

radio service dealer



**February
1946**

**IN THIS ISSUE—
BILLIONS IN DEALER SALES
Private Aircraft Radio
A System For Your Service Bench
More 1946 Radio Service Data**

IN PRODUCTION



**the safer
no-burn heater
most people
prefer**



NATIONALLY ADVERTISED IN



WITTIE
PORTABLE
ELECTRIC *Steam* HEATER



YOU'VE never seen a heater like this! Wittie Portable Electric Heater provides *real STEAM heat* . . . quickly and economically. Not just "fire-place" heat . . . but uniform warmth that's air-circulated to every corner of the room. Wittie is safer and cleaner, because it has no exposed glowing coils to cause fire or burn. In light-weight luggage design—handsome as a piece of furniture.

SPECIFICATIONS: 21½ x 17 x 7¼ inches; automatic safety shut-off; 2-stage heat regulator; operates on AC current; three attractive colors; in "Fan-Blow" or Convection models to suit individual needs.

Established 1932. Wittie's War Role—designing, engineering, and building ventilating equipment used in tanks, planes, and ambulances.

WITTIE MFG. & SALES CO. General Offices and Plant: 1414 S. Wabash Ave., Chicago 5, Ill.
Branch Offices and Representatives in New York, Kansas City, Los Angeles, and Detroit.

NEW!



First "Mini-Max" "A-B" Pack for Portables!

WHAT YOU SEE in this picture is the new "Eveready" No. 754 "A-B" pack for portable radios. A pack delivering 90 volts plate supply; 7½-9 volts filament supply.

WHAT YOU DON'T SEE is the construction of the "B" section of the unit—a construction that's newsworthy indeed! For this is the *first* time that the famous, longer-lasting *flat-cell* principle of the "Mini-Max" battery has been available in an "A-B" pack for portable receivers.

Because no space is wasted in the "Mini-Max" battery, more electro-chemical energy is packed into every cubic inch. Which means that this new battery—like every "Mini-Max" battery ever built—lasts far longer than any competitive battery of equal size.

YOUR REPLACEMENT PROBLEMS ARE SIMPLIFIED because new portable receivers are now being designed around this pack—and it fits many present models as well.



The registered trade-marks "Eveready" and "Mini-Max" distinguish products of National Carbon Company, Inc.

NATIONAL CARBON COMPANY, INC.

Unit of Union Carbide and Carbon Corporation

General Offices:

30 East 42nd Street, New York 17, N. Y.

Division Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco



● An example of "Eveready" "Mini-Max" battery advertising is this full-page advertisement in *Life*, *Time*, *Saturday Evening Post*, *Collier's*, *Look*, *American Magazine*, and dozens of other magazines. It dramatizes "Mini-Max" battery advantages to your prospects—helps you *sell* "Mini-Max" batteries.

SYLVANIA NEWS

RADIO SERVICE EDITION

FEB. Published by SYLVANIA ELECTRIC PRODUCTS INC., Emporium, Pa. 1946

**SYLVANIA
SERVICEMAN
SERVICE**

by
FRANK FAX



NEWS OF VALUABLE TECHNICAL AIDS FOR SERVICEMEN

Because of the many ways that Sylvania Electric is able to—and does—help the radio serviceman, you will find that handling Sylvania tubes means *extra* profits for you.

For instance, there is a long list of business and technical aids, compiled specially for you by experts in their fields. Included in this valuable material are two of the latest Sylvania technical helps, the SYLVANIA RADIO TUBES CHARACTERISTICS booklet and the SYLVANIA BASE CHART.

Make sure you have these up-to-the-minute aids to better servicing. They will give you accurate characteristics and base diagrams for all the Sylvania Electric radio receiving tubes. Give your customers the most satisfactory service. Feature the famous Sylvania line of radio tubes. That deal is the best deal for you.

Obtain your copies of the aids shown at the right from your Sylvania distributor, or write directly to me at Sylvania Electric, Emporium, Pa.

**LATEST REVISED TUBE
CHARACTERISTICS BOOKLET**



Now!
get these valuable
technical
aids -

**HANDY "PIN-UP"
SYLVANIA BASE CHART**

SYLVANIA ELECTRIC

Emporium, Pa.

MAKERS OF RADIO TUBES; CATHODE RAY TUBES; ELECTRONIC DEVICES; FLUORESCENT LAMPS, FIXTURES, WIRING DEVICES; ELECTRIC LIGHT BULBS

radio service dealer

Member Audit Bureau of Circulations

Covers all phases of radio,
phonograph, sound and elec-
trical appliance mer-
chandising and servicing

VOLUME 7 NUMBER 2

FEBRUARY, 1946

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Cover: Servicing of communications
and DF private plane radio receiver.
(Courtesy of Pan-American World
Airways.)

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COWAN PUBLISHING CORP.

SANFORD R. COWAN,
Publisher

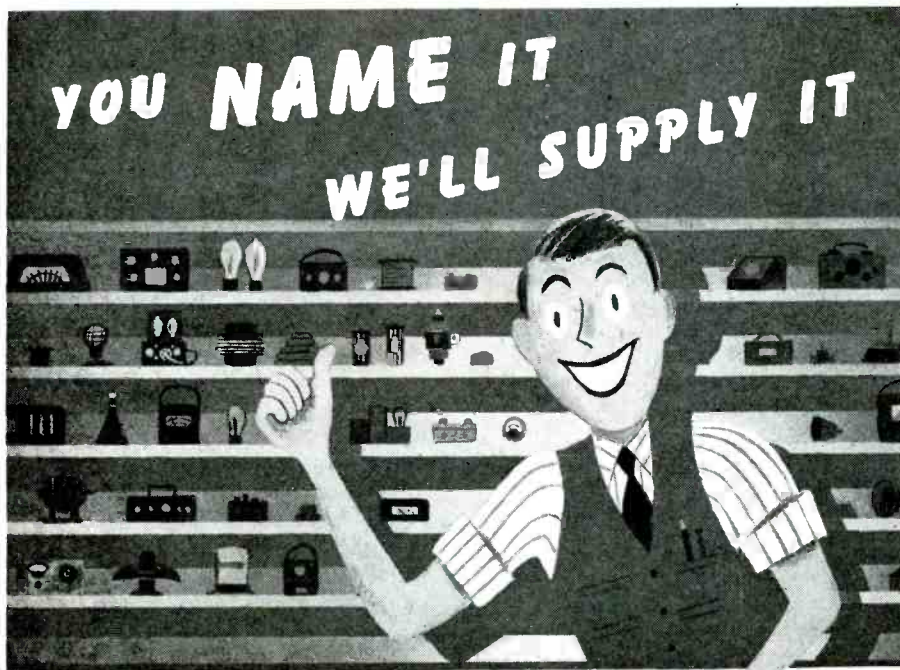
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EVERYTHING IN RADIO AND ELECTRONICS

R. W. T., world's oldest and largest Radio Supply House, is ready again with tremendous stocks of sets, parts and equipment. You can depend on our quarter-century reputation for quality, sound values and super-speed service. Orders shipped out same day received. All standard lines already here or on the way, including: National, Hammarlund, R. C. A., Hallicrafters, Bud, Cardwell, Bliley and all the others you know so well.

Radio Wire Television Inc.

100 Avenue of the Americas, New York 13 • Boston, Mass. • Newark, N. J.

ORIGINATORS AND MARKETERS OF THE FAMOUS *Lafayette Radio*



R.W.T. DEPT. 586, 100 AVENUE OF THE AMERICAS,
NEW YORK 13, N. Y.

I want your big new post-war Catalogue.

NAME _____

ADDRESS _____

HAM? (CALL LETTERS) _____

ENGINEER? SERVICEMAN? STUDENT?

"What about this
that Westinghouse



PLENTI-POWER

Radio is advertising?"

Plenti-Power is a brand new radio circuit. It gives a low-priced Westinghouse 7-tube set more crystal-clear, undistorted power output than most 12-tube sets had prewar!

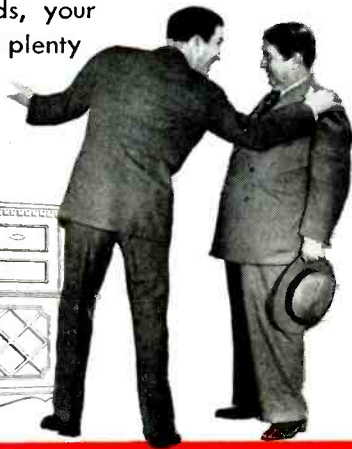
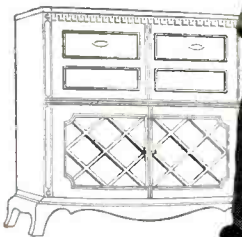


Why all the power? I'm not buying a set because it's loud.

Of course you're not—no more than you drive your car 90 miles an hour. But you do like the fire-ball pep and getaway you get from a 90-mile-an-hour engine! Right?

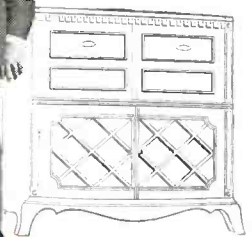


It's the same with a radio. If you want brilliant, true-to-life reproduction of your radio programs and records, your radio has got to have plenty of reserve power.



And they used to add more tubes to get more power?

Right . . . and that cost money. But today with Plenti-Power you can have real 12-tube concert-hall reproduction in a modestly priced 7-tube Westinghouse.

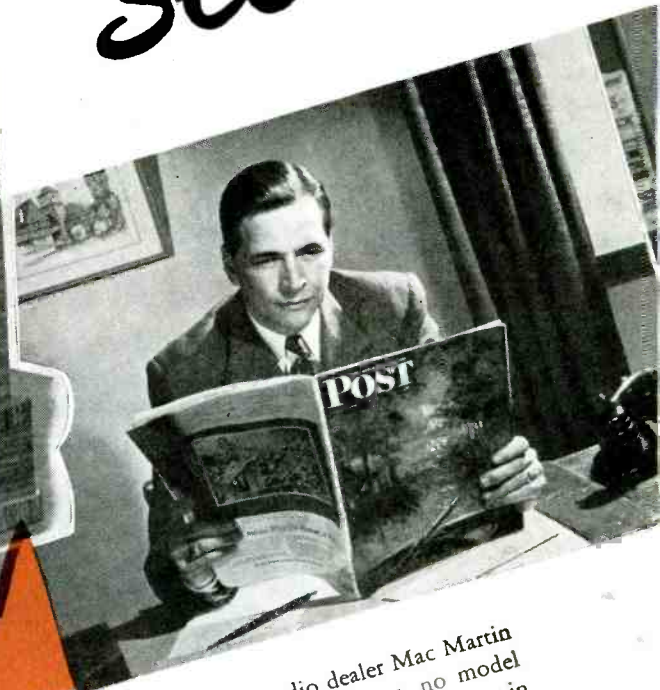
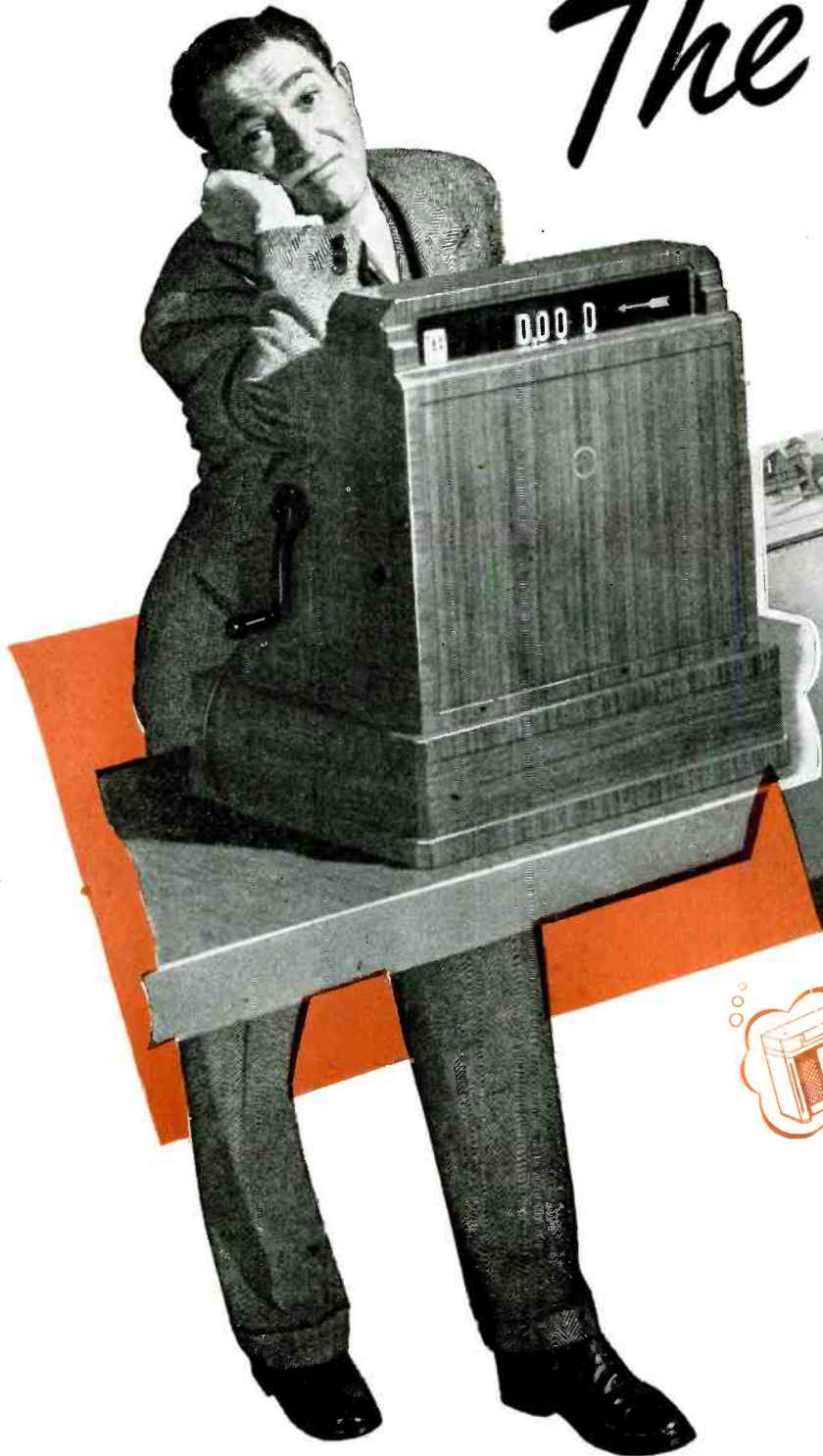



PLENTI-POWER MEANS SALES TO THE MILLIONS WHO WANT 12-TUBE PERFORMANCE ON A 7-TUBE BUDGET . . . IT'S SALES POWER FOR YOU!

Seriously—there's no kidding about the Sales Power you'll have in Westinghouse Plenti-Power. It doesn't take an expert to hear the difference! Anyone can hear it—and everybody likes it. It's one of the features that makes it easy for you to convince your customers that the 1946 Westinghouse Radio is completely new—not a "warmed over" prewar set. Home Radio Division, Westinghouse Electric Corporation, Sunbury, Penna.

Radio's first name is **Westinghouse**
RADIO TELEVISION

The dealer see the



 **All day long**, radio dealer Mac Martin kept saying "No . . . sorry, no model like that . . . no . . . not yet . . . none in that style . . . no," and there didn't seem to be any end to it. Yet the manufacturer continued to keep customers sold on his brand name by advertising in the Post. (Survey after survey shows that people LIKE to read advertising in the Post —far more than in any other magazine.)

who could
end of his "NOs"



Mac may be worried because the demand today outruns the radio supply. But he's meeting more people and making more friends than ever before . . . selling more service jobs, more records and related items . . . and they're Post-advertised, too. (Dealers featuring national brands have long known that Post readers form the nucleus of their most profitable and stable customers.)



What's more, when Mac does get to the end of his no's . . . when the supply of radios catches up with the demand . . . his brand will be on the minds of many good customers. If any dealer's business flourishes then, it will be Mac's. (A recent national survey showed that 1 in every 3 Saturday Evening Post families expect to buy a new radio at an average price of \$150.)

**IT PAYS TO
HAVE THE POST
PAVE THE WAY**

THE SATURDAY EVENING
POST



with the publisher.....

New Competition

MANY men recently given their honorable discharge papers have decided to make radio appliance selling and servicing their life-time profession. Thousands are enrolled in training schools taking Government paid-for technical courses to that end. Latest statistics issued by various government bureaus show that only a very few ex-GIs have been

able to get into this business as yet. The reasons are simple: Stores and merchandise cannot be obtained. Established service dealers have an overwhelming edge in that they have good store locations and besides they have built up a huge backlog of orders which most suppliers plan to fill before taking on new customers. Nevertheless, in time there will be a tremendous influx of competitors. Plan accordingly.

Thumbs Down on Service Association

DURING the past 90 days over 15,000 leading radio-appliance service dealers have been polled to ascertain whether or not they want to have some type of National Association. Results: 73% are against formation of such a National body; 6% desire one; 31% are indifferent or non-committal.

As for localized Associations, here are the figures:

86% for good strong local groups; 12% against and 2% indifferent. Analysis of the participants' opinions indicates that in general it is believed that as business conditions vary so greatly in different parts of the country it is presumed that while strong, localized Associations can accomplish much good in their respective communities, the interlinking into a National body of many such small groups would not accomplish more for industry betterment than can the locals.

Production Still Snafu

RADIO helped win the war. The industry made many sacrifices, most of which were offset by knowledge gained, and this ultimately will result in the public benefit. That is, it will if our Government permits the radio industry to survive. Right now Washington is literally forcing the industry out of business. Of course, one can get some satisfaction from the knowledge that other industries are also being stupidly oppressed too.

Tens of millions of dollar in wages which should be flowing daily into the pockets of consumers is dammed up by industrial strife and inactivity. Wartime-earned savings, expected to bring an era of prosperity, are being dissipated to buy the barest essentials. Within a short time our "badly advised president", as the N. Y. Times refers to Mr. Truman, will undoubtedly correct the situation. Then the manufacturers will be allowed to price their products at legitimate profit-earning levels and production will resume.

Surplus—Junk Is Available

REPLACEMENT radio and appliance parts, and some tube types not obtainable during the war, are now making appearance. But there's a catch—for much of it is so-called "surplus or military reject," generally sold "as is." A lot of it is just plain junk, even though unused and packaged in the original cartons.

Before buying any of this type of merchandise, Service Dealers should be particularly cautious,

test it carefully and whenever possible demand a warranty. The few cents sometimes saved by buying unguaranteed parts does not offset the risk involved in using it. Stick to fresh merchandise made by reputable manufacturers. It pays.

