clinton St., Chicago, Ill.
- M-13 Micamold Radio Corp., 1087 Flushing Ave., Brooklyn, N. Y.
- M-14 Micarta Fabricators, Inc., 500 S. Peoria St., Chicago, Ill.
- M-15 Midwest Radio Corp., 410 E. 8th St., Cincinnati, Ohio.
- M-16 Minerva Radio Co., 154 E. Erie St., Chicago, Ill.
- M-17 Modern Electric Mfg. Co., 312 Mulberry, Toledo, Ohio.
- M-18 Morris Register Co., Council Bluffs, Iowa.
- M-19 C. E. Mountford, 105 Sixth Ave., N. Y. C.
- M-20 Mueller Elec. Co., 1583 E. 31st St., Cleveland, Ohio.
- M-21 Munder Electrical Co., 97 Orleans, Springfield, Mass.
- M-22 Wm. J. Murdock, Chelsea, Mass.
- M-23 Leslie F. Muter Co., 8440 S. Chicago Ave., Chicago, Ill.
- M-24 Mutual Phone Parts Mfg. Corp., 610 Broadway, N. Y. C.
- N-1 Nassau Radio Co., 60 Court St., Brooklyn, N. Y.
- N-2 National Carbon Co., Inc., 30 E. 42nd St., N. Y. C.
- N-3 National Co., Inc., 61 Sherman St., Malden, Mass.
- N-4 National Electrical Products Co., 10 E. Kinzie St., Chicago, Ill.
- N-5 National Electric Specialty Co., 314 N. St. Clair, Toledo, Ohio.
- N-6 National Radio Corp., 680 Beacon St., Boston, Mass.
- N-7 National Radio Tube Co., 3420 18th St., San Francisco, Calif.
- N-7a National Transformer Corp., 205 W. Wacker Drive, Chicago, Ill.
- N-8 National Union Radio Corp., 400 Madison Ave., N. Y. C.
- N-9 National Vulcanized Fibre Co., Maryland Ave. and Beech St., Wilmington, Del.
- N-10 Neonlite Corp. of America, 500 Chancellor Ave., Irvington, N. J.
- N-11 Neutrowound Radio Mfg. Co., 3409 W. Madison St., Chicago, Ill.
- N-12 New England Electrical Works, Lisbon, N. H.
- N-13 Northern Mfg. Co., 371 Ogden St., Newark, N. J.
- N-14 Northwestern Cooperage & Lbr. Co., Gladstone, Mich.
- N-15 Norton Labs., Lockport, N. Y.
- O-1 Ohmite Mfg. Co., 613 N. Albany Ave., Chicago, Ill.
- O-2 Old Masters Paper & Pulp Corp., 154 Nassau St., N. Y. C.
- O-3 O'Neil Mfg. Corp., 715 Palisade Ave., West New York, N. J.
- O-4 Operadio Mfg. Co., 613 N. Albany Ave., Chicago, Ill.
- O-5 Oxford Radio Corp., 3200 Carroll Ave., Chicago, Ill.
- P-1 Pacent Electric Co., Inc., 91 7th Ave., N. Y. C.
- P-2 Packard Electric Co., Warren, Ohio.
- P-3 R. M. Peffer, Harrisburg, Pa.
- P-4 Perryman Electric Co., 33 W. 60th St., N. Y. C.
- P-5 Pfanstiehl Radio Co., 10 E. Kinzie, Chicago, Ill.
- P-6 Philadelphia Storage Battery Co., Ontario and C Sts., Philadelphia, Pa.
- P-7 Philmore Mfg. Co., 106 7th Ave., N. Y. C.
- P-8 Phono-Link Co., 490 Broome, N. Y. C.
- P-9 Phonomotor Co., 121 West Ave., Rochester, N. Y.
- P-10 Pierce-Airo, Inc., 119 Fourth Ave., N. Y. C.
- P-11 The Pierson Co., Cedar and Pleasant Sts., Rockford, Ill.
- P-12 Pilot Electric Mfg. Co., 323 Berry St., Brooklyn, N. Y.
- P-13 Pioneer Radio Corp., Plano, Ill.
- P-14 Platter Cabinet Co., Madison Ave., North Vernon, Ind.
- P-15 J. L. Polk, 41 Belle Ave., Troy, N. Y.
- P-16 Polymet Mfg. Corp., 829 E. 134th St., N. Y. C.
- P-17 The Pooley Co., 1600 Indiana Ave., Philadelphia, Pa.
- P-18 Porcelain Products, Inc., Findlay, Ohio.
- P-19 The Potter Co., 1950 Sheridan Rd., North Chicago, Ill.
- P-20 Harold J. Power, 5 High St., Medford Hillside, Mass.
- P-21 Powrad, Inc., 121 Ingraham Ave., Brooklyn, N. Y.
- P-22 Precise Products, Inc., 254 Mill St., Rochester, N. Y.
- P-23 Precision Mfg. Co., 1020 Santa Fe Ave., Los Angeles, Calif.
- P-24 Premax Products, Inc., Niagara Falls, N. Y.
- P-25 Premier Electric Co., Grace and Ravenswood Aves., Chicago, Ill.
- P-26 Premier Radio Corp., Defiance, Ohio.
- P-27 Presto Machine Products Co., Inc., 70 Washington St., Brooklyn, N. Y.
- P-28 Prime Mfg. Co., 653 Clinton, Milwaukee, Wis.
- P-29 M. Propp Co., 524 Broadway, N. Y. C.
- Q-1 QRS-DeVry Corp., 1111 Center St., Chicago, Ill.
- Q-2 Quam Radio Products Co., 9705 Cottage Grove Ave., Chicago, Ill.
- Q-3 Quinn Tube, 1890 E. 40th, Cleveland, Ohio.
- R-1 Racon Electric Co., Inc., 18 Washington Place, N. Y. C.
- R-2 Radiall Co., 50 Franklin St., N. Y. C.
- R-3 Radiart Corp., Inc., 13229 Shaw Ave., E. Cleveland, Ohio.
- R-4 Radio Appliance Corp., Springfield, Mass.
- R-5 Radio Cabinet Co., 818 Butterworth St., Grand Rapids, Mich.
- R-6 Radio Cabinet Co., Seminary St., Rockford, Ill.
- R-7 Radio Condenser Co., Copewood and Davis Sts., Camden, N. J.
- R-8 Radio Corp. of America, 233 Broadway, N. Y. C.
- R-9 Radio Engineering Labs., 100 Wilbur Ave., Long Island City, N. Y.
- R-10 Radio Foundation, Inc., 1 Park Place, N. Y. C.
- R-11 Radio Insulation, Parkersburg, W. Va.
- R-12 Radio Master Corp., Bay City, Mich.
- KEYS, SOUNDERS AND BUZZERS**
K-5, M-10, S-17, S-26, T-3, V-6.
- LOUDSPEAKERS**
A-2, A-15, A-18, A-19, A-27, A-34, A-40, A-43, A-44, A-55, A-59, B-3, B-5, B-17, B-25, B-28, B-33, B-34, B-35, C-3, C-32, C-39, E-18, F-4, F-9, F-11, F-18, G-25, H-13, J-6, K-7, K-9, M-2, M-22, M-23, N-2, O-3, O-4, O-5, P-1, P-6, P-11, P-14, P-17, P-27, Q-2, R-1, R-8, R-10, R-17, R-29, S-18, S-19, S-22, S-28, S-33, S-35, S-36, S-39, T-6, T-15, T-22, U-3, U-7, U-9, U-10, U-12, U-16, V-2, W-14, W-23, W-26.
- LUGS, Soldering**
A-17, B-6, B-19, K-5, L-6, S-7, W-5, Y-2.
- MARKERS, Metal Cable**
C-41, W-5, Y-2.
- METERS, D-C, A-C and Thermo**
B-12a, D-12, F-7, G-6, H-14, H-20, J-7, R-13, R-22, S-33, S-45, W-11, W-12.
- MOTORS, Phonograph**
A-22, A-51, B-21, B-34, D-10, G-6, G-21, H-3a, J-9, K-6, L-5, P-1, P-9, P-28, S-17, S-22, S-35, S-40, U-7, U-16, W-11.
- MOUNTINGS, Resistor**
A-14, C-17, D-5, E-1, E-8, I-6, K-5, L-12, M-19, M-23, N-3, P-12, P-16.
- OUTLETS, Convenience Wall**
B-12, B-37, C-7, E-1, F-22, H-10, R-28, S-47, Y-2.
- PANELS, Composition**
A-29, F-7, F-14, F-16, F-22, I-5, L-11, P-12, P-23, R-19.
- PANELS, Metal**
A-24, A-59, B-10, B-35, C-11, C-29, C-39, C-41, N-3, P-12, R-14, R-19, S-7, S-33, U-5, V-4.
- PICKUPS, Phonograph**
A-17, A-22, A-27, A-28, A-40, A-41, A-55, A-57, B-36, C-3, C-39, E-9, E-10, G-21, H-4, M-24, P-1, P-8, P-27, R-3, S-17, S-35, S-39, S-40, T-14, T-22, U-2, U-7, U-15a, U-16, W-8.
- PLATES, Name**
A-15, A-59, B-7, C-7, C-41, S-7, W-11.
- PLUGS, Phone and Multiple Connector**
B-12, B-26, D-5, E-1, F-22, G-12, H-10, M-5, M-23, N-3, P-7, P-12, P-16, S-26, Y-2.
- REACTIVATORS, Tube**
I-6, J-2, S-33.
- RECEIVING SETS**
A-3, A-11, A-19, A-27, A-39, A-41, A-43, A-55, A-58, A-60, A-61, B-2, B-3, B-4, B-11, B-24, B-28, B-33, B-34, B-35, B-36, B-39, C-19, C-20, C-21, C-31, C-39, D-2, D-3, D-4, D-6, E-6, E-9, E-10, E-20, F-18, F-19, G-16, G-24, G-25, G-27, G-29, G-30, G-32, H-9, H-19, K-5, K-7, K-11, K-13, L-1, L-3, L-6, M-4, M-12, M-15, M-16, N-1, N-2, N-3, N-4, N-6, N-11, P-5, P-6, P-7, P-10, P-11, P-13, P-25, P-26, Q-1, R-8, R-13, R-17, R-32, S-6, S-11, S-12, S-13, S-14, S-15, S-17, S-18, S-19, S-22, S-23, S-32, S-33, S-36, S-38, S-39, T-6, T-9, T-11, T-16, T-17, T-23, U-7, U-9, U-11, U-12, V-1, W-1, W-3, W-4, W-9, W-11, W-14, W-22, W-24, W-25, Z-1, Z-2.
- RECEIVING SET KITS OR CHASSES**
A-13, B-33, E-1, G-24, G-27, H-3, H-5, H-15, K-3, L-3, L-7, N-3, N-7a, P-12, P-25, R-9, R-27, S-6, S-11, S-18, T-24, V-7.
- RECTIFIER UNITS**
A-1, A-46, A-47, B-4, B-20a, D-6, E-18, F-4, F-17, G-3, K-14, K-17, N-3, P-6, R-14, S-19, T-15.
- REMOTE CONTROL UNITS**
B-3, C-19, U-16.
- RESISTORS, Fixed Carbon**
A-21, C-12, C-17, H-4, I-6, M-13, M-19.