S. R. Lowan
Publisher

Radio AS YOU NEVER HEARD

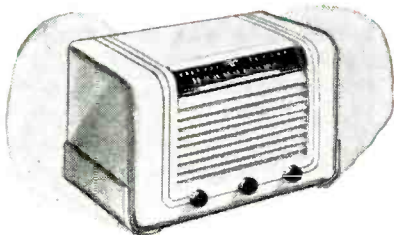
IT BEFORE—WITH

Strobo-Sonic TONE



IT'S PICTURE-CLEAR!

Here is tone so faithful you can understand each word, distinguish every instrument, hear music in its true dimensions . . . Strobo-Sonic Tone that's picture-clear!



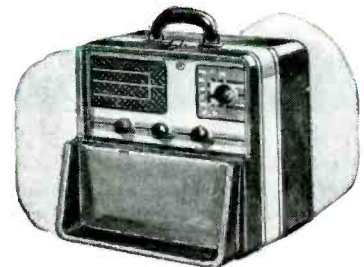
PLASTIC TABLE MODEL

Never before has a set this size offered so much! AC-DC, 6 tubes*, straight-line dial. The peak of small-set efficiency! In beautiful modern plastic, ivory or mahogany.



2-BAND TABLE SET

With a difference you can *hear!* AC-DC, international and police bands, transverse dial, stepped-up power, 6 tubes*. Handsome walnut cabinet of smart modern design, with chromium grille.



NEW 3-PLAY PORTABLE

Has safe, *dry* batteries that last 7 to 10 times normal! Plays on batteries, AC or DC. Recharges overnight with either AC or DC—with automatic stop. Three attractive color choices.



CONSOLE COMBINATION

All the new Stewart-Warner features including the finger-tip record changer. Beautiful walnut or mahogany.

*Including rectifiers.

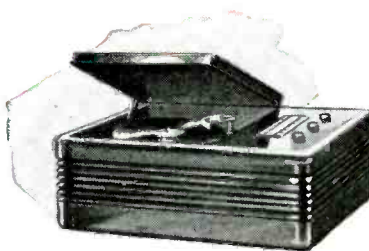


TABLE RADIO-PHONOGRAPH

Tone you'd expect only in the big console! Finger-tip record changer plays up to 12 records. All the undistorted volume you need for dancing. Police band. Sensitive, powerful reception. The *right* combination for today!

YOU CAN DEPEND ON

Stewart-Warner Radios

RADIO-PHONOGRAPHS
CHICAGO 14, ILLINOIS



In & Around the Trade

Being a condensed digest of production, distribution and merchandising activities in the radio and appliance trade.



First postwar radio to come off the Farnsworth Television & Radio Corp. line at Marion is previewed by (l. to r.): R. C. Jenkins, production manager; J. P. Rogers, vice president and treasurer in charge of manufacturing; Mr. Norris, line foreman. The company is producing only limited numbers of these six-tube table models, but more are promised as soon as supply conditions settle down.

RADIO SHOWS

Plans for the parts industry trade show at the Stevens Hotel, May 13-16, were approved and the Board also adopted a policy regarding exhibitions in national and local public shows. Participation in such public shows will be left to the discretion of each individual RMA member, but the Association will not sponsor or endorse any such public radio shows, although it is a sponsor of the parts show.



J. David Cathcart
newly appointed advertising manager
of RCA-Victor Home Instrument Div.

Arrangements for the annual RMA membership meeting and convention on June 12 and 13 at the Stevens Hotel, Chicago, also were approved, including an industry banquet on Thursday evening, June 13. A convention committee with Director A. S. Wells of Chicago as chairman, and with Director J. J. Kahn and Treasurer Leslie F. Muter was appointed by President Cosgrove. All radio exhibits will be prohibited during the RMA annual convention and Association members will be requested not to hold jobber-dealer meetings.

An all time high record RMA membership was attained when applications of 35 new members were approved by the Board at the Chicago meeting. This brought the RMA membership to a peak record of 307, compared with a low of 104 during the 1939-1940 depression period.

A new proposal for uniform industry vacation period, to avoid staggered summer vacations and production losses, was proposed by the Parts Division. This would provide for a general employee vacation covering the week of July 4. The question of a

uniform vacation week will be considered by other RMA divisions, to develop an agreement on a preferred uniform week.

Enlargement of the RMA Board of Directors, with additional representation of the Set, Parts, and possibly other Divisions, was considered, and formal action is planned at the next meeting of the Board, for submission to the Association's membership at its annual June meeting.

Chairman Lee McCanne of the Amplifier & Sound Equipment Division also reported on its new organization, including five sectional groups and special projects of each group. He also submitted a report of the School Equipment Committee, which is promoting radio in schools and other public institutions in cooperation with the U. S. Office of Education and other organizations. Another meeting is planned in Cleveland Feb. 13-14.

57 Newcomers Get Set Prices

Almost two-thirds of the companies which have obtained radio set prices to date are newcomers in the field, not having produced before the war, an RMA analysis of OPA prices listed through the week of January 18 discloses.

A total of 93 companies, including three mail order houses, have obtained prices on 352 sets, and of the 90 manufacturers only 33 were in production before the war or listed in the WPB order of April 22, 1942, ending civilian radio production. This means 57 are new in the radio set production field.

OPA officials have no record of how many of the applicants who have been given set prices are in production or expect to start producing, but they expressed the belief that many of the newcomers, probably as many as half, decided not to produce at this time after getting their prices. The reason for such a decision, OPA officials believe, was that prices were too low to make production profitable during a period of short supplies.

Some of the new applicants began radio production during the war, and others have formed organizations since V-J Day for postwar production. Some of the new companies, it is understood, include former retailers and jobbers in their executive personnel.

Radio Services Expand

The FCC is preparing for expansions in various radio services, some of which were non-existent or in an experimental stage before the war, records of House hearings on its budgetary requests reveal. Among the forecasts made by FCC witnesses are:

1. *Citizens' Communications Service*: The FCC expects 200,000 sets of

the light walkie-talkie type to be in operation by next year. Rules governing this new service will be ready in February or March.

2. *Mobile services*: Indications are that 11,000 stations may be in use by bus, truck, ambulances and taxicab companies by July, 1947. Services will be divided into urban mobile and highway mobile units.

3. *Railroad radio*: Railroad radio communications installations are expected to jump from 125 as of July 1, 1945, to 2,200 by July 1, 1946, and to 3,300 by July 1, 1947.

4. *Aircraft radio*: Radio-equipped aircraft expected to rise from 2,090 as of July 1, 1945, to 10,265 by July 1, 1946, and to 26,688 by July 1, 1947, with 2,500 ground stations licensed by the latter date.

Television Allocations

The Federal Communications Commission has issued its long awaited report on allocation of the 13 commercial television channels, which provide for over 400 television stations in the nation's first 140 markets.

The Commission's allocations are virtually identical with those recommended by TBA, from the standpoint of number of channels per city, although variations have been made in the channel assignments. While not barring the use of directional antennas, the Commission favors limited power community stations over directional antenna installations. These community channels are not limited to Channels 1, 11, 12 and 13 as the FCC originally planned, but can be situated on any one of the 13 channels where they are needed to prevent interference with higher powered stations. New York, Chicago and Los Angeles get 7 stations each, while communities like New Haven, Wilmington, Trenton, Atlantic City and Lancaster can also have video stations.

CHANNEL ASSIGNMENTS (For Leading Metropolitan Areas)

CHANNELS

New York City...2, 4, 5, 7, 9, 11, 13
 Chicago2, 4, 5, 7, 9, 11, 13
 Los Angeles....2, 4, 5, 7, 9, 11, 13
 Philadelphia ...3, 6, 10, 12
 Boston2, 4, 7, 9, 13
 San Francisco...2, 4, 5, 7, 9, 11
 Pittsburgh3, 6, 8, 10

RMA to Report on Radio Industry

The Radio Manufacturers Association, representing the majority of the parts and sets manufacturers of the radio industry, will make a report to the OPA of the status of the in-

[see page 12]

Wait for these new

HICKOK

Radio Service Instruments



Model 532
Tube Tester



Model 534
All Purpose Tube and Set Tester



Model 203
Electronic Volt-Ohm Capacity Millimeter

If It Isn't A Hickok Indicating
Micromhos It's Not
Dynamic Mutual Conductance

Your patience in waiting for these new 1946 HICKOK models will be richly rewarded for these new HICKOK tube and set testers make still closer tests, with finer accuracy, rejecting tubes that might get by with an ordinary tester.

Now you have 7 selector switches instead of 2. That aims to prevent obsolescence. Isn't that worth waiting for?

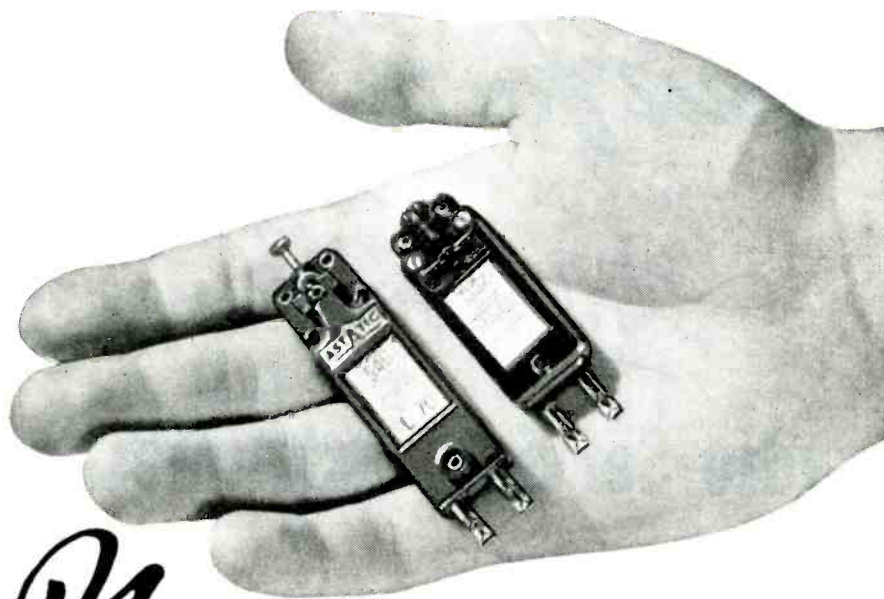
What's more, Dynamic Mutual Conductance, indicated in Micromhos, is a duplicate of the manufacturer's method of checking when he makes the tubes. Remember, if it isn't a HICKOK Indicating Micromhos, it isn't Dynamic Mutual Conductance.

The new Electronic Volt-Ohm-Capacity Milliammeter Model 203 reads as low as 1.0 mmf and up. It will measure at frequencies to over 10 mc with no frequency error and the ohm meter will measure up to 10,000 megohms.

Keep patiently in touch with your jobber and you will soon get the instruments that are held in highest esteem.

**THE HICKOK
ELECTRICAL
INSTRUMENT CO.**

10533 Dupont Avenue
Cleveland 8, Ohio



New Astatic Cartridges

Improve Phonograph Reproduction

INTENDED for use with both automatic record changers and manually operated equipment, these new Astatic Cartridges, in MLP and L-70 Series, assure a degree of fidelity heretofore unparalleled in the reproduction of recorded sound. All new Astatic Phonograph Pickup Arms will include these finer Cartridges.

L-70 Series Cartridges are of the replaceable needle type, are designed with streamlined housing, high output voltage and low needle pressure.

MLP Series Cartridges are of the permanent or fixed stylus type and are engineered to operate at one-ounce pressure, with increased vertical compliance, higher output voltage and reduced needle talk.

*"You'll HEAR MORE
from Astatic"*

• Astatic Crystal Devices
manufactured under Brush
Development Co. patents.

THE Astatic

CORPORATION

CONNEAUT, OHIO

IN CANADA. CANADIAN ASTATIC LTD., TORONTO, ONTARIO

In Trade

[from page 11]

dustry within the next few weeks, it was announced today by A. S. Wells, chairman of the RMA committee on industry production problems. The purpose of the report, first of its kind ever made by the industry, will be to present to the OPA and the public a complete picture of the chaotic conditions which now exist in the industry. Mr. Wells said.

"We are not approaching the OPA in any combative spirit, nor to make any dogmatic demands," Wells said. "We are convinced that neither the OPA, the public, nor the Congress—in fact no one except the manufacturers of parts and sets who are attempting to fill the pent-up demand for radios—realize the difficulties we are facing in the radio industry. We believe the plain, unvarnished truth of our experiences since V-J Day will be revealing."

Although no definite date has been requested as yet for an OPA hearing, Mr. Wells stated that efforts soon will be made to obtain such a date to present the radio industry's case to Chester A. Bowles, OPA administrator, and his associates.

Release Sample Cleaners

It is announced by Mr. C. A. Thompson, Premier Sales Manager, (General Electric Co.) that sample Premier cleaners were released to 16,000 dealers on January 30, 1946. All Premier distributors were notified by wires on that date to release all sample Premier cleaners to their dealers as a follow-through on Premier's previously established policy of "One to every dealer before any one gets two!"

Radio Club Gets Talk On Projection Television

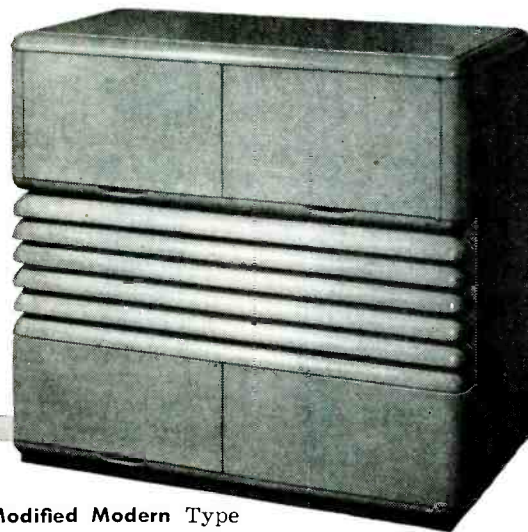
Ioury G. Maloff, who supervised the development of RCA's reflective optical projection system for television receivers, which makes possible large, brilliant images on a home receiver screen approximately the size of a newspaper, was the principal speaker at a recent meeting of the Radio Club of America, held at Havemeyer Hall, Columbia University, New York.

Mr. Maloff, who is engaged in advanced television development at the RCA Victor Division, Camden, N. J., told how the design, manufacturing, installation, and servicing have been improved and simplified to a point

[see page 14]



Early American Type Automatic—
Complete with FM



Modified Modern Type
Automatic—Complete with FM

Hit of the Chicago Show!

Thanks fellows! You said some mighty complimentary things about the new Sparton postwar line of radios and radio-phonographs.

You liked the styling. You raved about the tone.

No question about it! These sensational new Spartons offer real merchandising pos-

sibilities. They are *plus-value radios* in every sense of the term.

If you are interested in being the exclusive* Sparton dealer in your community and in receiving shipments on a direct factory-to-dealer basis, write Ed Bonia, Sales Manager, The Sparks-Withington Company, Jackson, Michigan.

THE SPARKS-WITHINGTON COMPANY, JACKSON, MICHIGAN

SPARTON

RADIO'S RICHEST VOICE SINCE 1926

*All Sparton Radios are sold under the SCMP (Sparton Cooperative Merchandising Plan) to one dealer in each community.



Compact Automatic
Radio-Phonograph
for small homes
and apartments



Medium Priced
Automatic Radio-
Phonograph with
Tilt Front



All Under One Roof

WE manufacture over 25 different lines for the Radio service trade and are prepared to ship

- JFD "SOCKETTE" RADIO TUBE ADAPTERS
- JFD EXACT DUPLICATE BALLAST TUBES
- JFD PHOSPHOR BRONZE DIAL CABLE
- JFD BATTERY ADAPTER HARNESES
- JFD ADJUSTABLE BALLAST TUBES
- JFD RESISTANCE CORD ADAPTERS
- JFD PHONO ADAPTER SWITCHES
- JFD MICROPHONE CONNECTORS
- JFD MIDGET JACKS & PLUGS
- JFD PHONOGRAPH NEEDLES
- JFD RESISTANCE CORDS
- JFD AC SERVICE CORDS
- JFD TOGGLE SWITCHES
- JFD AUTO CONDENSERS
- JFD SPEAKER CEMENT
- JFD ANTENNA LOOPS
- JFD AUTO ANTENNAS
- JFD BATTERY PLUGS
- JFD TUBE SHIELDS
- JFD RADIO WIRE
- JFD SUPPRESSORS
- JFD DIAL BELTS
- JFD DIAL CORD

WRITE FOR LITERATURE ON ANY OF THESE UNEXCELLED PRODUCTS

Serving the radio trade since 1929

J.F.D. MANUFACTURING CO. 4111 FT. HAMILTON PARKWAY
BROOKLYN 19, N. Y.



UNIMETER

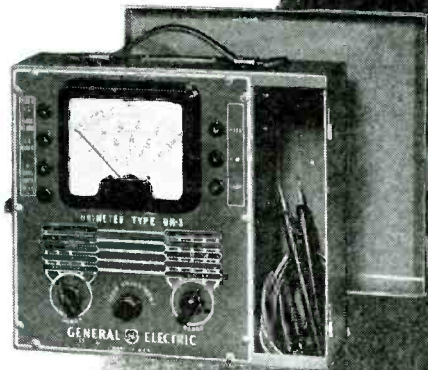
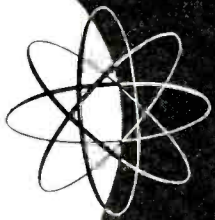
This unit fulfills an extremely important need for general utility portable service equipment. It has wide range coverage for both a-c and d-c measurements of voltage, current measurements on d-c and the popular ranges on resistance.

The UM-3 is designed to clearly indicate all the functions which aid in the prevention of application of high voltages when preparing for current or resistance measurements

Other G-E units for better servicing include: Tube Checker TC-3, Unimeter UM-4, and Oscilloscope CRO-3A.

For details write: *Electronics Dept., Specialty Division, General Electric Company, Syracuse, New York.*

Electronic Measuring Instruments



GENERAL ELECTRIC UM-3

In Trade

[from page 12]

where this system can be considered a proven tool of television technique.

The talk by Mr. Maloff was supplemented by a television demonstration in Havemeyer Hall. Four Victor receivers, two being the large-screen projection type, were set up, and portions of NBC's regular Friday night television program were shown.

RKO Television Elects Austrian President

Ralph B. Austrian is elected president of RKO Television Corporation, succeeding Frederic Ullman, Jr. Mr. Ullman's duties as president of the greatly enlarged RKO-Pathe, Inc., are demanding practically all of his time. He will continue to serve, however, as a director of RKO Television Corporation.

Increase in Speaker Prices

A new increase factor for radio speakers was recalculated on the basis of more complete data obtained from major producers. The new factor is 19.6% over 1941 prices. The formerly announced factor was 13.5. During the next few months, until May 1, 1946, maximum prices for parts which the manufacturer computes by comparing them with frozen priced parts will be automatically approved when the manufacturer files his report of the price with OPA. This temporarily replaces a 30-day waiting period for these prices. OPA may later give the manufacturer a 10 day notice of a new price if OPA finds that the manufacturer's reported price was out of line. This new price will not affect deliveries previously made. (Amendment 37 to MPR 136 — effective January 15, 1946.)