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Model 564
Volt-Ohmmeter
 For checking
Voltages & Resistance
 and
Continuity of Circuits

THIS instrument is ideally suited to the needs of radio service men. Besides it is very useful for general purposes in radio laboratories.

Model 564 is compact, completely self-contained. It is typically Weston in design and manufacture. Though moderately priced, gives that same dependable service for which all Weston instruments are known.

It consists of a Model 301, 3 1/4 inch diameter meter with ranges of 3, 30, 300 and 600 volts (all 1000 ohms per volt) and two resistance ranges 0-10,000 and 0-100,000 ohms. Two toggle switches serve to connect the various ranges of the meter in circuit. A pair of 30" cables with long test prods is provided with each instrument.

Testing continuity of high and low resistance circuits is simplified by means of a toggle switch which changes the sensitivity of the meter to either 1 or 10 milliamperes. Accuracy 2%. Size 5 1/2" x 3 3/8" x 2 1/8" deep (excluding binding posts). Weight 2.3 lbs. (including self-contained "C" battery).

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 Graybar Electric Co., Inc. 84 Marion St. Seattle, Wash.
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 A. A. Barbera Los Angeles, Calif.
 Repair Service Laboratory 682 Mission St. San Francisco, Calif.

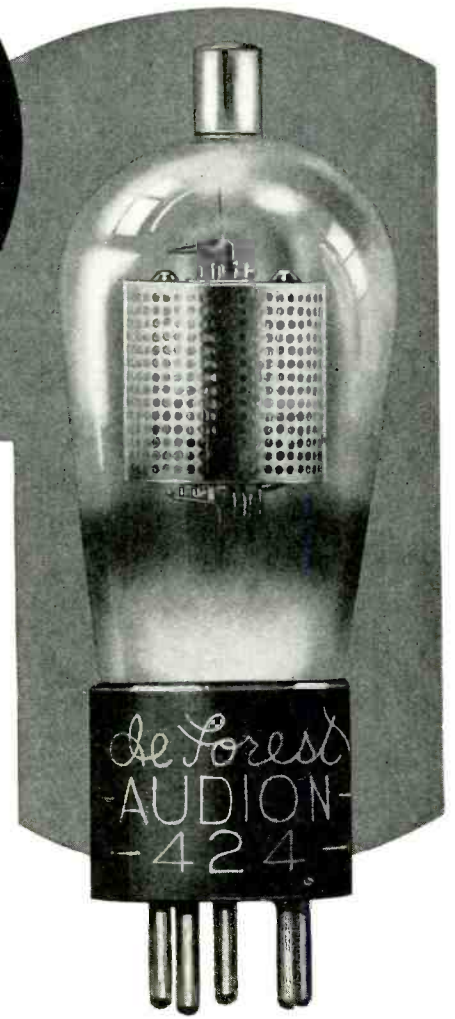
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 PIONEERS SINCE 1888
INSTRUMENTS
WESTON ELECTRICAL INSTRUMENT CORPORATION
 600 Frelinghuysen Ave. Newark, N. J.



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We have responded with the de Forest Type 424 Screen Grid Tube and the perfected 427 Audion. That we have successfully met the challenge of the trade is conclusively proved by the many glowing reports from radio set manufacturers, dealers and service men. The greater degree of vacuum of these tubes, their rugged oxide-coated filaments, extreme sensitivity, uniformity and demonstrated long life reveal them as the radio tubes you have been waiting for.

Push de Forest Tubes. In so doing, you are showing your customers that not only are you interested in the sale of a tube, but also what it does after it goes into his set.



de Forest **RADIO TUBES**
 (AUDIONS)

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Gosilco Super Aerial Wire
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- R-16 Radio Utilities Corp., 67 Winthrop, Newark, N. J.
- R-17 Radio-Victor Corp., 233 Broadway, N. Y. C.
- R-18 Radio Wire Corp., 6629 Central Park Ave., Chicago, Ill.
- R-19 Ranger Coil Co., W. Davenport, N. Y.
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- R-21 R. E. M. Mfg. Co., Logansport, Ind.
- R-22 Readrite Meter Works, 15 College Ave., Bluffton, Ohio.
- R-23 Red Lion Cabinet Co., Red Lion, Pa.
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- R-25 A. E. Rittenhouse Co., Honeoye Falls, N. Y.
- R-26 Rival Radio & Battery Co., 180 E. 123rd St., N. Y. C.
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- R-29 The Rola Co., 4250 Hollis St., Oakland, Calif.
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- R-33 Runzel-Linz Electric Mfg. Co., 1751 N. Weston Ave., Chicago, Ill.
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- S-19 Simplex Radio Co., Sandusky, Ohio.
- S-20 B. H. Smith, Danbury, Conn.
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- S-22 Sonora Phonograph Co., Inc., 50 West 57th St., N. Y. C.
- S-23 The Sparks-Withington Co., Jackson, Mich.
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- S-25 Spaulding Fibre Co., Inc., 484 Broome St., N. Y. C.
- S-26 Specialty Insulation Mfg. Co., Hoosick Falls, N. Y.
- S-27 Sprague Specialties Co., 1511 Hancock St., Quincy, Mass.
- S-28 Standard Radio Corp., 41 Jackson St., Worcester, Mass.
- S-29 Standard Transformer Co., Warren, Ohio.
- S-30 The Starr Piano Co., S. 1st and A, B, C and D Sts., Richmond, Ind.
- S-31 Starr Porcelain Co., Trenton, N. J.
- S-32 Steinite Radio Co., Fort Wayne, Ind.
- S-33 The Sterling Mfg. Co., 2831 Prospect Ave., Cleveland, Ohio.
- S-34 Stettner Phonograph Corp., 310 E. 75th St., N. Y. C.
- S-35 Stevens Mfg. Corp., 46 Spring St., Newark, N. J.
- S-36 Stewart-Warner Speedometer Corp., 1826 Di-versey Parkway, Chicago, Ill.
- S-37 St. Johns Table Co., Cadillac, Mich.
- S-38 Story & Clark Piano Co., 172 N. Michigan Ave., Chicago, Ill.
- S-39 Stromberg-Carlson Tel. Mfg. Co., Rochester, N. Y.
- S-40 Studner Bros., 67 W. 44th St., N. Y. C.
- S-41 Sturges Multiple Battery Corp., Jamaica, N. Y.
- S-42 Sunlight Lamp Co., 76 Colt, Irvington, N. J.
- S-43 Superior Cabinet Corp., 206 Broadway, N. Y. C.
- S-44 Supertron Mfg. Co., Hoboken, N. J.
- S-45 Supreme Instruments Corp., Bright Bldg., Greenwood, Miss.
- S-46 Swaboda Co., 612 E. Pike St., Seattle, Wash.
- S-47 Swan-Haverstick, Inc., Trenton, N. J.
- S-48 Sylvania Products Co., Emporium, Pa.
- S-49 Sturges Multiple Battery Corp., Jamaica, N. Y.
- T-1 Taylor Electric Co., Madison, Wis.
- T-2 Tectron Radio Corp., 1270 Broadway, N. Y. C.
- T-3 Teleplex Co., 76 Cortlandt, N. Y. C.
- T-4 Teleradio Engineering Corp., 484 Broome St., N. Y. C.
- T-5 Televocal Corp., 588 12th St., West New York, N. J.
- T-6 Temple Corp., 5253 W. 65th St., Chicago, Ill.
- T-7 Therm-A-Trol Mfg. Co., 52 Willow, Springfield, Mass.
- T-8 Thomas & Betts Co., 15 Park Place, N. Y. C.
- T-9 Thompson Radio Co., 25 Church, N. Y. C.
- T-10 Thordarson Electric Mfg. Co., 500 W. Huron St., Chicago, Ill.
- T-11 Tiltman Radio Corp., Lagro, Ind.
- T-12 Tobe Deutschmann Co., 136 Liberty St., N. Y. C.
- T-13 Todd Electric Co., 42 Vesey, N. Y. C.
- T-14 Tomad & Co., 2621 W. 21st St., Chicago, Ill.
- T-15 Tower Mfg. Corp., 124 Brookline Ave., Boston, Mass.
- T-16 Transformer Corp. of America, 2301 S. Keeler Ave., Chicago, Ill.
- T-17 Travler Mfg. Corp., 1818 Washington Ave., St. Louis, Mo.
- T-18 Trenle Porcelain Co., East Liverpool, Ohio.
- T-19 Triad Mfg. Co., Inc., Fountain and Blackstone Sts., Pawtucket, R. I.
- T-20 Tri-Boro Radio Mfg. Corp., 62 W. 21st St., N. Y. C.
- T-21 Trico Products Corp., 817 Washington, Buffalo, N. Y.
- T-22 Trimm Radio Mfg. Co., 847 W. Harrison, Chicago, Ill.
- T-23 Trutone Radio Sales Co., 114 Worth, N. Y. C.
- T-24 Tyrman Electric Corp., 314 W. Superior St., Chicago, Ill.
- U-1 The Udell Works, 1202 W. 28th St., Indianapolis, Ind.
- U-2 Ultraphonic Products Corp., 270 Lafayette, N. Y. C.
- U-3 Ultratone Mfg. Co., 1046 W. Van Buren St., Chicago, Ill.
- U-4 Union Electrical Porcelain Works, Muirhead Ave., Trenton, N. J.
- U-5 Union Insulating Co., 296 Broadway, N. Y. C.
- U-6 Union Metal Products Co., 2938 Pillsbury Ave., Minneapolis, Minn.
- U-7 United Air Cleaner Co., 9705 Cottage Grove Ave., Chicago, Ill.
- U-8 United Radio & Electric Corp., 500 Chancellor Ave., Irvington, N. J.
- U-9 United Reproducers Corp., Springfield, Ohio.
- U-10 United Research Labs., Inc., 864 W. North Ave., Chicago, Ill.