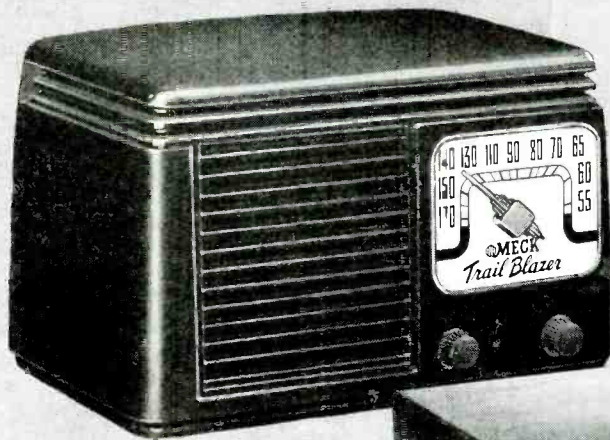
Westinghouse Appointments

Roger H. Bolin, manager of advertising for the Westinghouse Electric Appliance Division, Mansfield, Ohio, announces five appointments in his department as the initial move in preparing for the intensified advertising, sales training and promotion programs planned for the full line of home appliances. The appointments are:

J. R. Clemens, assistant manager of appliance advertising, who will handle the responsibility of product advertising, promotion and sales training. P. W. Endriss, assistant manager of appliance advertising, who will handle

[see page 16]

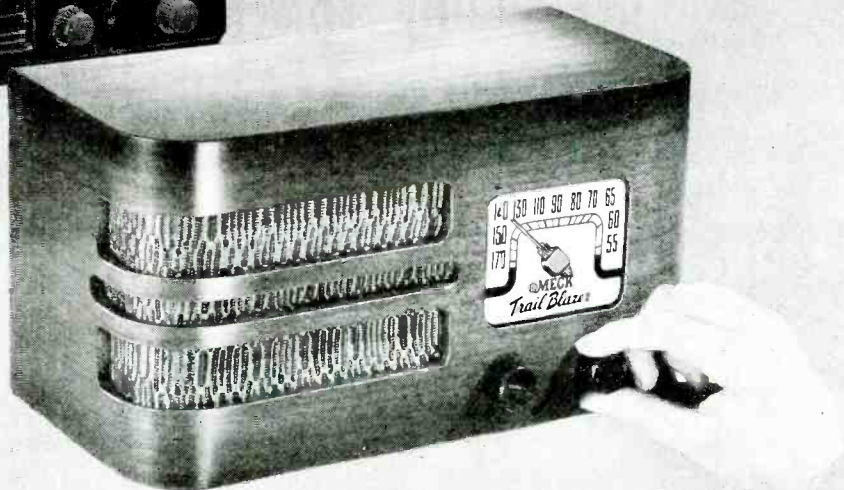
Meck Trail Blazers



Model No. 5C5-PB12



Model No. 5C5-P12



Model No. 5C5-DW9

Forerunners of the Meck complete line, these Trail Blazers are proving the superiority of Meck performance—the popularity of Meck Design. They are the logical choice of the independent dealer because of his appreciation of

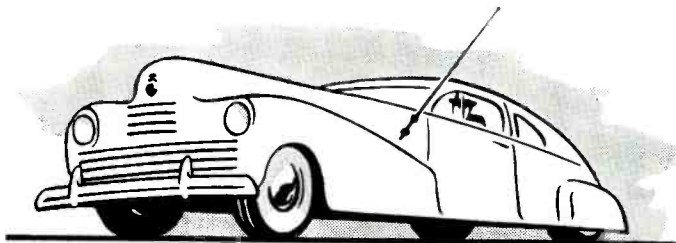
the value of sound radio engineering and because of the exclusive Meck Dealer Policy. The dominating theme of Meck national advertising will continue to be “Buy from the man who knows radio best—your *radio dealer*.”

 **MECK RADIOS**
JMI Sales Corporation, 35 E. Wacker Drive • Chicago 1, Ill.

Where lasting appearance
counts . . .

SNYDER

Antennas



SNYDER
MANUFACTURING COMPANY

PHILADELPHIA

MANUFACTURERS . . . START TO FINISH

SpeedWay

No. 69, 1/2" drill
\$9.95

897 1/2" drill
\$32.50

SpeedWay announces that an even better and more complete line of SpeedWay Electric Tools will soon be available to you at the same attractive pre-war SpeedWay prices. Already coming off the line, these are tools worth waiting for. Ask your dealer about them NOW!

SPEEDWAY MFG. CO.
1857 S. 52nd Ave.
Cicero 50, Ill.

In Trade

[from page 14]

full line advertising programs, consumer education and the advertising and promotion of insecticide dispensers. E. J. Hegarty, manager of sales training, with responsibility for the development, production and testing of wholesale and retail sales training plans. K. A. Donelson, operation manager, who will be responsible for budgets, administering the Westinghouse cooperative advertising, and who will act as office manager of the advertising department. J. G. Baird, sales promotion manager, who will be responsible for full line sales promotional activities for department and furniture stores, and who will continue in charge of the Westinghouse store modernization activities, exhibit and convention work, and consumer film programs.

News At Clarostat

New officers and directors have just been elected to handle the growing activities of Clarostat Mfg. Co., Inc., Brooklyn, N. Y., following the retirement of the three Mucher Brothers who founded the company a quarter-century ago. The company has filed an application with the Securities & Exchange Commission for the issuance of stock to the general public in order to refinance itself on a scale commensurate with the expansion required to meet the post-war radio-electronic demands. The company manufactures resistors, controls and resistance devices now found in all kinds of radio and electrical assemblies.

Heretofore General Manager Victor Mucher is now President; George Mucher, in addition to holding the post of Chief Engineer which he has held for many years past, is Vice-President; William Mucher is the Treasurer; and Charles Burnell who has long handled the legal, patent and labor-relations activities of the company, is Secretary. These Muchers are the younger generation of the family of the founders and have grown up in the business. The new directors are the officers, together with B. G. Cantor, a New York financier.

National Radio

S. W. Bateman of the National Company of Malden announces that agreements have been made with more than 400 distributors for the sale of National Radio Receivers and parts in the United States. Production of receivers,

[see page 50]

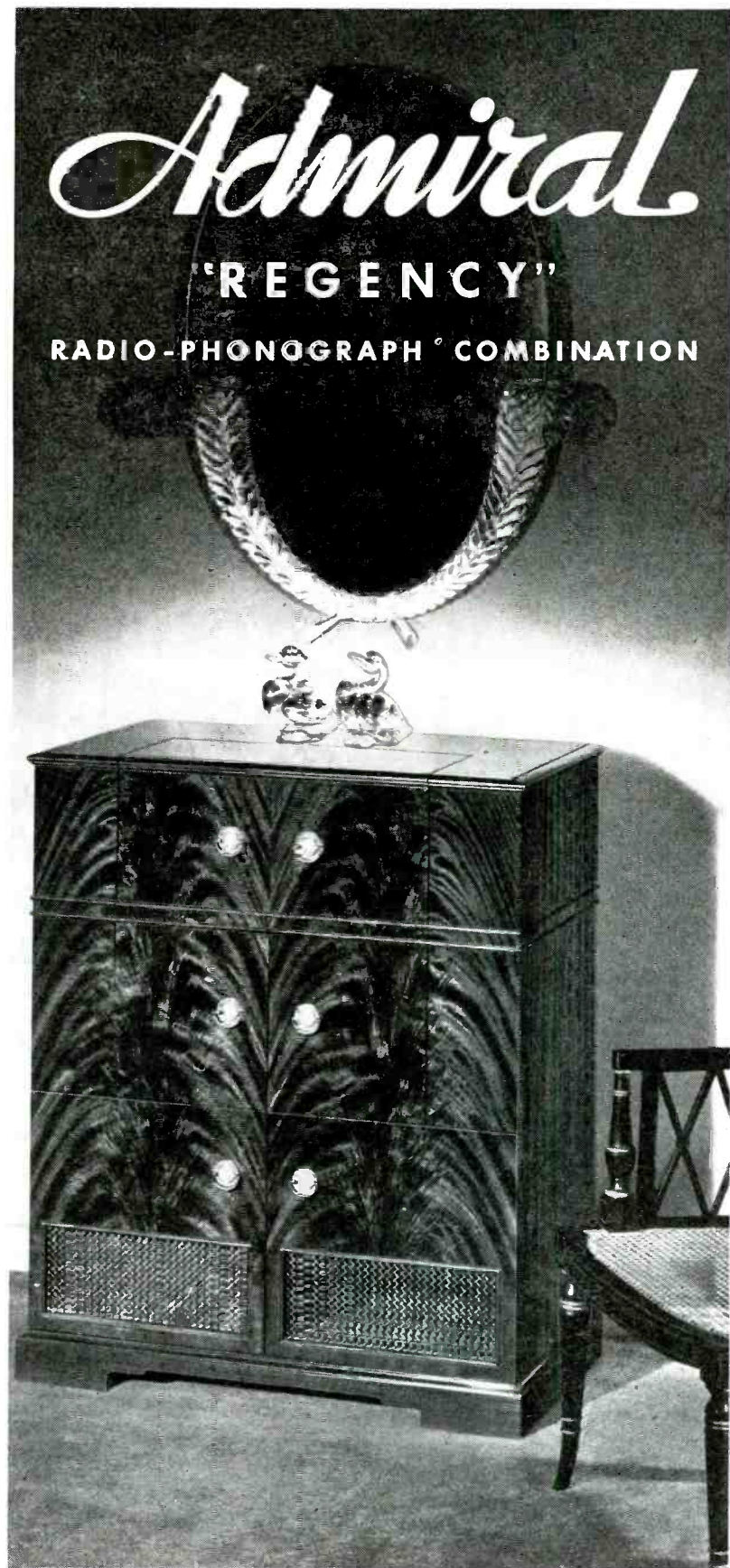
HERE'S NEW BEAUTY
FOR THE TOP
OF YOUR RADIO LINE

Here's new cabinet beauty and all-round performance that you can "sell up to." Beautifully finished and authentically styled by master craftsmen, the Admiral "Regency" Radio-Phonograph combination will be available in walnut, mahogany, or bleached mahogany.

Famous "Slide-A-Way" brings "child-proof" automatic record changer out in plain view for easy loading. Plays ten 12-inch or twelve 10-inch records automatically. Changes records in 5 seconds . . . only three moving parts . . . will not chip or break records.

Improved Superheterodyne circuit features new iron core tuning for higher sensitivity, greater selectivity . . . "automatic-trip" electric tuning for instantaneous station selection . . . individual treble and bass controls . . . 4 tuning bands for 'round-the-world reception . . . "Magna-Band" for precision short wave tuning . . . "Auditorium" electro-dynamic speaker for superb tonal quality . . . push-pull audio system for clear, natural reproduction . . . beautiful, easy-to-tune "waterfall" dial.

In the "Regency" you have a superb radio-phonograph combination to put at the top of your radio line.



Admiral Corporation

CHICAGO — DUAL-TEMP REFRIGERATORS • ELECTRIC RANGES

WORLD'S LARGEST MANUFACTURER OF RADIO-PHONOGRAPHS WITH AUTOMATIC RECORD CHANGERS

Cunningham Electron Tubes

... for Radio Service-Dealers

WHY RADIO SERVICE-DEALERS EVERYWHERE ARE TURNING TO CUNNINGHAMS



CUNNINGHAMS are built for service: Cunningham Electron Tubes are famous for their *consistently* high quality, long life and top performance. That's why they're favored by the servicing fraternity as the No. 1 renewal tube.

CUNNINGHAMS are time-proven: For over 30 years radio listeners have found satisfaction in Cunningham Tubes. Cunningham is a name they trust and look for when renewal tubes are required.

CUNNINGHAMS cover servicing requirements: Whether it's Metal, G or GT, there's a Cunningham type to meet practically every service requirement. No need to carry additional lines to round out your list—you can give your customers Cunninghams every time!

Ask your Cunningham Tube Distributor
for full details today

**A QUALITY PRODUCT FOR RADIO SERVICE-DEALERS
BY THE RADIO CORPORATION OF AMERICA**

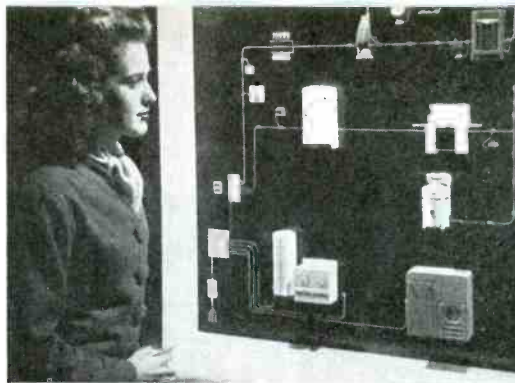
"WIRED" FOR SALES: Mock-up board shows how customers are qualified for radio and appliance purchases.

Left, top: "Thrift" installation is promoted with ordinary wiring, covers electric range, refrigerator, washer and ironer, water heater.

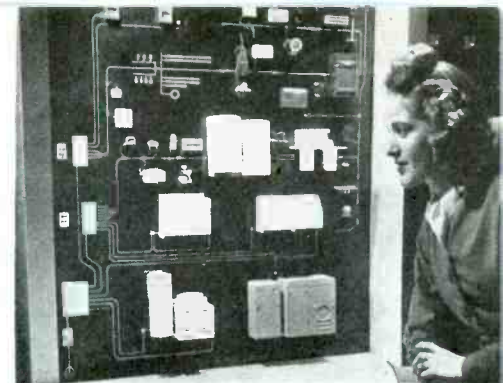
Bottom: "Budget" setup, with heavier wiring, adds automatic controls and dishwasher, etc.

Right, top: "Ideal" setup increases wiring, adds home freezer, clothes dryer, etc. plus new lighting.

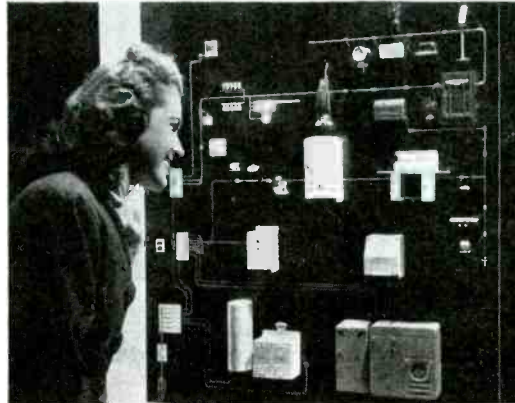
Bottom: "Deluxe" setup is the whole works, with adequate wiring to handle house heater and air conditioning unit, more radio sets, television combination console etc. (Seen at recent Westinghouse conference, Hotel Waldorf-Astoria, New York.)



CP 3742



CP 3744



WE want to give you some conception of this thing called "Electrical Living" as a business, with an expected volume of sales running into billions of dollars, offering employment to hundreds of thousands—including wage earners in factories; contractors who do wiring, install kitchen fixtures and remodel homes;—the dealers, many of them small businesses with two and three men employed, who sell, deliver, install and service the home appliances;—the utilities, private and public, that provide the current to light and power our homes.

Truly this is a tremendous business that has its effect on all other businesses and all our people. It can, and will be a tremendous factor in providing the jobs we have been talking about as so necessary to attainment of the high material economy we aim for; already it is much the highest in all this world, but none of us is satisfied that our goal has been reached.

The need for additional homes is, as you know, the most desperate want we have. It is generally agreed that we need, within the next ten years, seven to ten million housing units of all kinds. Shortage of men and materials will surely hold us short of what we need for several years, but it is hoped 350,000 to 400,000 housing units of all kinds, from single homes to great apartments, can be erected in 1946 and perhaps step up beyond the 700,000 mark in 1947. The value of this housing should be round a \$6,000. average per unit.

Sees Billions IN DEALER SALES

by **B. W. CLARK,**
Vice President in Charge of Sales
Westinghouse Electric Corp.

Adequate wiring will help promote era of "Electrical Living" with all income groups. Includes traffic and major appliances, major and room radio receivers and combinations, in quantities to suit buying power.

The business of "Electrical Living" starts with building, because concealed within the walls must be the wire, switches, protective devices, etc. that will take the life giving current to the lighting fixtures and appliances. At a probable average cost of \$160. per home, this preliminary of new house wiring should account to a volume in materials, labor and other costs, upwards from \$65,000,000. per year.

Added to this are the requirements of existing homes. Almost all of these are inadequately wired or protected for the use of the loads to be placed upon them by the rapid increase in electric utilization. At least 150 million dollars per year for several years should be expended in wiring costs

in the remodeling of our millions of existing homes.

Of the major utilization devices it is expected that the following will be required per year for both new and existing homes;

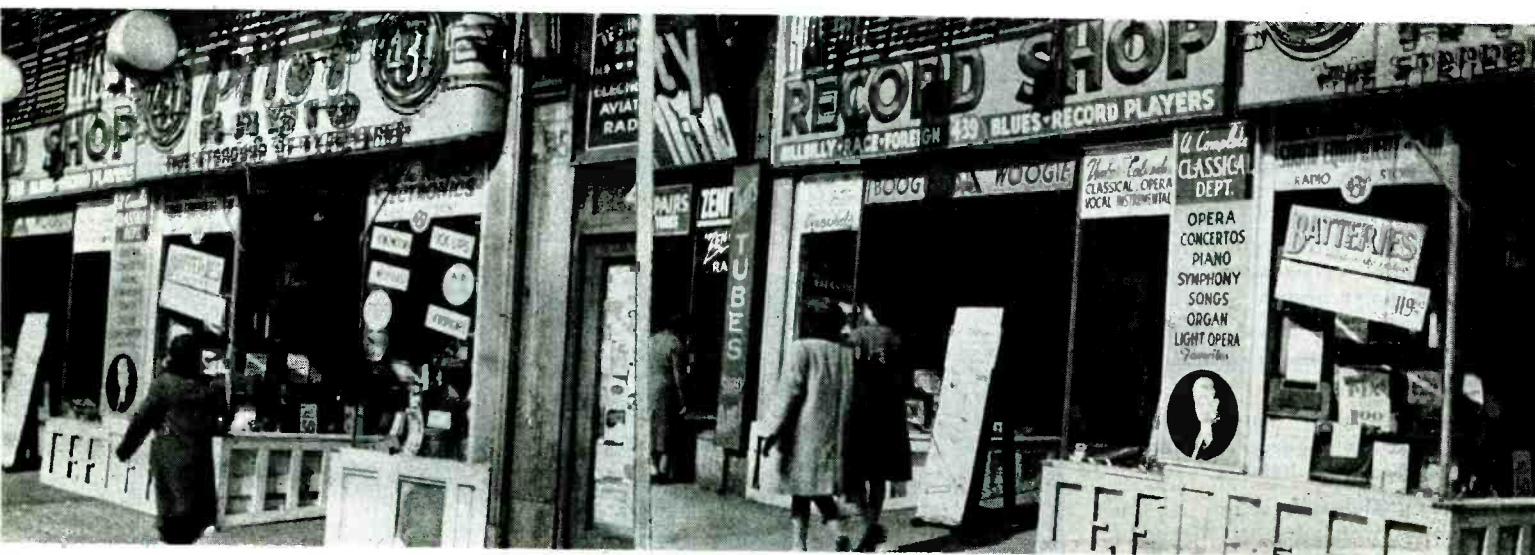
Radios	5,000,000
Electric Refrigerators	3,000,000
Washing Machines	2,500,000
Vacuum Cleaners	2,000,000
Electric Ranges	800,000

The radio estimate is for 1946—is expected to reduce in number thereafter but with television coming, will go up in unit value.