- U-11 United Scientific Lab., Inc., 113 Fourth Ave., N. Y. C.
- U-12 U. S. Radio & Television Corp., Marion, Ind.
- U-13 Universal Battery Co., 3410 S. La Salle, Chicago, Ill.
- U-14 Universal Electric Lamp Co., Newark, N. J.
- U-15 Universal Electro Chemical Corp., 30 W. 15th St., N. Y. C.
- U-15a Upco Products Corp., 270 Lafayette St., N. Y. C.
- U-16 The Utah Radio Products Co., 1737 S. Michigan Ave., Chicago, Ill.
- V-1 Vaga Mfg. Co., 720 Atlantic Ave., Brooklyn, N. Y.
- V-2 Valley Appliances, Inc., 634 Lexington Ave., Rochester, N. Y.
- V-3 Valley Electric Co., 4221 Forest Park Blvd., St. Louis, Mo.
- V-4 Van Doorn Co., 160 N. La Salle St., Chicago, Ill.
- V-5 Van Horne Tube Co., 280 Center St., Franklin, Ohio.
- V-6 Vibroplex Co., 825 Broadway, N. Y. C.
- V-7 Victoreen Radio Co., 2825 Chester Ave., Cleveland, Ohio.
- W-1 Walbert Radio Corp., 1000 Fullerton Ave., Chicago, Ill.
- W-2 Ward Leonard Electric Co., Mt. Vernon, N. Y.
- W-3 Ware Mfg. Corp., Broad St. Bank Bldg., Trenton, N. J.
- W-4 Wasmuth-Goodrich Co., Peru, Ind.
- W-5 Waterbury Button Co., Waterbury, Conn.
- W-6 Watstown Table & Furniture Co., Watstown, Pa.
- W-7 The Webster Co., 850 Blackhawk St., Chicago, Ill.
- W-8 Webster Electric Co., Racine, Wis.
- W-9 Wells Gardner & Co., 816 N. Kenzie Ave., Chicago, Ill.
- W-10 Western Felt Works, 4029 Ogden Ave., Chicago, Ill.
- W-11 Westinghouse Electric & Mfg. Co., Pittsburgh, Pa.
- W-12 Weston Electrical Instrument Corp., 614 Freelinghuysen Ave., Newark, N. J.
- W-13 T. C. Wheaton Co., Millville, N. J.
- W-14 Wilcox Labs., Charlotte, Mich.
- W-15 Willard Storage Battery Co., 346 E. 131st St., Cleveland, Ohio.
- W-16 Winnebago Mfg. Co., Rockford, Ill.
- W-17 Wireless Corp. of America, 1744 N. Robey, Chicago, Ill.
- W-18 Wireless Egert Eng., Inc., 179 Greenwich St., N. Y. C.
- W-19 Wireless Specialty Appliance Co., 76 Atherton St., Jamaica Plain, Mass.
- W-20 Wise-McClung Corp., New Philadelphia, Ohio.
- W-21 Wirt Co., 5221 Greene (Germantown), Philadelphia, Pa.
- W-22 Wiz Mfg. Co., 225 Sixth Ave., N. Y. C.
- W-23 J. W. & W. L. Wolf, 133 W. 21st St., N. Y. C.
- W-24 Workrite Radio Corp., 1838 E. 30th St., Cleveland, Ohio.
- W-25 World Electric Co., San Dimas, Calif.
- W-26 Wright-DeCoster, Inc., 2233 University Ave., St. Paul, Minn.
- W-27 Wubco Battery Corp., Swissvale Sta., Pittsburgh, Pa.
- X-1 X-L Radio Labs., 1224 Belmont Ave., Chicago, Ill.
- Y-1 Yahr-Lang, Inc., 207 E. Water, Milwaukee, Wis.
- Y-2 Yaxley Mfg. Co., 1528 West Adams, Chicago, Ill.
- Z-1 Zaney-Gill Corp., 5912 So. Western Ave., Los Angeles, Cal.
- Z-2 Zenith Radio Corp., 3620 Iron St., Chicago, Ill.
- RESISTORS, Fixed Processed**
A-14, C-5, C-7, C-17, C-38, E-8, H-4, I-6, L-12, M-13, M-19, N-3, P-12, P-16, R-2, W-21.
- RESISTORS, Fixed Wire Wound**
A-14, A-36, C-7, C-17, C-38, D-1a, D-5, E-8, E-10, F-7, F-22, G-6, G-12, K-19, L-3, M-9, M-13, M-19, M-23, N-3, O-1, P-1, P-12, P-16, R-22, R-27, S-10, W-2, W-21, Y-2.
- RESISTORS, Variable Carbon**
A-21, B-31, C-7, C-17, E-8, F-22, K-5, P-12, P-16.
- RESISTORS, Variable Wire Wound**
C-7, C-17, C-43, D-5, E-8, E-10, F-22, G-8, G-12, H-4, K-19, M-19, M-23, N-3, P-1, P-7, P-12, P-16, R-19, U-11, V-7, W-2, W-21, Y-2.
- SHIELDS**
A-24, C-7, C-11, C-39, G-24, L-3, N-3, P-12, S-18.
- SOCKETS, Tube**
A17, A-29, A-56, B-14, C-11, C-43, D-5, E-5, E-10, F-22, G-12, G-24, I-1, I-5, K-5, K-17, K-19, N-3, N-15, P-1, P-12, P-13, P-25, R-19, S-4, S-11, S-18, U-5.
- SOLDER, Self-Fluxing**
K-10.
- SWITCHES AND SWITCH CONTACTS**
A-15, B-6, B-12, B-31, C-7, C-12, C-43, E-10, F-1, F-11, F-22, G-12, G-18, H-10, H-11, H-15, K-4, K-5, M-23, P-1, P-12, P-22, R-11, R-19, S-4, U-5, W-19, Y-2.
- TESTING EQUIPMENT, Tube and Set**
B-12a, E-13, F-7, F-11, G-12, H-12, H-14, H-20, J-7, K-19, L-3, L-10, N-3, P-3, P-29, R-9, R-13, R-22, S-17, S-33, S-45, T-1, T-22, W-2, W-12.
- TRANSFORMERS, Audio**
A-4, A-5, A-13, A-36, A-39, B-8, C-7, C-14, C-21, C-22, D-16, F-5, F-7, F-14, G-2, G-3, G-8, G-12, G-13, G-22, G-24, H-1, H-3, H-5, J-2, K-3, K-5, L-6, M-23, N-3, N-15, P-1, P-12, P-16, P-22, P-25, R-19, R-20, R-25, R-27, S-1, S-2, S-4, S-5, S-18, S-29, T-10, T-16, V-4, V-7, W-8.
- TRANSFORMERS, Power**
A-4, A-5, A-6, A-13, A-36, A-46, B-8, B-24, B-31, C-7, C-14, C-22, D-12, D-16, E-13, E-18, F-1, F-7, F-8, F-17, G-3, G-4, G-8, G-12, G-13, G-22, G-24, H-1, H-12, J-2, K-3, K-5, K-11, K-12, K-17, K-19, L-3, M-9, M-23, N-3, N-12, P-12, P-16, R-2, R-3, R-10, R-25, S-11, S-18, S-20, S-29, T-10, T-24, U-5, V-7, W-7, W-19.
- TRANSFORMERS, R-F (See COILS, R-F)**
- TRANSMITTING APPARATUS**
A-4, A-13, A-31, C-6, D-4, E-11, F-22, G-12, G-28, H-12, H-16, K-5, L-3, N-3, N-7, R-9, R-17, S-2, S-20, T-10, T-12, W-18.
- TUBING, Spaghetti**
A-7, A-15, I-5.
- UNITS, Loudspeaker and Phonograph**
A-2, A-13, A-22, B-3, B-5, B-17, C-20, E-7, E-10, E-18, F-9, F-11, H-15, M-23, R-29, S-22, S-46, T-15.
- VACUUM TUBES**
A-8, A-20, A-27, A-47, A-48, A-49, A-53, A-54, B-3, B-22, B-27, C-1, C-10, C-13, C-27, C-28, C-30, C-42, D-4, D-8, D-9, D-11, D-13, D-17, E-16, E-20, G-14, G-20, G-29, H-23, H-24, J-1, J-7a, K-1, K-5, K-8, L-2, M-1, M-6, M-8, M-21, N-2, N-7, N-8, N-10, N-13, P-4, P-6, P-7, P-12, Q-3, R-15, R-16, S-11, S-21, S-42, S-44, S-48, T-2, T-5, T-19, U-7, U-8, U-14, V-5, W-11, W-17.
- VOLTAGE REGULATORS**
A-4, A-38, C-17, E-1, G-1, I-5, M-7, N-3, R-22, W-2, W-21, X-1.



Handy carton of four
Eveready Raytheon
B-H Tubes

SUGGEST!!! EVEREADY RAYTHEON B-H REPLACEMENTS FOR "B" ELIMINATORS

TRY it for a week! Keep a carton of Eveready Raytheon B-H Tubes right out front. Suggest them to customers. A new B-H tube makes a big difference in reception.

Because B-H, original gaseous, rectifying tubes, are standard with over 100 makes of "B" power units. Most units were designed for the B-H. The replacement market is tremendous.

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New York San Francisco

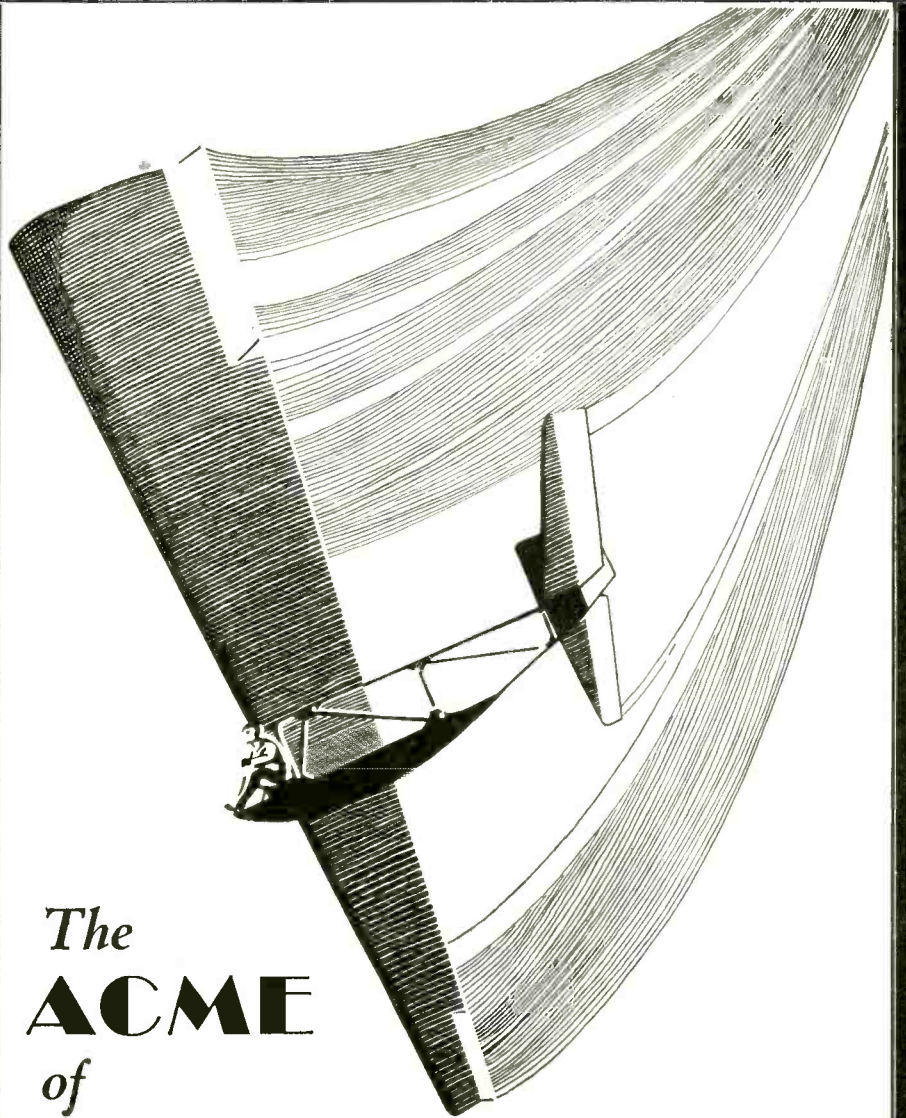
Unit of Union Carbide



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Trade-marks



The ACME of *smooth performance*

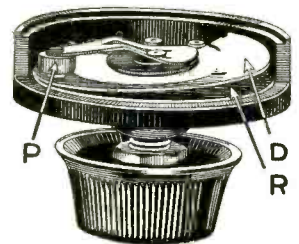
CATAPULTED silently into the air, the glider taking advantage of every tiny air current, soars noiselessly and gracefully up and down the air valleys at the touch of the control stick.

It's the acme of smooth performance.

The modern radio receiver, if it is CENTRALAB equipped, figuratively speaking, rides the ether waves smoothly and noiselessly.

For real adventure in radio reception insist on CENTRALAB volume control equipment.

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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.

Announcing new Constant Independence Volume Control for Projection Purposes. Write for special bulletin.

Centralab

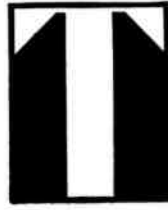
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Tell them you saw it in RADIO



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TRANSFORMERS

is to think of
THORDARSON

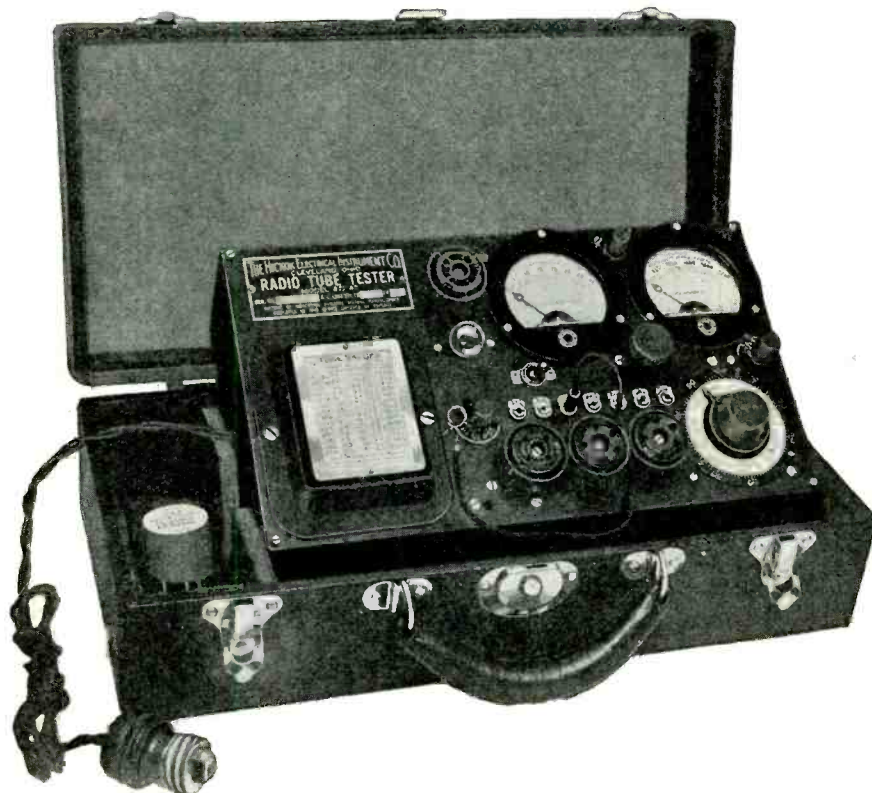
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APPLIES CORRECT D.C. GRID VOLTS.