At average expected prices, these items total \$1,300,000,000. in sales volume per year for 5 years.

If we add the business in appliances

[see page 50]



Left: Exterior shows windows full of merchandise. "A window well stocked," says Mr. Levin, "tells customers that you have things to sell inside." Right: The record department was expanded into a separate, additional store.

STORE-WIDE SPECIALIZED

A departmentalized store can display merchandise more favorably than if it would have just a mass display of everything in stock. By departmentalizing, the merchandising trends of large department stores could be followed. Each item in the store has its own section and does not interfere with other merchandise. Departmentalizing of a radio and music shop has its benefits, in that customers can go directly over to the section of the store that is displaying the particular merchandise that the customers are seeking, and save the time and effort that is ordinarily consumed in looking over the store to find specific merchandise. At the same time, all merchandise of a similar class can be more easily compared by customers when they are all located in one location. And by keeping customers in one location of the store, customers can shop easier, quicker and take less of a salesman's time.

Sales Easier

A store that devotes a particular section of its area to specific merchandise has taken a step forward in making sales an easy job for its salesman as well as for the stock control men. For a store that devotes a certain area

Expanding dealer operation prepares for coming sales by establishing product and sales departments throughout store, in charge of specialized, trained sales people. Merchandising trends of department stores followed.

to radios or records should assign certain salesmen to those sections and give them complete charge of the merchandise in that section. And once a salesman knows that he is responsible for that particular section, and he can be singled out soon enough if his job is not done right, he will devote more of his time and energies in doing a good job.

"While there was a shortage of merchandise," comments Mr. Levin, "we naturally had a smaller staff of men in our store, and each one was able to wait on customers for practically any merchandise that they asked for and we had in stock. But as the stocks increased, we decided to assign particular personnel to take charge of our various departments that we were setting up, so that these men would become more efficient in selling the lines in their charge and continually try to better their sections. A salesman who

participates in sales throughout the store may know a little about the items he is selling, but the only time he can become an expert in any particular field is to work continuously on particular lines of merchandise. And as I believe that customers will demand an expert's opinion about merchandise that they will buy as soon as it is available, we have decided to start this policy now."

Stock Control

Departmentalizing makes it a simple matter for stock control men to keep track of store inventories. No time is wasted in taking a physical inventory of certain merchandise, as it is all in one location, and each section head is kept responsible for the merchandise assigned his section. Furthermore, a perpetual inventory rather than a periodic inventory can be maintained throughout the year

under the departmentalizing plan, as it is a simple matter for all section heads to keep copies of sales slips and invoices and be able to tell within a few minutes how the stock of radios, records or albums stands. Under this system, it isn't even necessary to close the doors for any length of time to take a physical count, as each section head can report his findings at a specific date, which would simplify the job tremendously.

Selling Sections

The Pilot Radio Store has devoted the front half of its floor space to the display of radios. Floor models are located along both sides of the store and a group of small radios are situated on racks above the floor models so that they can be seen. Three men have been assigned to take care of the cur-

of the particular record sections, a fourth to take charge of the records on open display throughout the store and the fifth as manager. With this break down, it is very simple to see that each man will eventually get to know his job thoroughly and at the same time be able to keep a complete inventory count of the merchandise assigned him.

The Pilot Radio Store also boasts a basement store that is set up in departments. One portion of it is the intercommunication section that handles all types of equipment in that line, as well as transmitters, loudspeakers, amplifiers and allied merchandise. The other section handles small repair and extra parts, such as knobs, small aeri-als, repair tools and accessories.

The third section is used as a store room, and even here stocks are given their specific locations, so that if any

employee in the store should go to the stock room for merchandise that is needed in his section, he will get it with the minimum of time and effort.

The third section is used as a store room. And even here stocks are given their specific locations, so that if any employee in the store should go to the stock room for merchandise that is needed in his section, he will get it with the minimum of time and effort.

"Any size store can be departmentalized", says Mr. Levin, "by devoting certain areas to specific merchandise, then giving entire charge of that section to certain employees. With this system in effect, customers can be handled more efficiently, and they will receive the benefits of experts advice, while the store will be able to have a better control of its merchandise and sell the same way as a department store."

SELLING

rent sales, and more will be assigned this section with the incoming of more merchandise.

The rear portion of the store is the accessories section. Here are large stocks of replacement parts, wires, radio cabinets, tubes and the numerous other items that make an up-to-date accessories and repair parts section.

An adjoining store has been taken over and made into an exclusive record shop. Formerly, records were also sold in the Pilot Radio Store, but in line with the stores departmentalizing program and the fact that record sales were continually increasing, made the move a timely one. And even the record shop is departmentalized within itself. The store is sectionalized into three divisions. The first and at the entrance to the store, is the popular records department, following is the album section and finally the classical record part of the store. At the extreme rear of the store are the four listening booths. They were purposely placed here, so that customers coming into the store would not interfere or be interfered by those that want to hear selections.

Of the five salesmen in the record shop, three have been assigned to one

This is the intercommunications and loud speaker section of the departmentalized basement store. Another basement department features accessories and radio parts and equipment, open to the public and other dealers.

Front part of the Pilot store is reserved for the display of home radio receivers. Some stock is always on hand, in a miscellany of types & models.

The interior of the Record Shop shows a well stocked store. Popular recordings are displayed on self-service counter racks (left foreground); albums are kept on wall shelving, handed to customers by trained sales personnel.



KEEP THE TELEVISION CUSTOMER "SOLD"

by DAN HALPIN

KEEPING the Television Customer Sold," is an appropriate subject for discussion by retailer, distributor, broadcaster or television producer. In the manufacture and distribution of television receivers, "Keeping the Television Customer Sold" is vital to the success of a manufacturer, because it represents the desirable ultimate in efficient post selling. It means that the manufacturer knows factually how his customer enjoys his product.

Millions spent in research and endless man hours used in development or manufacture are meaningless ten minutes after the customer tunes in a television program. Then, "The show's the thing." I have unlimited faith in the ability of radio broadcasters, based on their years of practical experience, to give television audiences what they want in entertainment.

Programs

One study I made on sources of television program material some time ago indicated that there were 3,441 major "box office" attractions annually in New York, pre-war. Of these, 1,080

Industry is keeping television a "live" item with consumers. Annual sale of 5 million sets foreseen.

were complete sell-outs. There is a wide variety of material available for television, once mobile pickup equipment becomes more generally available. Major attractions seen in the home exactly as they are happening is television at its best.

Of course, studio presentations and film will contribute materially to keeping the customer sold. He will not be content, however, to see trite material which he has already seen or does not care to view. In television he expects the new in techniques as well as programs.

On the subject of programs, it seems logical to me that every manufacturer of television should be on the air, if he expects to really sell receivers. A television program is a "must" for the company sincerely interested in maintaining its competitive position in the market.

Advertising of sets should feature their importance as family entertainment. It should create the desire for the prospect not only to own a re-

ceiver, but also to be proud of his installation to a degree that he invites his relatives, friends and neighbors to see "his" television. While sold, he is television's and our best salesman, booster and friend. The old slogan, "Ask the man who owns one," could well be the theme not of a company but of the entire television industry.

Sales

Now this happy state of affairs presumes that a television receiver has been fairly advertised, honestly merchandised, properly installed, serviced and maintained by its manufacturer or under his close, direct supervision. There will be no short cuts in television. Selling of receivers will call for a calibre of salesmanship never before achieved. But even more important, morality in merchandising must be on a new and higher plane.

The reputation of every manufacturer and dealer is at stake if, as and



THE AUTHOR

TELEVISION A MARKET AID

Television will prove a powerful aid in the intensive selling and development of markets which will be needed after the war to create millions of new employment opportunities, according to Dan D. Halpin, television receiver sales specialist of RCA Victor.

Mr. Halpin estimated that within five years after the commercialization of television it will develop into a billion-dollar indus-

try, and that by the end of another five years there-after television service should be available to about 100,000,000 people in 23,700,000 wired homes, representing 82 percent of the nation's buying power. Such a service, he pointed out, would provide the vendor of goods or services with the equivalent of 23,000,000 intimate "fireside" show-rooms in which he could present simultaneous demonstrations under the most favorable conditions.

when he sells television. Not only must the customer have uninterrupted service from his receiver, but programs must achieve new highs in variety of material.

The television set owner must consider himself a pioneer and cooperator with a definite obligation and function to guide the broadcaster as to his likes and dislikes. He will do this and wants to help. Broadcasters have been surprised at their ratio of replies from the current television audience. This is because the viewer feels that his reactions are important to future programs.

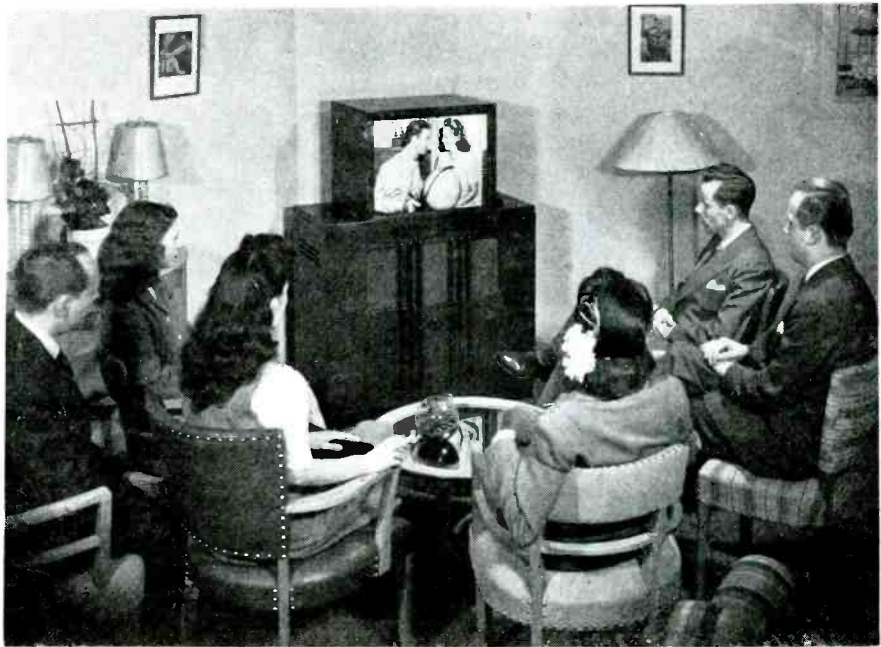
Manufacturers who plan to sell television should plan now to book choice time as a station's schedule is necessarily limited. Fortunately, the time best for a manufacturer of television is not necessarily evening hours. It might well be noon period, or afternoons, when people can shop. A manufacturer should consider the importance of not only televising in shopping hours, but also see that his product is featured during evening hours over programs of leading advertisers to the family group interested in "What's new," and particularly to Mother, who is generally the "purchasing agent" for her family. Based on the programs seen, she, too, will not only respond to goods advertised by sight and sound with motion, but she will share her family's enthusiasm with her neighbors as well.

"Keeping the Television Customer Sold," therefore, calls for,

1. Honesty in advertising and merchandising.
2. Adequate provision by a manufacturer of low cost installation, service and maintenance.
3. Programs of continuous interest by a wide variety and appeal.
4. New achievements in television by extensive use of portable field pickup equipment.
5. A determination by a sponsor to provide the kind of programs his audience favors.
6. Television programs by all who hope to sell receivers.
7. Post selling of a new high calibre by manufacturer, distributor and retailer, to be sure his customer obtains value received for his money and recommends the product he has to his friends.

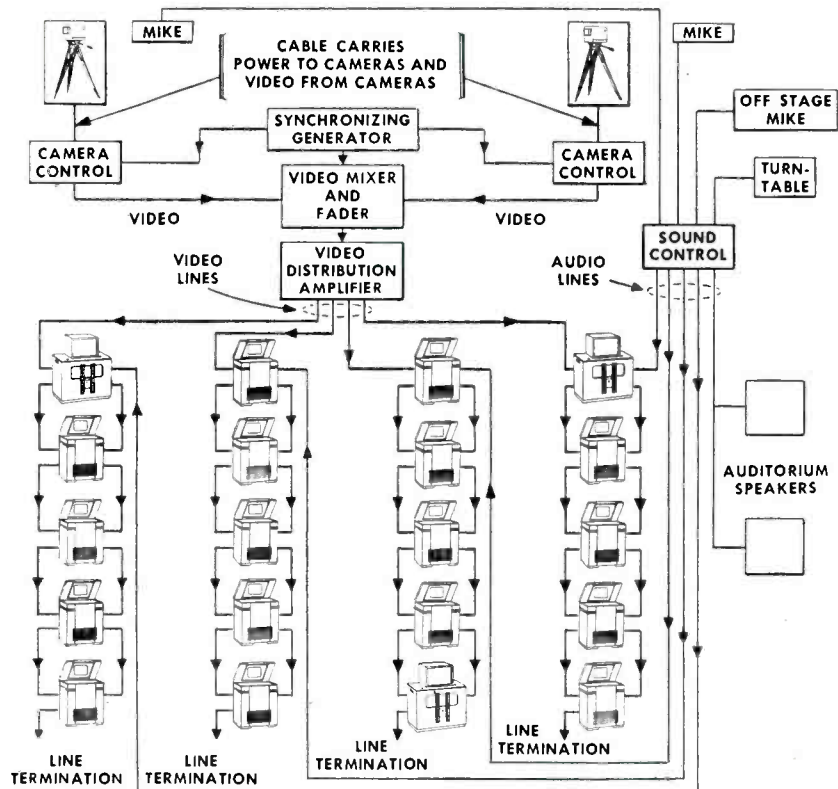
Never in the history of American business has there been such an opportunity for all of us to serve the people well and benefit accordingly. It was often said in the past that television is one of America's most promising industries. Those days are over, now we must "Beat the Promise." In fact, it's time to stop talking and do something about it. Action that will

[see page 46]



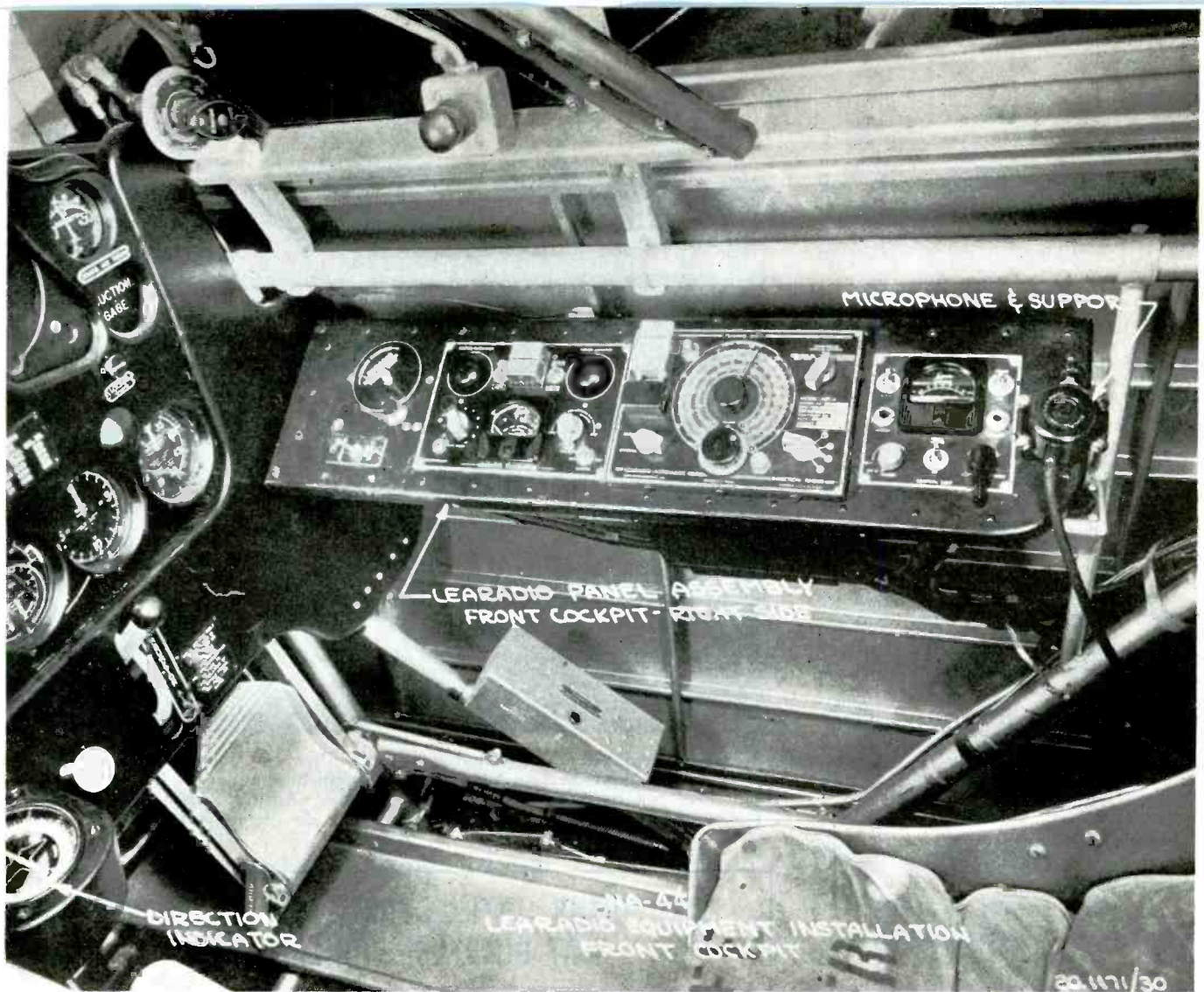
MARKET SCENE: Entertainment — yes. Plus — showings of fashions in clothes for men and women; home furnishings; latest in autos, shoes, pottery, rugs; household gadgets, from washing machines to potato peelers. "Eye-and-use" appeal items will be promoted on tele-screens.