APPLIES CORRECT FILAMENT VOLTS.

INDICATES DIRECTLY, DYNAMIC MUTUAL CONDUCTANCE AND PLATE CURRENT.

TESTS ALL TYPE TUBES INCLUDING THE NEW 2-VOLT TYPE.

The AC-47 Radio Tube Tester is the first jobbers and dealers type tester to be placed on the market operating from 110 volt A.C. line, which actually applies D.C. TO THE PLATE, and at the same time, delivers the correct amount of D.C. GRID BIAS.

In all other types of tube testers now on the market, Raw A.C. is applied to the plate, and the tube is made to act as its own rectifier. It is impossible to get an accurate check of any tube unless D.C. is applied to the plate.

In the AC-47 Radio Tube Tester, all the voltages are standardized and are absolutely INDEPENDENT OF LINE VOLTAGE FLUCTUATIONS.

MUTUAL CONDUCTANCE is the most important determining constant of the excellence of any radio tube, and the AC-47 is the first to be placed on the market, which actually indicates this constant DIRECTLY ON A METER.

Write for Bulletin No. 27, containing complete description and prices.

Write for Bulletin No. 26, which contains complete description and price of the New Hickok SG-4600 Radio Set Tester, which contains direct reading ohmmeter and capacity meter.

The Hickock Electrical Instrument Co.
CLEVELAND, OHIO



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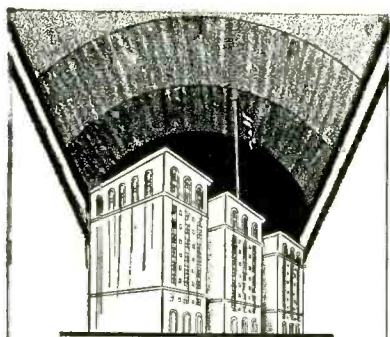
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CHEF'S RECIPES
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THE NEW HOTEL
JEFFERSON
800 ROOMS

CHICAGO

ROESSLER & TEICH
OWNERS AND MANAGERS

Tell them you saw it in RADIO

Have You Seen Our

Radio Bargain Bulletin No. 31?

Here Are a Few of the Items It Contains:

Thordarson Double Filter Choke, Model T-2458, contains two 18	Henry
250 Mill Chokes.....	\$6.25
Filter Choke—30 Henries—120 Mills.....	\$2.00
Powerizer 180-volt B Eliminator.....	\$8.00
Dubilier 1 1/4 Mfd. High Voltage Filter Condenser Block. D. C.	
Working Voltages 1,000, 600 and 160.....	\$3.75
Samson "PAM" No. 16 Two-Stage Power Amplifier (less tubes).....	\$38.50
Thordarson High-Voltage Power Transformer—250 Watts—for 2-UX-	
250's or 210's, and 2-UX-281 Tubes.....	\$5.75
Thordarson High-Voltage Power Transformer—175 Watts—for 1-UX-	
250 or 210 and 2-UX-281 Tubes.....	\$4.25
RCA Power Transformer, for UY-224 Screen Grid and UX-245 Power	
Tubes. Type 380.....	\$3.75
Kolster—K-5—Electro-Dynamic Speaker, complete with 210 or 250	
Power Amplifier and "B" Supply Unit in Cabinet. List \$175.00	
(less tubes).....	\$26.50
The New Gould Kathanode Unipower 6-Volt Automatic Radio. "A"	
Power, from light socket.....	\$9.75
Dubilier 4 Mfd. High Voltage Filter Condenser. D. C. Working Volt-	
age 600.....	\$1.80
R. C. A. Power Transformer No. 8335 for Radiolas 33, 18 and 17.	
Supplies Plate Filament Voltages for four 226's, one 227, and one	
171-A and 280 tubes.....	\$3.75
R. C. A. Two Stage Audio Transformer Pack, Part No. 5667. For	
Radiolas 33, 18 and 17. Ratio of each Transformer 3-1.....	\$1.90
Aerovox 7 Mfd. High Voltage Filter Condenser Block. D. C. Working	
Voltages 1,000, 800 and 400.....	\$3.25
Jefferson Step-down Transformer, 110 V. to 14 V. at 2 1-2 Amps.....	\$.95
Thordarson Sonora Power Transformer. Supplies plate and filament	
voltages to four 224's, one 227, two 245's and one 280 tubes.....	\$3.75
Thordarson 30 Henry 175 Mill Choke, Model T2030A.....	\$3.25
Bremer-Tully Model 80 Six Tube Battery Operated Console Receiver,	
fully shielded, one dial control. list \$89.50.....	\$24.50
Potter 13 Mfd. High Voltage Filter Condenser Block, D.C. Working	
Voltage 600.....	\$4.25
Powerizer for Radiola 28 and 25, list \$84.00.....	\$21.00
G. E. TB-1 Kenotron Rectifying Tube UX-Base.....	\$.50
Westinghouse Choke Coils, 15 Henrys, 35 Mills.....	\$.45
Western Electric Breast Type Microphone.....	\$1.25
Kolster 6-H 6 Tube Console Receiver with built in Kolster Dynamic	
Speaker, list \$295.00.....	\$42.50

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SERVICEMEN**



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CARDWELL'S BANNER PERFORMANCE

★ THE Star Spangled record of Cardwell Con-
densers stands on a high peak, alone. They
have always been the choice when Performance was
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a condenser was needed that could stand up when
the going was tough! With Byrd over the North
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history over the South Pole—what a record! There
is a Cardwell Condenser for every tube and purpose.
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Fill in and mail this advertisement with 25c (stamps or coin) for 48-page "Hi-Q-30" Manual. Invaluable to radio constructors.

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Name _____

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150 watt 1300 volt center tapped with two 7½ volt windings, \$7.00. 250 watt, 550, 750 volts each side center, two 7½ volt windings, \$10.50. 700 watt 1000, 1500 volts each side center, \$14.50. Special transformers and chokes to order. 4 MF unmounted condensers working voltage 1000, \$3.00. 2 MF 750 volt, 75c. 1 MF 750 volt, 40c. 3 MF 600 volt, 40c. 2 MF, 30c. Power pack repairs and replacements. Send for list.

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PHILADELPHIA, PA.

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A representative for Arizona, Arkansas, Colorado, Nevada, New Mexico, Texas, Delaware, Florida, District of Columbia, Georgia, Illinois, West Virginia and Wisconsin.

One for each of the above states is desired. Write, giving particulars of your ability to cover the territory.

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A Classified Advertising Section Read by Better Buyers

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Radioads for the October Issue Should Reach Us by September Twentieth

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STARTLING INVENTION! SCREW-HOLDING SCREW DRIVERS! Remove, insert screws inaccessible places! Factories, garages, electricians, mechanics buy on sight! Sells \$1.50; exclusive territory. FREE trial! Toolco, 1592 Water St., Boston.

\$1200.00 will buy our RADIO DEPARTMENT stock clean. Atwater Kent and Victor dealers. Easy competition for the right man. We have made money in this department; you can, too. Wonderful opportunity. Radio department operated in conjunction with department store. Radio Salon, Repair Room, new Erskine Truck, \$65.00 month. Write Box 27, Lompoc, Calif.

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SERVICE REPRESENTATION—Repair shop, Cleveland, Ohio, well equipped, expertly manned, wants to represent manufacturers of high-grade electrical equipment. Haletric Laboratory, 1793 Lakeview Road, Cleveland, Ohio.

MISCELLANEOUS

"CITY OF CHICAGO," WORLD DURATION PLANE, 30" Plan 10 cents. Model Aviator Dept. R, 605 Washington, Chicago.

SERVICE MEN ATTENTION—Speakers rewound, magnetized, repaired, \$2.00 to \$2.75. Complete Power Pack Service—Transformers rewound. Condenser blocks repaired, resistors duplicated. Guaranteed. Clark Bros. Radio Co., Albia, Iowa.

AMATEURS-EXPERIMENTERS-BUILDERS—We serve over 4000 IRE, ARRL, etc., experimenters and "nuts." Full discounts. \$50,000.00 stock approved parts—no sets. Over four pounds, catalog, circuits, data, prepaid, 50c. Weekly bulletins (new items, results of experiments, etc.) 20 weeks, \$1.00. Sample experiments "Over the Soldering Iron" magazine, 25c. Transmitting data, price list, etc., 25c. Kladag Radio Laboratories, established 1920, Kent, Ohio.

N. R. I. RADIO COURSE—Late, \$70 complete, 57 lessons with answers, \$15.00. Carl Campe, Center Line, Mich.

"CITY OF CHICAGO," WORLD'S DURATION PLANE, 30". Plan 20c. Model Aviator. Dept. R, 601 Washington, Chicago.

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COMPLETE POWER-PACK SERVICE—Transformers rewound, Condenser blocks repaired. Resistors repaired or duplicated. Specially equipped shop. Work guaranteed. Clark Brothers Radio Co., Albia, Iowa.

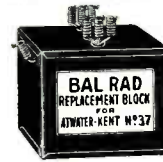
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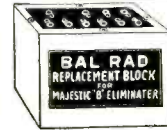
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128 W. Lake St. CHICAGO

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WE Specialize in Replacement Parts



BAL-RAD REPLACEMENT BLOCK
For Atwater Kent No. 37
This unit contains the proper chokes and high voltage condensers. All flexible wire colored leads identical to the original. Fully guaranteed.
\$4.95 ea.



BAL-RAD Replacement Block for Majestic "B" Eliminator
The condensers in this block are composed of high voltage condensers. Guaranteed for 1 year.
\$2.95 ea.



RCA CHOKE COILS

15 Henries
Impregnated in Rosin. Ideal choke for use in "B" Elim. and A.C. Sets. D.C. Resistance 500 ohms.
35c ea.



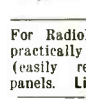
POLYMET Hi-Volt 1 mfd. Filter Condenser.
300 Volts D.C.
35c ea.
\$3.60 per doz.

POLYMET By-Pass Tubular Condenser
1 mfd., 200 volts
Can be used across Choke Terminals in Victor Sets to reduce hum.
\$1.00 per doz.



RCA BY-PASS CONDENSER

Part No. 5996
Comprising one ½ and three ¼ mfd. condensers.
List \$3.00 35c ea.



YAXLEY 2,000-OHM VOLUME CONTROL

For Radiola 17, 18, 32, 42, 44, and practically all sets. Insulating strip (easily removed) for metal panels. List Price \$1.95... 45c ea.



RCA POWER TRANSFORMER

For Radiolas 17-18-32-51
This Shielded Power Transformer can be used to convert your Battery set to an A. C. Set. Will supply all filament and plate voltages up to 7 tubes.
Part No. 8335
Special \$3.95 ea.

BAL-RAD HY VOLTAGE Surge-Proof Condensers For General Repair and Power-Pack Work

We guarantee these condensers for 100 per cent free replacement. Repairmen should carry a few dozen in stock.

	MPD.	Working Volts	Each
One	600	"	30c
Two	600	"	40c
Four	600	"	60c
One-half	300	"	25c



RCA REPLACEMENT 600V CONDENSER BLOCK

For Radiolas 18-33-51
Part No. 8333
Special \$1.50 ea.



Victor 30-Henry Choke
Will Pass 125 Mils.
For replacement in Victor, Edison and Radiola sets.
50c ea.

RCA Double-Filter Chokes

R. C. A. Replacement Part No. 8336. Contains two 30 Mil. Chokes. Each choke insulated for 1000 volts.
\$1.70 ea.



VICTOR PUSH-PULL TRANSFORMER—Input and Output

Can be used with 171A—245 or 250 type tubes. Output matches moving coil on all dynamic speakers.

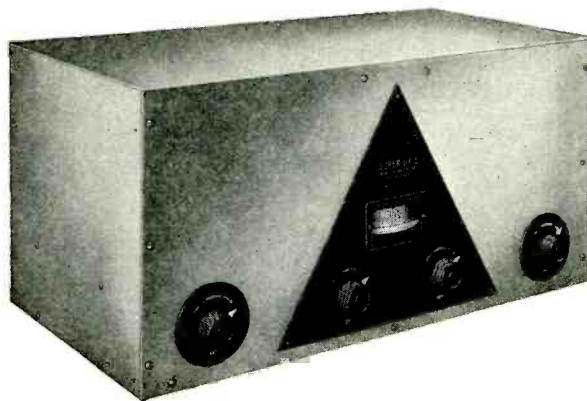
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ENTIRELY NEW
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RELIABLE PERFORMANCE
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Crosley Offers an Amazing *NEW* Electric Phonograph and Radio Combination at a New Low Price

The Crosley *NEW* COMPANIONSHIP SERIES

SCREEN GRID
POWER SPEAKER

NEUTRODYNE
A. C. ELECTRIC

The Crosley *NEW* BUDDY



The hand carved effect shown in The *NEW* BUDDY is, as in all of the *NEW* Companionship Series models, produced by the use of the new and exclusive Crosley Repwood—an entirely different material of ground, long fibre wood combined with a composition which makes it possible to mold Repwood into any shape or form, producing exact duplicates of the most expensive and delightful wood carvings. For the first time such a compact radio receiving set bearing a name which means "quality" is offered. The set

itself is entirely *NEW*. While the chassis is different in physical appearance from that used in The PAL and The MATE, it embodies the same circuit, delivers the same performance and uses the same type tubes. The newest type Crosley electro-magnetic power speaker is incorporated. Dimensions: Only 15 3/4" high, 15 3/4" wide, 9 3/4" deep. Nothing like this wonderful set has ever been offered at the low price of.....