RCA VICTOR INTRA-STORE TELEVISION SYSTEM AT GIMBELS · · PHILADELPHIA



This diagram shows the equipment and hookup used by RCA Victor for the most extensive intra-store television system ever installed. The system was used in the intra-store television demonstration held at Gimbel's-Philadelphia department store from October 24 to November 14. This was the first major test of the effectiveness of television as a merchandising medium and was declared highly successful by Gimbel executives. Two television

cameras were operated on a stage in the store's auditorium, transmitting 10-minute programs every half-hour during regular store hours to twenty television receivers located on seven floors of the store. Three of the receivers represented are unstyled laboratory models of RCA's large-screen projection type receiver; the rest are TRK receivers of the type in use for the past five years. More than a quarter-million persons witnessed the demonstration. RCA Victor is contemplating similar demonstrations in leading department stores throughout the country.

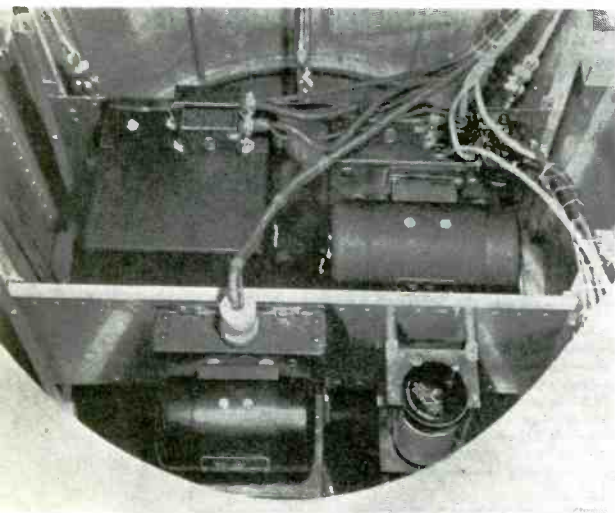


Typical aircraft radio installation in cockpit. This plane is equipped with two transmitters. Receiver is superheterodyne, with one crystal-controlled receiving frequency. Below, left: Typical medium power transmitter and receiver outfit for larger size light planes. Instead of dynamotors, most personal planes use familiar automobile vibrator-type power supply for operating voltage. (Lear Inc. photos.)

SERVICE THOSE FLYING

by **RAYMOND LEWIS**

Down-to-earth facts about up-in-the-air radio service



AVIATION radio is a field virtually untouched as a lucrative source of income for the radio service dealer. Now, with the greatest boom in personal plane aircraft in our history about to start, this field demands immediate attention that can be supplied only with the greatest effort on the part of radio repairmen. It is a fact, as we shall illustrate, that the very success of the light-plane and private aircraft business may depend to a large measure upon the radio service dealer. Yet, hardly any of them are aware of this impending crisis, nor the specialized requirements, lines, and problems of aviation radio.

In good weather, when every aircraft has perfect visibility, radio is to

a certain extent a mere convenience. But even here, if several planes are in the vicinity it is difficult for a tower to convey instructions using lights or flags. The condition multiplies to such an extent that many large airports will not permit a non-radio equipped plane to land except in emergencies.

In instrument weather, where visibility restricts clear weather or "contact" flying, in order to be fully informed of adjacent traffic an aircraft must be in two-way communication with the ground, as well as have the necessary equipment to fly the sky highways, the radio ranges. Instrument flying without radio is like driving blindfolded. It stands to follow, that in order to get all-weather flying

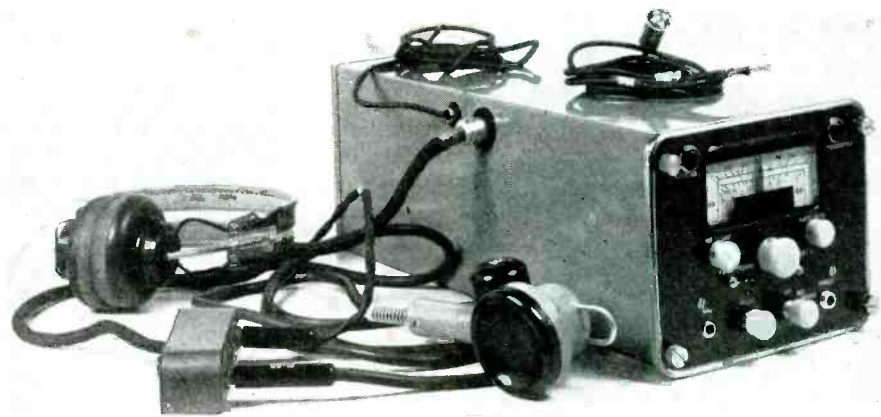
from any plane it must be radio equipped. Likewise, if an airport is going to handle any volume of traffic, or be an all-weather field, it too must be fully equipped with radio.

As traffic increases on the federal airways, which are the highways of the air, in order to regulate traffic—regardless of weather conditions—radio will probably be mandatory equipment on all aircraft doing other than local flying. All of this adds up to many thousands of installations and an entirely new service problem.

Let us examine briefly the facilities provided for radio services and equipment necessary to utilize these facilities. At the present time, as far as the personal plane owner is concerned, all his aids except some airport towers are operated by the Civil Aeronautics Authority (CAA). These might be divided into those radio aids for airport and airways traffic guidance, those for navigation, and finally those radio aids for instrument landings.

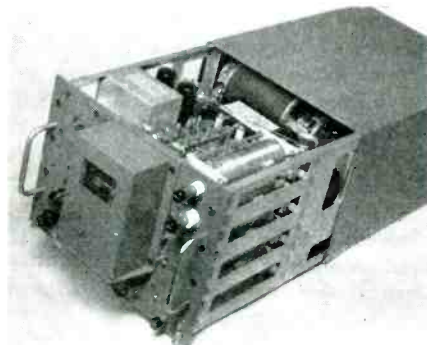
There are two different systems of aircraft radio now in the United States, one operating on the low frequencies and the other operating on the very high frequencies. While they are both actively used, and there is a predominance of low frequency facilities at the present time, a change over is rapidly being made to the VHF's.

For local control, there is, of course, the tower. On the low frequency they



Modern personal plane radio. Receiver covers 3 bands: range and broadcast band and 75 MC VHF channel. 15 watts power output supplied by 3105 KC crystal-controlled transmitter. (Raytheon Radiophone, by Belmont Mfg. Corp.)

Actual control is from the airport traffic control tower. Also included as part of the instrument landing system is a glide path. The glide paths will operate on six specific frequencies in the band 328.6 to 335.4 megacycles. Because a separate receiver would probably be required for this band, it is unlikely that most private aircraft will use the glide path, which because of their slower speed and high degree of maneuverability are easier to handle than the big commercial airlines. The instrument landing system runway localizer is merely a VHF visual range, designating the runway instead of an airway.



RCA automatic multi-channel transmitter for large private planes. It is also a source of service business.

RADIO SETS

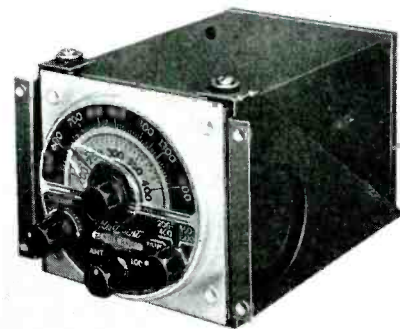
— in a nation of air-minded private plane operators.

operate from 200 to 400 kc. On the VHF's from 118 to 122 megacycles. The tower gives the pilot clearance, taxi and parking orders, landing and takeoff instructions.

When flying under instrument conditions, or on the range designated airways, instructions are obtained from air traffic control. On the low frequencies ATC replies on simultaneous voice channels operating in conjunction with the various individual radio ranges. On the VHF's, air traffic control will also be conducted on simultaneous range voice channels.

When making instrument landings, voice control is maintained on the same channel as the localizer unit of the landing system, 108 to 112 mc.

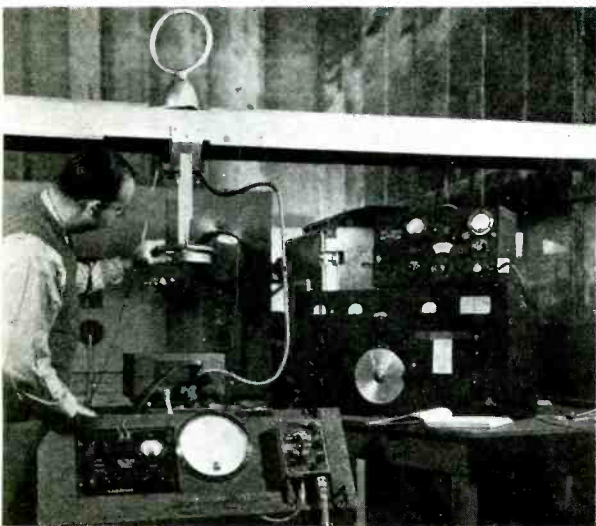
Low frequency radio ranges are the standard four course aural type, using A and N quadrant identifications with an overlapping solid on-course signal for on-the-beam identification. The VHF Ranges are of the two-course visual, two-course aural type at the present time. The aural legs are flown in much the same manner as those of the low frequency ranges. The visual legs actuate a needle type indicator, the same indicator used for the visual beam of the VHF instrument landing system runway localizer. The needle indicator is considerably more sensitive to signal changes than the human ear. In addition it provides a uniform standard of range flying, because aural definition of the twilight zone (the



2-band plane radio receiver by Radio Division, Bendix Aviation Co. offers ranges of 200-400 KC and 550-1500 KC. Direction finding loop for navigating by radio may be used with Bendix PAR-70, leader in Flightweight line.

area where the quadrant letter identification fades into an on-course signal) varies greatly with individual pilots.

Eventually all VHF ranges will be converted to omnidirectional visual ranges. These provide a multiple choice of courses to be flown. A 360 degree dial-like pointer is set on the course



Test equipment used to work on direction finder: signal generator; wave-meter; frequency standard; low voltage DC supplies, as well as all standard service shop test equipment are essential for servicing plane radio. (Photo shows Bendix laboratory worker).

desired (within 3°). The aircraft is then flown until the pointer is in a vertical position.

Let us run over the normal communication sequence for clarification. The VHF ranges or low frequency ranges will guide the pilot along the airways and provide him with weather and traffic control information. As the pilot approaches the airport of intended landing, the runway localizer of the instrument landing system will provide guidance to the airport and approach instructions from the control tower will be available on the simultaneous voice channel of the localizer. If the pilot desires the additional benefits of the glide path, a glide path receiver operating in the 328.6 to 335.4 megacycles would be necessary. To use the fan and Z markers at the present time, a receiver covering 75 mc would also be required, but these may be shifted to the 108 to 132 megacycle band. After the pilot has completed his approach and is underneath the overcast, he will shift his receiver to the control tower's local control frequency in the 118-122 mc band for final instructions in the preparation for a landing. After the aircraft is on the ground and off the runway in use, the pilot will shift frequency once more for taxiing and parking instructions.

Thus, it will be seen that the whole plan for navigation, communications and traffic control contemplates that it will be possible for the average private pilot to secure all of the essential airway services through the use of but

one receiver. This receiver will require continuous coverage from 108 to 132 mc.

Few aircraft will have initial installations covering all the frequencies, DF, etc., if for no other reason than the weight carrying restrictions of the personal plane. But if a majority of private pilots want equipment, as they have repeatedly indicated in questionnaires and polls, it is a wonderful potential market.

At the present time there are aircraft radio dealers at the largest fields. But by far the greatest number of airports have neither sales or service facilities. One reason is that most airports could not do a sufficiently large volume of business to support a business devoted exclusively to airport radio. Another is a lack of foresight on the part of local radio service dealers.

There are several possible ways to handle aircraft radio sales and service. This article is not meant to be the final solution, but rather an introduction to the field, so we shall not go into exhaustive details.

First, and of primary importance, the dealer would have to have a fully qualified aircraft radio mechanic on his payroll. This man would have to hold a FCC license and be thoroughly conversant with all the phases of small aircraft aviation radio. He will be your direct representative in dealing with a public who, while not necessarily radio technicians, are technically inclined.

The radio service dealer must be prepared to work in cooperation with a locally licensed aircraft mechanic. This mechanic will be required for mechanical work on the plane and for submitting a reworked weight and balance on the plane after the radio equipment is installed.

It will be the responsibility of the radio service dealer to assist the prospective customer in obtaining his radiophone license and an aircraft radio station license. The pilot is only required to secure a Third Class Radiophone license; the examination for which is a non-technical series of questions on federal radio rules and regulations. The station license requires technical information that only an experienced radioman can answer, hence it is the dealer's obligation to assist the customer. Both of these licenses are likely to be modified and simplified to enable pilots to obtain them with an absolute minimum of effort. It will be an invaluable aid to local flyers if the radio dealer stays abreast of the latest licensing developments by keeping in touch with the FCC and CAA.

It is rather obvious that if the local airport control tower is not radio

equipped, many flyers not contemplating cross country or airways flying will be reluctant to invest in radio for the plane. Yet the average airport, without cooperation from an interested radio dealer, cannot afford the operation and maintenance of a tower. The answer? A dealer contract to provide radio service to the airport at a nominal charge. Perhaps even sharing the salary of an all around radio maintenance man and tower operator. Any such program will probably interest most airports provided there is an aggressive effort on the part of the radio service dealer to put it across!

Aircraft radio sales and maintenance is not unlike home sets, with the added premium on reliability. Work must be top-notch! But troubles, when they do develop, are usually minor, because the original equipment, if it is any reputable line, is far superior in construction to most home receivers. Tubes, or a connection vibrating loose are run of the mill ailments that cause much aircraft radio failures. Trouble shooting is kept to a minimum.

Miscellaneous services that the live-wire radio service dealer should offer is an inexpensive frequency checking service (now required by law) and a complete check-up on the aircraft radio at a moderate fee; fast on-the-field service for itinerant aircraft. Contracts with feeder lines or charter services might also be obtained if proper facilities are available. In return for his effort in establishing a local headquarters for aircraft radio, the radio service dealer will add a line to his business that will be constantly expanding in volume. Once established, competition is less of a threat than in most other radio lines. There is no price-cutting. A radio service dealer who has the confidence of flyers will gain greatly in prestige in any community where his aviation connections are generally known. The margin of profit is good. Viewed as an overall picture, aircraft radio sales and service can provide a substantial volume of business that becomes more lucrative and firmly established every year.

Aviation radio sales service is definitely not the kind of business for a one-man shop to go after! To obtain a dealer's franchise for aircraft radio equipment a fairly high degree of financial responsibility, as well as minimum service facilities, will have to be established. But not only will a profit be made on aircraft sales and service, it will attract new customers in all departments. To be allied with aviation in an air-age is a progressive move, a live-wire radio service dealer should seriously consider right now—before his competition beats him to it!

MERCHANDISE PRE-VIEWS—10



Series 652, 6-Tubes



Series 1000, 6-Tubes



Model 605W, 5-Tubes



Model 1002, 6-Tubes



Series 609, 5-Tubes



Model 1001, 6-Tubes

Left, reading down: 652 Series, 6 tube superhet; 105-125 volts AC-DC. Tubes, 2-14A7; 1-14Q7; 14B6; 1-35A5; 1-35Y4. 528-1680 (568-178 meters) tuning range. 6 tuned circuits. Two watts power output. Alnico 5" dynamic speaker. Colors: alabaster; maroon; blue lapis lazuli; onyx. OPA-approved price \$36.50. Model 605W, 105-125 volts AC-DC, 5 tube superhet. Tubes, 1-12SK7GT; 1-12SA7GT; 12SQ7GT; 50L6GT; 35Z5GT. 5 tuned circuits. Other details as above. OPA-approved price, \$23.95. 609 Series, 5 tube superhet. Tubes, 12SA7; 12SK7; 12SQ7;

50L7GT; 35Z5GT. Golden Glow illuminated dial; other details as above. OPA-approved prices, Walnut plastic — \$19.95; ivory, \$21.95.

Right, reading down: 1000 Series, 6 tube AC-DC superhet. Tubes, 12SA7; 12SK7; 12SQ7; 35Z5; 35L6. 6 tuned circuits. Other details as above. Colors: alabaster; maroon; blue; onyx. OPA-approved price, \$35.50. Model 1002, AC-DC superhet; 6 tubes, 12SA7; 12SK7; 12SQ7; 35Z5GT; 35L6GT. 1 broadcast band, high fidelity and some police. 6 tuned cir-

uits. Other details same as above. OPA-approved price, \$29.95. Model 1001. 6-tube superhet. Tubes, 12SA7GT; 12SK7GT; 12BA6; 12SQ7GT; 35L6GT; 35Z5GT. Other details as above. OPA-approved price, \$35.50.

According to Fada Radio & Electric Co., 30-20 Thomson Ave., Long Island City, N. Y., the above models will be in production first; then will come table combinations, with and without FM; and finally, consoles and deluxe models. Some of these shown above are on display at dealers.

NEW PRODUCTS

radios and



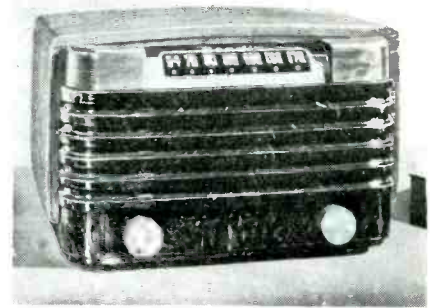
Howard

Model 901-W 5-tube AC-DC walnut cabinet table model. Superhet circuit. Full-vision dial. Range 540-1700 kc. 5" dynamic speaker. Beam output. Howard Radio Co., 1731 Belmont Ave., Chicago, Ill.



Magnavox

Belvedere Chippendale style 13-tube radio-record-changer AM console with optional FM chassis using additional 8 tubes. 8 station push-buttons. Range: broadcast and 4.9-18.3 mc shortwave bands. Two 12" duosonic speakers, light-weight pickup and permanent needle. Magnavox Corp., Ft. Wayne, Ind.



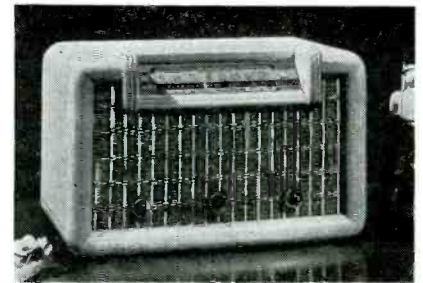
Bendix

Model 526-C; 5-tube AC-DC super het radio in green-black catalin cabinet. Built-in antenna. Illuminated 3-color slide-rule dial. Covers 535-125 kc range. Alnico speaker. Bendix Radio Div., Towson, Md.