\$64.50

With Tubes

The Crosley PAL



Here is a magnificently beautiful cabinet the front and sides of which are of the new Crosley Repwood. The top is of 5-ply Walnut veneer. Newest type Crosley electro-magnetic power speaker is incorporated. Tubes required are: Two Screen Grid type -24 in the radio frequency stages, one Screen Grid type -24 in the detector stage, one type -45 in the power output stage and one type -80 as a rectifier. Dimensions: Only 25 3/4" high, 21" wide, 11" deep. An astonishing value at.....

\$69.50

Less Tubes

The Crosley MATE



The exquisitely designed front of this beautiful cabinet is made of the famous Crosley Repwood. The substantial posts and stretchers are of the finest 5-ply Walnut veneer. The newest type Crosley electro-magnetic power speaker is built in. Contains the same powerful and wonderfully selective *NEW* Companionship Series chassis as The PAL. Dimensions: 30" high, 29 3/4" wide, 12 1/2" deep. The price is amazingly low—only.....

\$75.00

Less Tubes

The Crosley *NEW* LEADERSHIP SERIES

SCREEN GRID
POWER SPEAKER

NEUTRODYNE
A. C. ELECTRIC

The Crosley DIRECTOR



This handsome cabinet is a masterpiece of harmony and beauty. The sides and top are of genuine 5-ply Walnut veneer. The exquisitely designed center front panels of the new, sensational Crosley Repwood. Has new and astonishingly efficient automatic volume control. The latest type Crosley moving coil dynamic speaker is incorporated. This set requires three Screen Grid tubes type -24; one tube type -27; two type -45, and one rectifier tube type -80. Dimensions: 31 1/4" high, 23 3/4" wide, 13 3/4" deep. The price is sensationally low—only.....

\$107.50

Less Tubes



The *ARBITER*

Electric Phonograph and Radio Combination **\$137.50** LESS TUBES

As an example of the beauty, value, originality and distinction of the *NEW* Crosley line, look at The *CROSLEY ARBITER* shown above. An electric phonograph and radio combination at only \$137.50! A highly sensitive and selective Screen Grid, Neutrodyne, power speaker, A. C. electric receiving set housed in a delightfully designed and executed cabinet—plus—an electric phonograph and pick-up. Never before has such an outstanding value been offered in radio. The beauty of the cabinet is self-evident. The latest type Crosley moving coil dynamic power speaker is used. The automatic volume control maintains a uniform volume all over the dial. The tubes required are: Three Screen Grid type -24, one type -27, two type -45, and one rectifier tube type -80. Dimensions: Only 35" high, 23 3/4" wide, 15" deep. Available with induction type self-starting motor at \$147.50.

Backed with extensive national advertising, this remarkable Crosley line will be the fastest-selling, biggest profit-making line on the market. Get in touch with your Crosley distributor immediately and learn more about this wonderful new line.

THE CROSLEY RADIO CORPORATION
POWEL CROSLEY, JR., President Home of "the Nation's Station"—WLW
CINCINNATI, OHIO

Also manufacturers of CROSLEY Battery Radio Receivers the CROSLEY ROAMING Automobile Radio Receiving Set, and the famous AMRAD RADIO

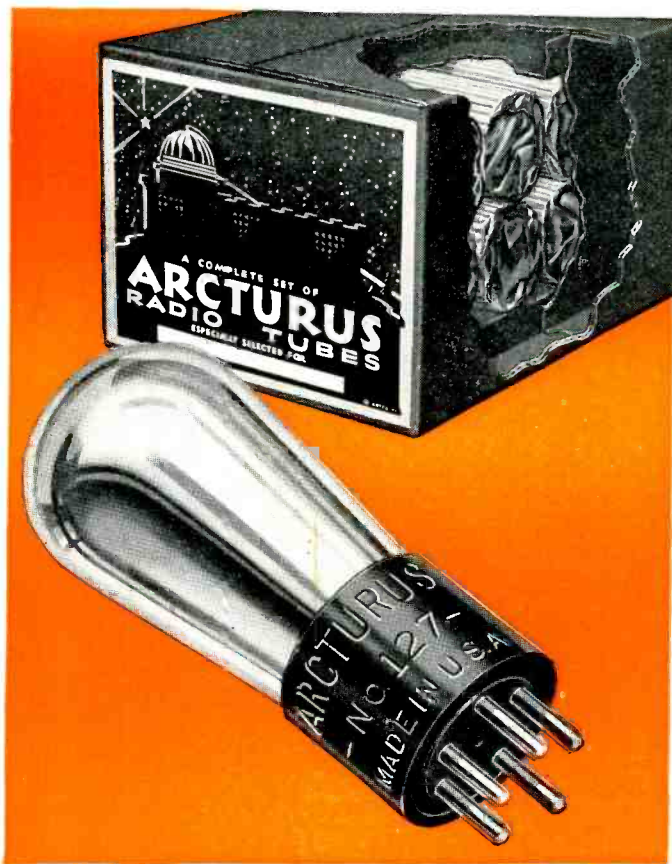
The *CROSLEY ARBITER* Electric Phonograph and Radio Combination is also a member of the Crosley *NEW* Leadership Series.

YOU'RE THERE WITH A CROSLEY
CROSLEY RADIO

Every One Of Your Customers

WILL BE INTERESTED IN THIS ARCTURUS FEATURE

LIFE-LIKE TONE



THIS HANDY CARTON

— A compact, self-contained mailer that requires no re-packing—contains a complete set of Arcturus Blue Tubes ready for delivery with any radio receiver. The kits are easily identified by the black and blue design, similar to the well-known Arcturus Tube Carton. Ask your jobber for the details of the attractive Arcturus plan.

WHAT do your customers expect from a radio set? *Natural, Life-Like reproduction!*

That's the feature you emphasize when you're demonstrating a set; that's the kind of reception every buyer expects.

On the tubes you use depends the final success of your demonstration and sale. Tubes are the crux of the whole situation.

Now Arcturus gives you, in the new air-cushioned package, a set of Arcturus Tubes especially selected for the designated receiver. With a complete set of Arcturus Blue Tubes in a radio, you know you'll get unusually clear, brilliant programs, and you know that they will keep the set sold.

The advanced design of Arcturus Tubes eliminates mechanical background noises—every note, every word, comes in with a vivid *Life-Like Tone*. Satisfying performance is assured—and in addition the 7-second action that has made Arcturus Blue Tubes famous.

And with this "radio insurance", this new Kit offers you the most profitable merchandising idea in the industry.

Your Jobber has a most attractive profit story for you. Get the details today. Arcturus Radio Tube Company, Newark, N. J.

TRY THIS TEST—Next time you replace a complete set of tubes for one of your customers, put in Arcturus Tubes. Let the radio owner be the judge. He will instantly appreciate the quick 7-second action, and the improved reception, the clearer reproduction, made possible by Arcturus Life-Like Tone.

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for every
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