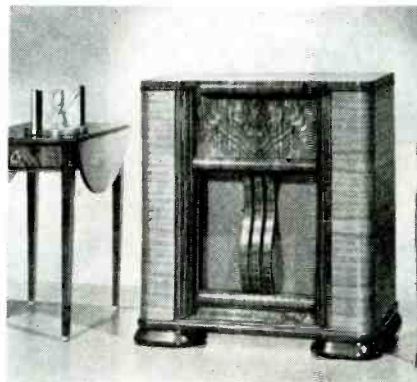
Bendix

Model 626-A; 6-tube AC-DC gray plastic table radio. Built-in handle and antenna. Covers standard-police bands, 535-1725 kc and short-wave 5.7-12.5 mc. AVC. Alnico core oval speaker. Phonograph-television connections. Bendix Radio Div., Towson, Md.



Bendix

Model 636-D; 6-tube AC-DC super het light oak cabinet table radio. All-metal grill, illuminated 3-color slide-rule dial. Covers standard and police bands, 535-1725 kc. Alnico oval speaker. Phonograph-television connection. AVC. Tone controls for radio and phono operation. Bendix Radio Div., Towson, Md.



Bendix

Model 736-B; 7-tube super het radio-phonograph in modern American walnut console. Automatic single button record-changer, lightweight pickup, permanent needle. Covers 535-1725 kc and 5.8-22 mc bands. Illuminated 3-color slide-rule dial, push-pull beam power output. Built-in beam antenna. 10" electrodynamic speaker. Bendix Radio Div., Towson, Md.



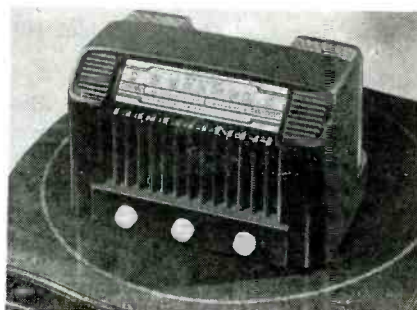
Miracle

Automatic electric roaster, 22-quart capacity, thermostatic control. Miracle Electric Co., 36 S. State St., Chicago 3, Ill.



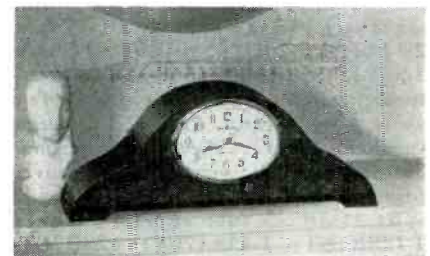
Bendix

Model 736-A; 7 tube super het in modern classic butt walnut console. Illuminated 3-color slide-rule dial. Covers standard and police bands, 535-1725 kc and shortwave bands 5.7-22 mc. Built-in beam antenna 10" electro dynamic speaker. Phono-television connections. Bendix Radio Div., Towson, Md.



Bendix

Model 636-A; 6-tube AC-DC super het plastic cabinet table radio. Built-in handle, illuminated 3-color slide-rule dial. Covers standard and police bands, 535-1725 kc. Built-in antenna. AVC. Phonograph-television connections. Bendix Radio Div., Towson, Md.

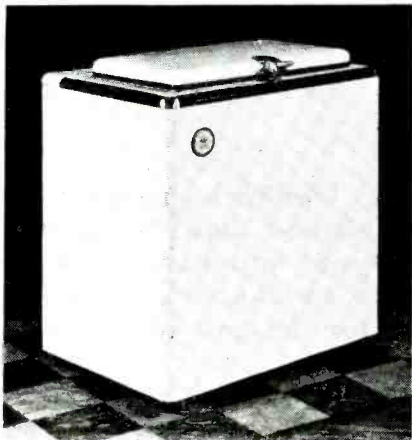


General Electric

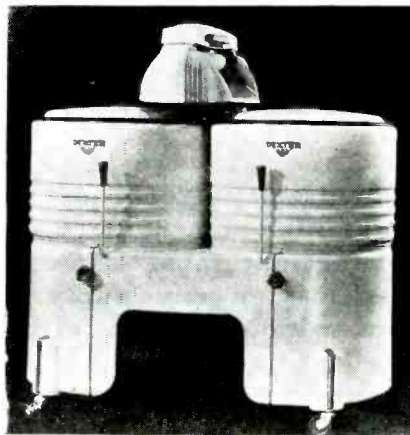
Mantel chime clock. Electric self-starting. Grained walnut case 17³/₈" wide, 6¹/₄" high, 5¹/₂" deep. Price \$25.00. General Electric Co., Appliance & Merchandise Dept., Bridgeport, Conn.

appliances

NEW PRODUCTS



FRIGIDAIRE, home freezer, four cubic ft. capacity. Meter-miser motor; and cabinet dimensions of 34 x 36 x 24 inches. Storage opening 12 3/8 x 24 5/16 long x 23 inches deep. Frigidaire Div., General Motors, Dayton 1, Ohio.



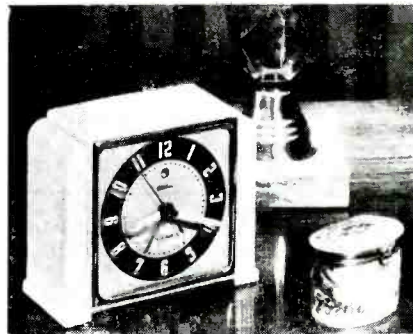
DEXTER, model 458E Deluxe Twin Tub Washer. Designed so clothes may be routed straight through washing and drying processes, or both tube may be used to wash, or to rinse, at the same time. Sturdy metal construction, baked white enamel finish, chrome trimmings. The Dexter Co., Fairfield, Ohio.



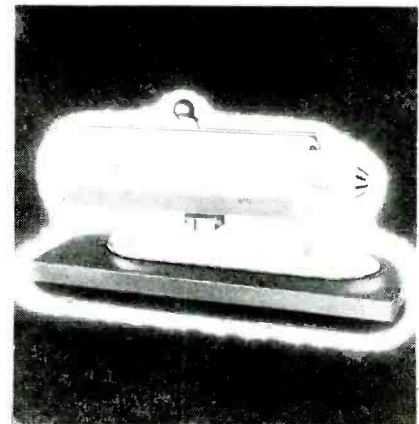
GENERAL ELECTRIC, clothes dryer model AD-6. Automatic tumble dryer, capacity 9 pounds of dry clothes. Thermostat prevents overheating. General Electric Co., Appliance & Mdse. Dept., Bridgeport, Conn.



ADMIRAL, electric range. Four Flex-O-Heat burners, master control panel with easy vision dials. Extra large oven and broiler compartments and storage drawers. Admiral Corporation, 3800 W. Cortland St., Chicago, Ill.



TELECHRON, "Telalarm" self-starting electric alarm clock model 7H91. Case of ivory plastic. Hands luminous, dial 3 1/2". Supplied with 6 ft. cord, weighs 2 lbs packed. Warren Telechron Co., Ashland, Mass.



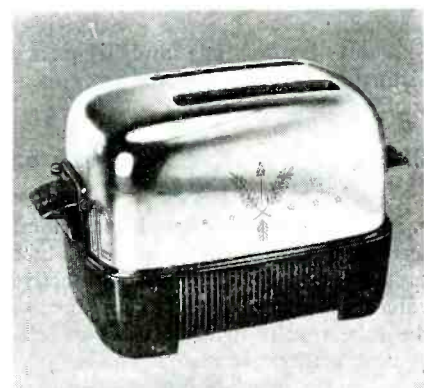
GENERAL ELECTRIC, rotary ironer, model AR-17, identical to model AF-18, except that it is manually controlled. Automatic latch holds control in pressing position. Operating lever is located for operation with either hand. General Electric Co., Appliance & Mdse. Dept., Bridgeport, Conn.



HOTPOINT, rotary portable ironer with 22" tension determined by hand. Edison General Electric Appliance Co., Inc., Chicago 44, Ill.



SWARTZBAUGH, Everhot model 900 roaster. Has Lock-In lid, moisture control, temperature guide, timer clock and cover lifter. Capacity 18 liquid and 20 dry pounds. White baked enamel finish. Operates on 115 volts A.C., draws 1320 watts. 40" high with cover closed. Cooking well 16" long, 11" wide and 5 1/2" deep. Swartzbaugh Mfg. Co., Toledo 6, Ohio.



GENERAL ELECTRIC, model T-77 toaster. Automatically toasts two slices of bread at one time. Finished toast pops up. May be kept warm by pressing lever down with current off. Bright metal finish. Textolite base and control knobs. General Electric Co. Appliance & Merchandise Dept. Bridgeport, Conn.

Applying Negative Feedback

Voltage and Current Feedback

Feedback may be effected by means of a voltage transfer from the output stage to any of the input stages. This is called *Voltage Feedback* (see Fig. 5) to differentiate it from *Current Feedback*. The latter is effected by means of a current change which is produced in the cathode circuit (see Fig. 6). This current change produces a corresponding voltage change which is effectively in series with the signal voltage.

The gain in current feedback is given by the following formula:

$$A^1 = \frac{\mu(R_f + R_L)}{R_f(\mu - 1) + R_L + r_p}$$

where: μ is the amplification factor of the tube

R_f is the resistance across which the feedback voltage is developed

R_L is the plate load resistance

r_p is the plate resistance of the tube

The characteristics of voltage and current feedback are somewhat different. Voltage feedback reduces noise, hum and distortion in accordance with the factor

$$\frac{1}{1 - A\beta}$$

On the other hand, current feedback will not reduce distortion, in spite of the fact that it is effective in reducing noise and hum. In input circuits, where hum and noise are developed, current feedback is used more often than voltage feedback. However, in output circuits, where the greatest percentage of amplitude and frequency distortion is generated, voltage feedback is used exclusively.

Effect of Negative Feedback on Plate Resistance

Negative feedback produces an effect on the plate resistance of a tube causing a reduction of its effective value. Reducing the plate resistance of the tube results in better output voltage regulation. It also simplifies output transformer design, as well as reducing the possibility of distortion resulting from a low load resistance over a plate resistance ratio. Finally, recalling that the action of the loudspeaker is analogous to a motor, the

Beneficial effects of negative feedback amplifiers: reduction of hum, noise, amplitude and frequency distortion; also effective output impedance. How servicemen can apply negative feedback on receivers which do not utilize it, for benefit of clients.

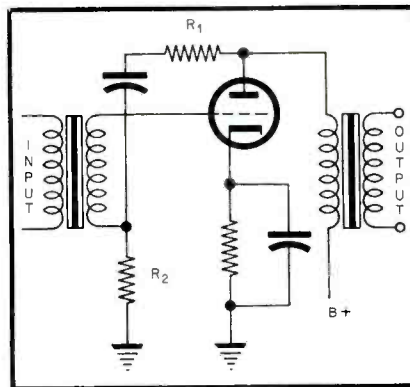


Fig. 5. Voltage feedback applied to a single stage of an audio amplifier.

load on which is the tube plate resistance, it is logical to assume that the lower the value of this loading resistance, the greater is its damping effect. The net result is a reduction of speaker hangover distortion.

The extent to which the plate resistance is effected by negative resistance is given by the following formula:

$$R_o^1 = \frac{R_o}{1 - A\beta}$$

where: R_o^1 is the plate resistance with feedback

R_o is the plate resistance without feedback

The output impedance of an amplifier due to current feedback is:

$$R_o^1 = R_p + R_f(1 + A)$$

where: R_p is the plate resistance of the tube

R_f is the portion of the cathode resistance across which the feedback voltage is developed.

A is the gain of the amplifier without feedback.

This means that the output resistance of an amplifier using current feedback is considerably increased, which is an effect opposite to that produced by voltage feedback. It is for this reason that current feedback is not recommended in output circuits containing speaker loads.

It can be shown that current feed-

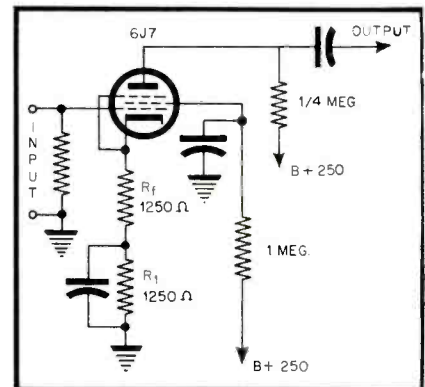


Fig. 6. Current feedback applied to a single stage of an audio amplifier.

back also increases the apparent input resistance of an amplifier according to the formula:

$$R_i = \frac{R_g}{1 - A'/2}$$

where: R_i is the apparent input resistance of the amplifier

R_g is the grid load resistance

A' is the gain of the amplifier with feedback

The applications of this property are made use of in phase inverters, cathode follower circuits, and in devices where it is desired to effect a high input resistance.

Practical Circuits

Figure 7 illustrates an excellent feedback circuit for use with small power pentode tubes such as the 50L6. Servicemen will find that the inclusion of this circuit in a receiver will increase its fidelity of reproduction quite noticeably.

Figure 6 illustrates a circuit used to reduce hum in the low level stage of an amplifier. In Fig. 8, a typical arrangement is shown of a circuit used in a phase inverter, push-pull amplifier. Voltage feedback is employed in the output stage and current feedback in the phase inverter. Common to both feedback circuits is the cathode resistor, R_f . Since the other portion

In Audio Amplifiers

by S. L. MARSHALL

PART 2

of the cathode bias current, R_1 , is heavily by-passed to ground through C_c , it does not contain any signal components and therefore contributes no feedback energy to the circuit.

Sometimes, in connecting up a feedback circuit, regeneration takes place instead of degeneration. This is caused by reversed feedback connections, putting the feedback voltage in phase with the incoming signal. Reversing the output transformer connections, primary or secondary, will remedy this condition.

Feedback Over Two or More Stages

Feedback may be taken over more than one stage. The overall reduction in distortion for a 2-stage amplifier is,

$$D_0 = \frac{D_1}{1 - \mu A \beta}$$

where: D_0 is the distortion with feedback
 D_1 is the distortion without feedback

μ is the amplification factor of the final tube

A is the gain of the stages preceding the final tube

Care must be exercised when applying feedback to two or more stages so that regeneration due to phase shift does not take place. This phase reversal occurs at the extreme frequency limits, so that if any regeneration is present it is not caused by the mid-band frequencies. In general, the lower the feedback ratio the less tendency will there be towards oscillation due to phase shift. Screen and cathode circuits might also contribute to phase shift due to poorly by-passed circuit resistors.

This condition is seldom encountered in two-stage amplifiers. However, in units containing three or more stages the number of reactive components which might cause reversal at the extreme ends of the band increases considerably, resulting in a possibility

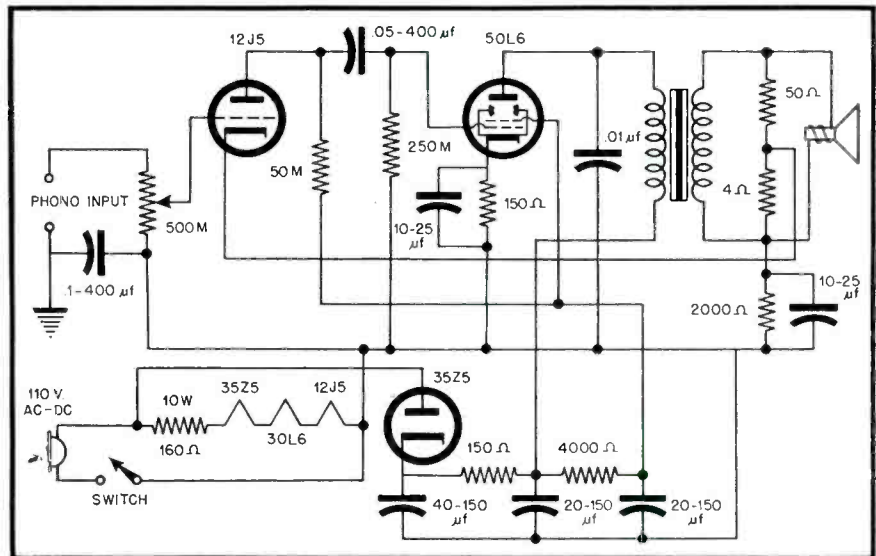


Fig. 7. AC-DC amplifier using negative feedback.

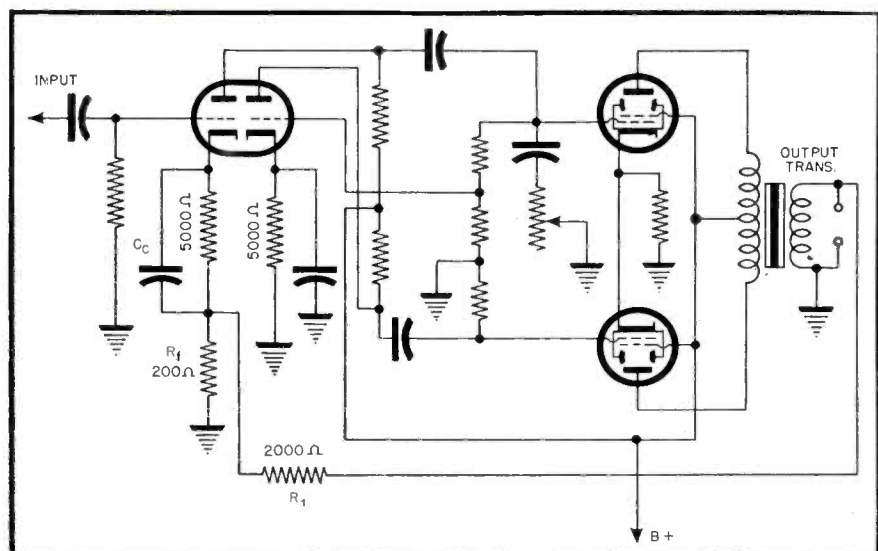
of audio regeneration at these frequencies.

Testing for Negative Feedback

Aside from quantitative tests that may be applied to negative feedback circuits, the quickest check on this

action is to turn up the amplifier until the volume is at a high level; then, disconnecting one of the feedback leads, the effect of its removal on noise, hum, and distortion, is observed. If negative feedback was present this effect will be noticeable.

Fig. 8. Phase inverter, push-pull amplifier using combined voltage and current feedback.



Next month's technical feature in "Radio Service Dealer" will be a study of the practical applications of oscillator, mixer and converter circuits.

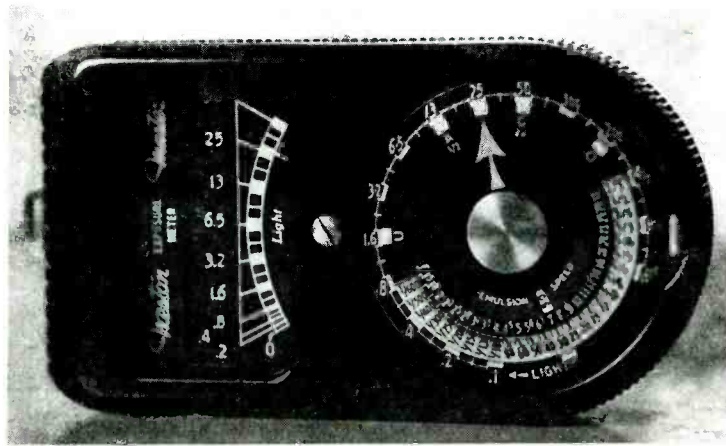


Fig. 1. Weston exposure meter using photocell and calibrated micromammeter.

SERVICE MARKET in Industrial Electronics

Radio servicemen located in industrial sections have within their "service areas" an ever increasing field of repair and maintenance business in the expanding field of industrial electronics.

by OSCAR E. CARLSON

E.S.M.W.T. Instructor, Temple University

ARTICLE 4.

PHOTOCELLS

The phototube discussed in part 3 of this series acted as a diode with the current flow for a given plate voltage dependent upon the light intensity and wavelength. Such a device acts as a variable resistance which offers nearly infinite impedance in darkness and a low resistance in light with-

in the visible and near visible spectrum.

The "Barrier" type photocell is a self contained photo-sensitive device which converts light energy directly into electrical energy. Such cells are often termed photo-voltaic cells and when subjected to light generate sufficient current to operate relays and meters directly without auxiliary power supplies.

Fig. 2. Principle of operation of barrier type cell. (Courtesy Selenium Corp. of America.)

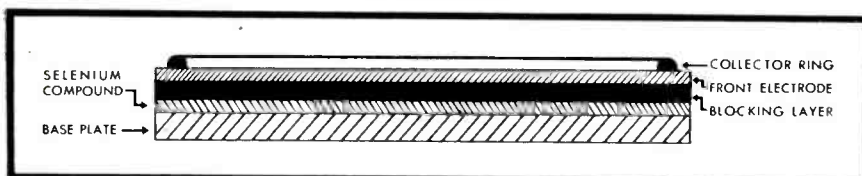


Fig. 1 shows a Weston Exposure Meter which makes use of such a cell and a micromammeter calibrated to read light intensity for photographic purposes.

Fig. 2 illustrates the principle of operation of the barrier type cell. Light striking upon the front electrode causes the barrier layer to emit photoelectrons which collect at the sprayed metal ring. When an electric circuit between the metal ring and the base plate is established a current flows through it. This current is proportional to the intensity of the light striking the front electrode. Such cells are capable of delivering high values of current without high values of illumination intensity with very little change in inherent stability. Fig. 3 illustrates the current characteristic for the Emby SS-1 type of photocell. Notice that a current of 100 microamperes and more is readily obtainable thru relatively low values of load resistance.

Fig. 4 shows the spectral response of the Emby SS-1 photocell in comparison to that of the human eye. The wavelength are herein given in millimicrons. A micron is a thousandth part of a millimeter or one millionth part of one meter. There are 10,000 microns to a centimeter. A millimicron is one thousandth of a micron. Thus a millimicron is one millionth part of a millimetre. Filters to remove the response to ultra-violet may be used so that the response closely duplicates that of the human eye.

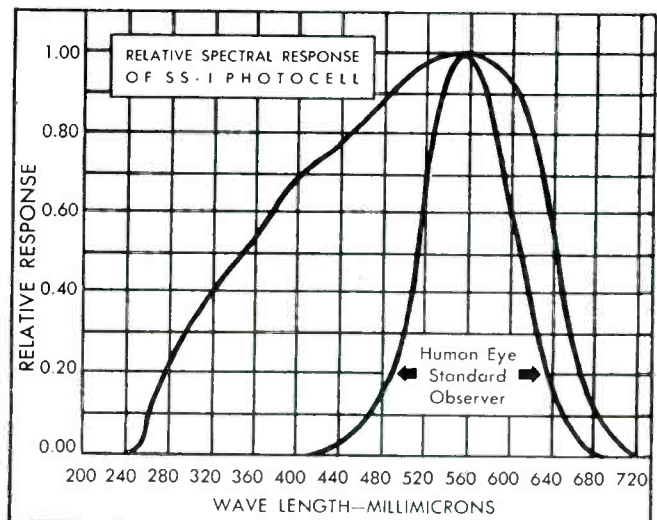
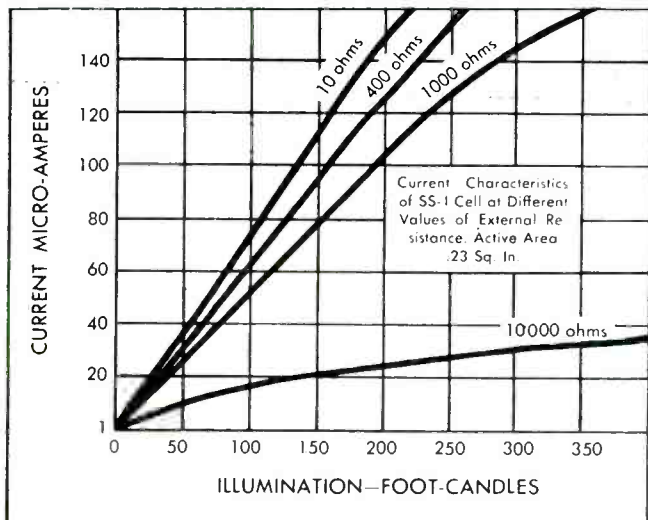


Fig. 3 (left). Current characteristics for the Emby SS-1 photocell.
 Fig. 4 (right). Spectral response of Emby SS-1 photocell compared to the human eye.

In colorimetric work, color measuring and comparing, a commercial light source varies so much in intensity that objective determinations become difficult. A balanced circuit may be used to overcome this difficulty. A simple circuit for general colorimeter work using a balanced circuit is shown in Fig. 5. This circuit is described by Wilcox in "Industrial Engineering Chemistry" edition of 1934. In this circuit the two variable resistors may be adjusted for zero current thru meter, G, with standard illumination and material to be color tested used on both cells as a light filter. Any deviation then of material color and density will cause a light differential and consequently a voltage difference across the two cells so that current will flow through the meter G. The standard color material may be kept over one cell and the matching material run past the second cell.

A device using such a photocell is in general industrial use for smoke control from industrial smoke stacks. This device, described in the *Aerovox Research Worker* for August and September 1941, may be used to cause automatic damper regulation for furnaces. Such an arrangement may be understood from reference to Fig. 6. Such a system may be used to actuate an alarm when excessive smoke is being produced by a furnace or actual automatic control may be attained. Automatic control of smoke density may be achieved by the use of amplifiers and thyatron or grid glow tubes after the amplifier. The light source of Fig. 6 delivers light to the photocell in inverse proportion to the smoke density. The photocell delivers a voltage across a load resistor in the input circuit of a DC amplifier. The amplifier may then be used to activate the alarm or control circuits in question.

Hundreds of other applications are to be found. Many of these require timing of operations and sequence of same. This then necessitates a knowledge of time and timing circuits.

TIME CONTROL CIRCUITS

A simple timing arrangement for long time intervals is for example the simple alarm clock. Here we may adjust for an occurrence to occur nearly 12 hours from the time we make the adjustment.

To time intervals and operations over intervals of seconds and perhaps minutes is done easier and more accurately by electronic means than by some "clock" mechanism method of time control of an occurrence.

A resistor, a capacitor and an electron tube form a combination capable of automatically timing almost any process. The time constant of a resistor and a capacitor is the time required for a current flowing in the circuit to fall to 0.37 of its initial value. Such is the case of capacitor discharge current flowing through fixed resistance. The time constant may be expressed as follows:

$$T = RC \text{ seconds} \quad (1)$$

where R is in ohms and C is in farads

Fig. 7 illustrates current decay in circuit of same figure for various values of load resistance for the capacitor. It is assumed that the capacitor had been fully charged from a DC source, the charging potential removed and the circuit shown established.

A capacitor may be charged with AC as you will remember from your grid leak and grid capacitor bias methods. Actually an AC source is used and the charge is such as to establish a DC potential across the capacitor.

[see page 36]

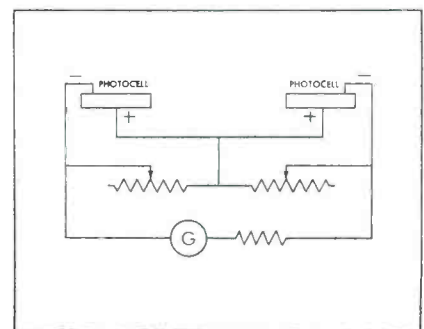


Fig. 5. Simple circuit for Colorimeter work.

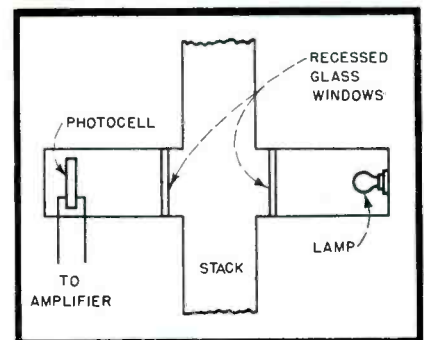
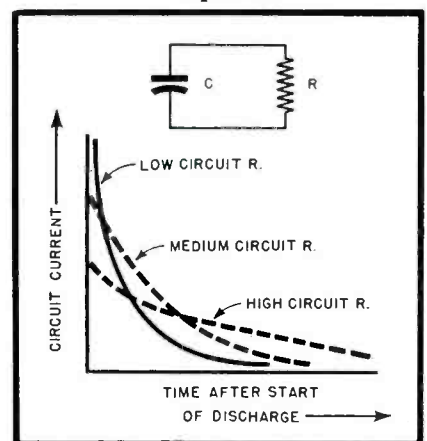


Fig. 6. Photocell application to automatic control for industrial stacks.
 Fig. 7 (below). Current decay for various values of load resistance for capacitor.



THE SERVICE BENCH

The service or repair bench itself should be given serious consideration. A well designed service bench not only *facilitates and promotes efficient repairs* but develops confidence on the part of the customer or dealer. The impression created by a well equipped, business-like appearing service department is inspiring and lasting and is certainly conducive to faith in the dealer. Certainly not the least of the results of a good service layout is the effect on the morale of the service department. If a serviceman has a well equipped and attractive shop and bench, he is proud of it, and he will take pride in the efficiency and quality of his work.

The illustration shows a carefully designed service bench which incorporates many desirable features, yet it is reasonably small and compact. Another illustration shows some of the general dimensions. One of the features of this bench is that no screws or bolts are used in its assembly, each section fitting the other like a block house. The two pedestal sections contain four drawers each; one with space

for tools, one for an assortment of small parts or hardware, another for larger parts, and also in each section a bottom drawer of the regular filing cabinet size for books and literature.

The work surface fits on top of the two pedestals and on the front contains electrical outlets for receivers under repair and a similar set of outlets on the rear for instruments, etc. This work surface section is the only section wired for AC power. All other equipments used on the bench plug into the rear outlets. The work surface is at a convenient normal height when the operator is standing. The surface is durable pressed wood which can be changed when worn.

The top section is located rigidly on the work surface by means of four dowels. It contains outlets along the bottom for antenna and ground connections. Two small compartments at each end provide convenient space for small tools, parts and special supplies. Three utility panels are used for special testing. The one on the left contains a small amplifier which may be used for testing record changers, loudspeakers, etc. The center panel con-

tains a loudspeaker which can be used for substitution purposes and which operates over a wide selection of input impedances. The right or power panel contains an isolation transformer (very necessary in the servicing of AC-DC receivers), a voltage control (which is used to test receivers under adverse line conditions) and two meters (AC voltage and current) which indicate the power consumption of a receiver under test.

On top of this section are placed the various test instruments such as Signal Generators, Oscilloscope, Vacuum Tube Voltmeter, etc., which are used on the radios in the normal servicing procedures. The height of the top section is such that all instruments are at a convenient eye level when standing. A high stool is recommended when the bench is being used continually.

This radio service bench represents a practical, time saving design that has been evolved from much experience and investigation. Wood was chosen as the construction material because of greater ease of building.

(See illustrations opposite.)

SYSTEM FOR YOUR SERVICE BENCH

by **D. H. KRESGE**

*Service Manager, Radio & Television
Bendix Radio Division of Bendix Aviation Corp.*

How to service new, complex receivers profitably.

Equipment used must be more accurate than the sets.

THERE is an old adage which says that "The quality of a man's work is no better than the tools he uses". One would hardly expect an inspector to check a precision machine tool with gages, the accuracy of which are poorer than the machine tool itself because with such equipment he could never hope to restore the tool to its original accuracy. Likewise, a radio technician cannot hope to restore the original accuracy of receiver functions

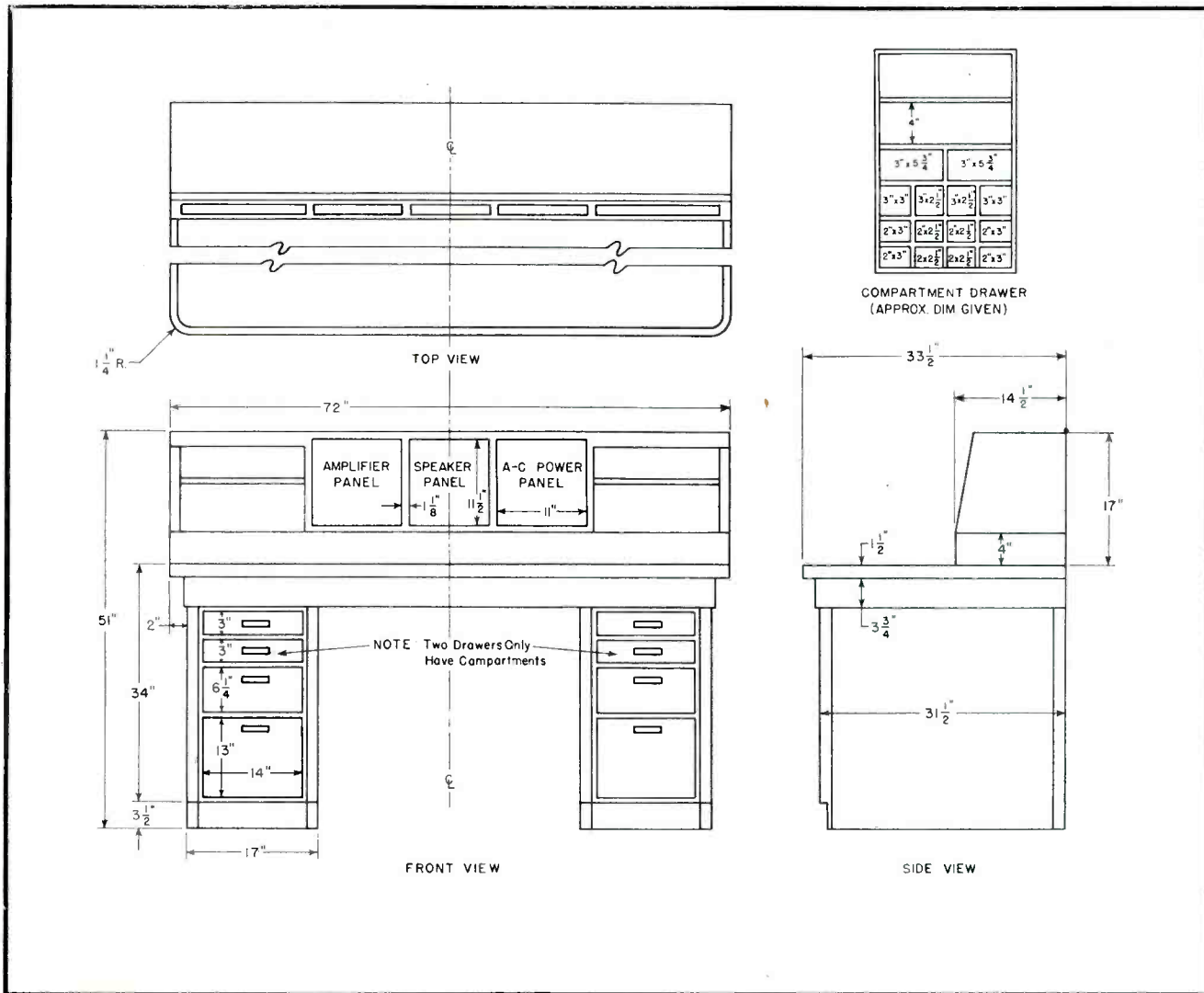
if his instruments are less accurate than the receiver, or if he has no instruments at all.

The new receivers will have many technical advantages over previous models and even greater advances are forthcoming in the near future. Therefore, it is imperative that each distributor be equipped technically to handle these receivers, and a descriptive list of equipment follows.

While listed as separate items, many

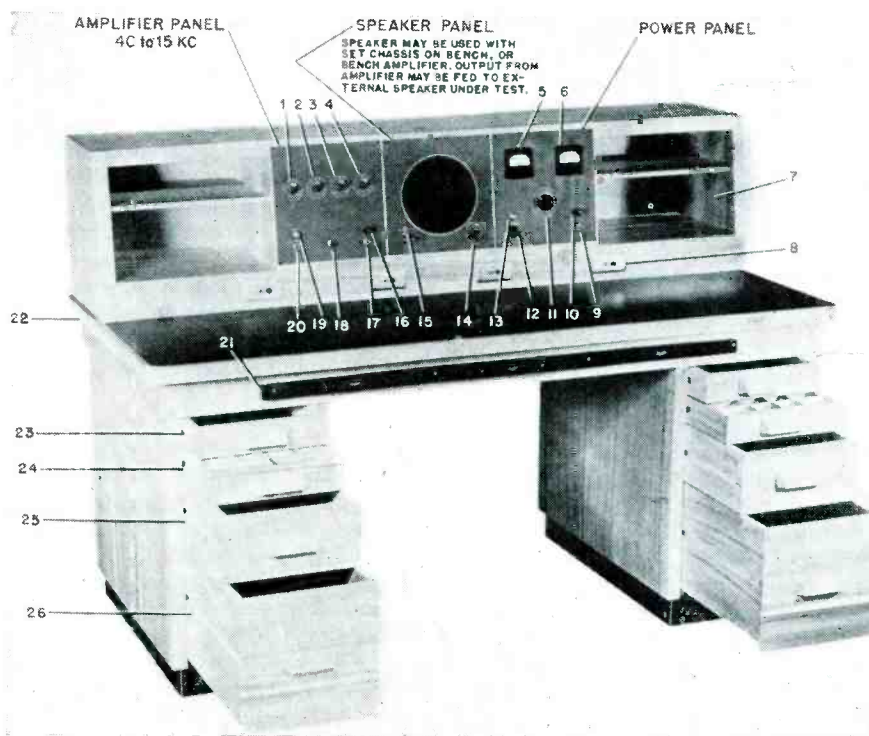
of the test instruments may, for technical or economic reasons, be combined into one unit. This list is intended to give the basic instrument requirements. It is not intended to fit any specific make or model of test equipment. Such technical specifications as are given here are those which would be given for each instrument under consideration and may be used to determine the qualities of that instrument.

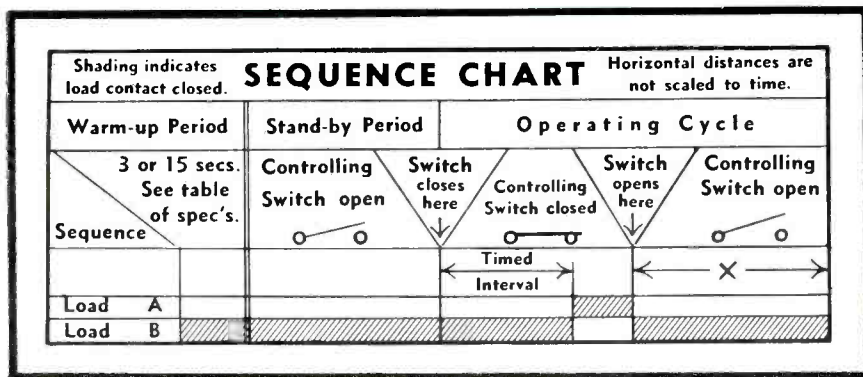
[see page 48]



General Dimensions of Service Bench

- 1 High gain control
 - 2 Low gain control
 - 3 (T) Tone control
 - 4 (B) Tone control
 - 5 Wattmeter
 - 6 Voltmeter
 - 7 Storage compartment, tools and parts
 - 8 Ant-Gnd plates
 - 9 On-off switch
 - 10 Fuse
 - 11 Voltage control
 - 12 AC socket
 - 13 Pilot light
 - 14 Impedance matching switch
 - 15 Ext.-int. sw.
 - 16 Fuse
 - 17 On-off switch
 - 18 Pilot light
 - 19 Low level input
 - 20 High level input
 - 21 AC power strip, 6 connections (Pierceway)
 - 22 AC power strip (on rear) to instruments and connections
 - 23 Tool drawer
 - 24 Small parts drawer
 - 25 Large parts drawer
 - 26 Filing cabinet size drawer
- Bench table of pressed plywood overlay
- Bench panel top of 1/8" hard aluminum





[Courtesy Fisher Pierce Co.]

Fig. 10. Sequence chart for switching operation of circuit shown in Fig. 9.

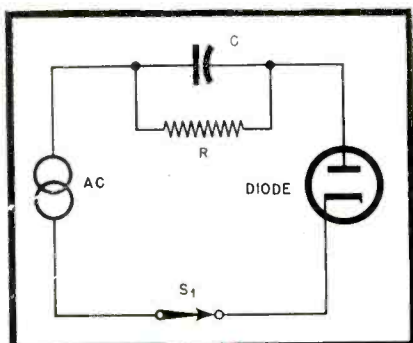


Fig. 8. Rectifier circuit of the half-wave type.

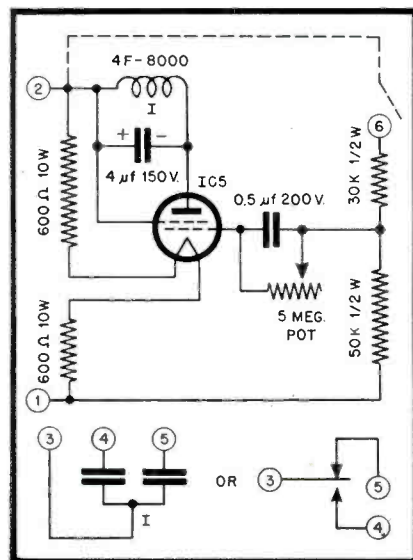


Fig. 9. Type 1C5 tube in automatic timing circuit.

Fig. 8 illustrates how such a circuit may be used. This simple circuit is essentially a rectifier circuit of the half wave type. This circuit may be duplicated when using the grid of a triode or other tube as the anode for the rectifier circuit. Either applied AC or DC will result in a voltage developed across the capacitor. On AC the capacitor will charge on the half cycles during which the grid capacitor connects to the positive line. On DC the positive line must connect to this same side.

Fig. 9 illustrates the use of a type 1C5 type tube in an automatic timing circuit. This circuit operates from either 115 volts AC or DC. This circuit allows a sequence of operations so with the control switch open the load contacts for section B of the relay are closed. Upon closing the control switch the B contacts remain closed and contacts A open until a time later determined by the time constant of the grid leak resistor and capacitor. The resistor is made variable so that this time may be varied. At this time A closes and B opens. When the control switch is again closed the circuit reverts immediately to A open and B closed.

Fig. 10 illustrates the above sequence. Both Figs. 9 and 10 are by courtesy of Fisher Pierce, makers of Electronic Timers. In this circuit of Fig. 9 the relay coil is energized by the plate current flowing in the vacuum tube plate circuit on each positive half of the AC plate potential. The 4 mfd. 150 volt capacitor across the relay coil tends to keep the relay current constant by supplying a current out of phase with the current flowing as a function of plate current. Closing the control switch between terminals 2 and 6 allows the control grid of the tube to become biased negative, thus reducing plate current to a minimum below that value at which the relay is energized. Opening this switch allows the plate current to increase as the bias decreases until a value sufficient to again energize the relay is reached.

This and other more complicated timing circuits are based on the same fundamental principles as outlined herein. Part 5 of this series will deal with the Ignitron type electron tube and resistance welding.

Bibliography: Capacitors in Control Circuits—Aerovox Research Worker, August 1942. Emby Photo Electric Cells (Booklet)—Selenium Corp. of America. Fisher Pierce Electronic Timers—(Bulletin 4505).

G. E. EXPANDS ELECTRONICS HEADQUARTERS

A university of industry will begin to rise shortly on 155 acres of ground outside Syracuse, N. Y., as the General Electric Company begins the construction of its new \$10,000,000 electronics headquarters plant.

Laid out and landscaped like a college campus, the new plant will be known officially as General Electric's "Electronics Park." Here employees will work under the most modern conditions in well-lighted, air conditioned factory buildings and offices, surrounded by an inspiring park-like atmosphere and reached by modern highways leading to and through the plant. Every modern facility for safe and efficient manufacturing operations also will be available. Floor area involved will be in excess of one million square feet. Buildings to be constructed include reception, administration, laboratory, transmitter, receiver, specialty, restaurant, service, boiler house and a substation.

Electronics Center

From this G.E. Syracuse electronics center will flow to the United States and the world a myriad of products which will help bring about that new world of tomorrow—television, frequency modulation radio and wire recording for entertainment and education; radar for safety at sea and in the air; two-way radio for emergency communications for buses, taxi, construction jobs, forest rangers, campers, etc., to mention but a few. From here will develop other new applications of this bright new electronics science which will turn a wealth of war-won knowledge into practical peacetime products.

The new plant will house the main manufacturing units of the G.E. Electronics Department. Other manufacturing units of the department will continue operating at Buffalo, Utica and Schenectady, N. Y.; at Wabash, Indiana; at Owensboro and Bowling Green, Ky.; and Tell City, Indiana.

Bright Future

Electronics has a bright future, Dr. W. R. G. Baker, G.E. vice president, explains, because it is a branch of

[see page 44]

SERVICE DATA SENTINEL RADIO

for

MODELS 284W, 2841, 284N1, 284NA, IU-284W IU-2841, IU-284N1, IU-284NA

VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE ON EITHER:
110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT (AC)
OR
110-120 VOLTS DIRECT CURRENT (DC)

If the radio does not operate on direct current after approximately one minute, remove the plug on the end of the radio line cord from the power receptacle, turn it half away around (180°) and re-insert it into the receptacle.

LOOP AERIAL

THE LOOP AERIAL SUPPLIED with the radio should provide ample reception in average locations.

Loop aeriels are directional—the volume of a weak station may be improved, or undesired electrical noise may be reduced, by lifting and turning the radio to a different position. A trial will reveal position of best reception with least interference.

OUTSIDE AERIAL

If the radio is used in shielded areas or located a great distance from broadcast stations, the volume of some or all stations may not be ample, in which case it would be necessary to ATTACH A 25-50 ft. OUTDOOR AERIAL TO THE BLUE LEAD COMING OUT OF THE REAR OF THE CHASSIS.

GROUND

When a regular aerial is used, best result will be obtained with a ground attached to the black lead coming out of the rear of the chassis.
WARNING — DO NOT ATTACH A GROUND DIRECT TO THE RADIO CHASSIS—ANY EXTERNAL GROUND CONNECTION TO ANY METAL PART OF THE CHASSIS WILL CAUSE A SHORT AND POSSIBLE DAMAGE.

FUNCTION OF CONTROLS ON RADIO

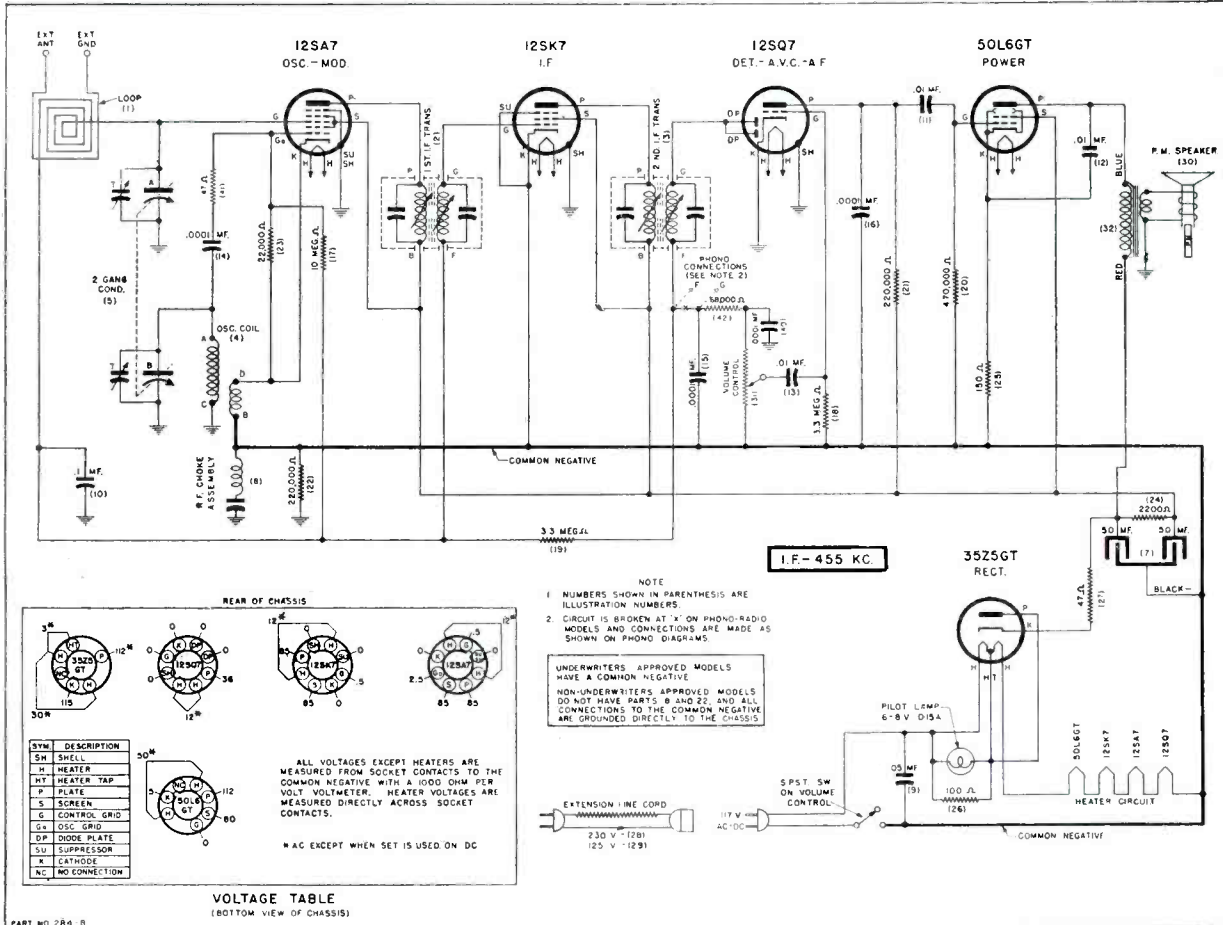
THE RIGHT HAND KNOB controls the volume control and off-and-on switch.
THE LEFT HAND KNOB is the station selector.

OPERATING INSTRUCTIONS

PLACE VOLUME CONTROL KNOB IN one-half to maximum volume position.
TURN TUNING CONTROL KNOB until the desired station is heard with greatest volume and clearest tone.

DIAL LIGHT

It is normal for the dial light to be dim for approximately 60 seconds after set is turned "on" and then attain normal brilliance—also, on very loud signals the light may fluctuate.
Always use a 6.3 volt .150 ampere dial light.



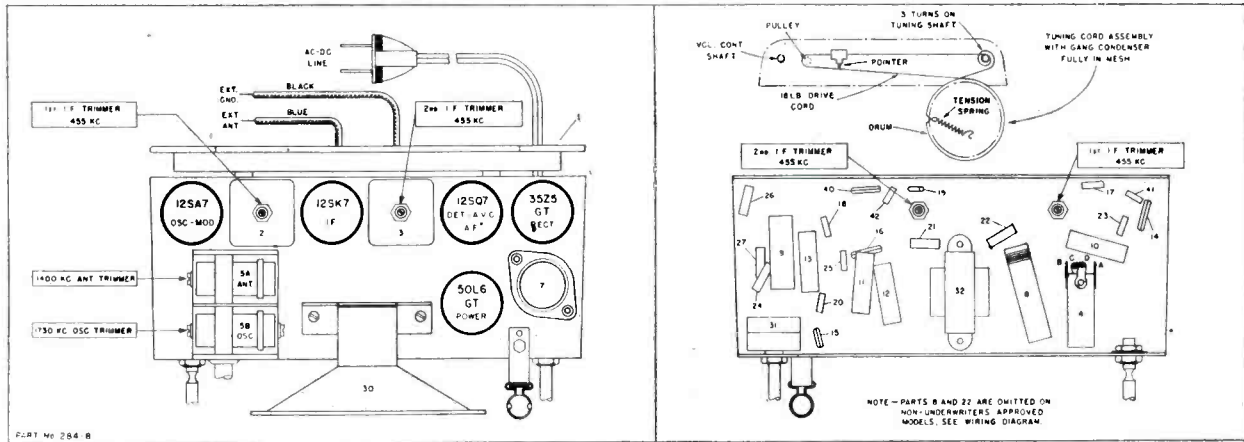
ALIGNMENT PROCEDURE

For alignment procedure read tabulations from left to right, and make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

- (a) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.
- (b) Use an accurately calibrated test oscillator with some type of output measuring device.
- (c) PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

Steps	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
1	Any point where no interfering signal is received.	455 K. C.	.02 MFD. condenser	High side to front stator plates of tuning condenser. Low side to frame of condenser through a .02 Mfd. blocking condenser.	Adjust each of the second I. F. transformer trimmers for maximum output—then adjust each of the first I. F. trimmers for maximum output.
2	Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD. condenser	Receiver blue antenna lead Receiver black ground lead	Adjust 1730 K. C. oscillator trimmer for maximum output.
3	Approx. 1100 K. C.	Exactly 1100 K. C.	.00025 MFD. condenser	Receiver blue antenna lead Receiver black ground lead	While racking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.



PARTS LIST

III. No.	Part No.	Part Name	Description	III. No.	Part No.	Part Name	Description
1	20E24	Antenna	Loop	19	27E335	Resistor	Carbon, 3.3 Megohm 1/3 Watt
2	20E21	Coil	1st I.F. Transformer	20	27E474	Resistor	Carbon, 470,000 Ohm 1/3 Watt
3	20E22	Coil	2nd I.F. Transformer	21	27E224	Resistor	Carbon, 220,000 Ohm 1/3 Watt
4	20E13	Coil	Oscillator	22	27E224	Resistor	Carbon, 220,000 Ohm 1/3 Watt (Und. Appd. Only)
5	24E2	Condenser	Tuning, 2 Gang (3 Hole Mtg.)	23	27E223	Resistor	Carbon, 22,000 Ohm 1/3 Watt
5	24E18	Condenser	Tuning, 2 Gang (2 Hole Mtg.)	24	27E222-2	Resistor	Carbon, 2,200 Ohm 1/2 Watt
7	25E1	Condenser	Dry Electrolytic, 50-50 Mfd. 150 V.	25	27E151	Resistor	Carbon, 150 Ohm 1/3 Watt
8	20E75	Choke	R.F. Choke Assembly (Und. Appd. Only)	26	27E101	Resistor	Carbon, 100 Ohm 1/3 Watt
9	23E416	Condenser	Tubular, .05 Mfd. 400 Volts	27	27E470-2	Resistor	Carbon, 47 Ohm 1/2 Watt
10	23E218	Condenser	Tubular, .1 Mfd. 200 Volts	28		Resistor	230 Volt Extension Line Cord Used in models not Underwriters Apprd.
11	23E211	Condenser	Tubular, .01 Mfd. 200 Volts	29		Resistor	125 Volt Extension Line Cord Used in models not Underwriters Apprd.
12	23E211	Condenser	Tubular, .01 Mfd. 200 Volts	30	1E9	Speaker	5" PM
14	23E39	Condenser	Mica, .0001 Mfd.	31	28E1	Volume Control	With S.P.S.T. Switch
15	23E39	Condenser	Mica, .0001 Mfd.	32	22E2	Transformer	Output for Speaker
16	23E39	Condenser	Mica, .0001 Mfd.	40	23E39	Condenser	Mica, .001 Mfd.
17	27E106	Resistor	Carbon, 10 Megohm 1/3 Watt	41	27E470	Resistor	Carbon, 47 Ohm 1/3 W.
18	27E335	Resistor	Carbon, 3.3 Megohm 1/3 Watt	42	27E683	Resistor	Carbon, 68,000 Ohm, 1/3 W.

MISCELLANEOUS PARTS

Part No.	Part Name	Description	Part No.	Part Name	Description
7E31-1	Cabinet	Walnut Plastic	68E1	Dial Shaft	Drive Shaft
7E31-2	Cabinet	Ivory Plastic	19E3	Dial Shaft	Bearing For Drive Shaft
7E1-1	Cabinet	Catalin Plastic	35E8	Dial Pointer	Dial Indicator
7E70	Cabinet Back	For Catalin Cabinet	65E2	Dial Spring	Tension Spring For Drive Cord
7E32	Cabinet Back	For Walnut & Ivory Plastic Cabinets	37E17-1	Knob	For Walnut Cabinet
41E1	Cord	6 Ft. Rubber Line Cord	37E17-2	Knob	For Ivory Cabinet
20E12	Dial Plate Assem.	Dial Back Plate Assem. Less Scale	37E29-1	Knob	For Catalin Cabinet
4E1	Dial Cord	30' of 18 Lb. Dial Drive Cord	20E43	Pilot Lamp Socket	Pilot Lamp Socket Assembly
9E2	Dial Crystal	Acetate Dial Crystal	40E1	Pilot Lamp	6-8 Volt .150 Amp. Type 47 Lamp
36E10	Dial Scale	Calibrated Scale			

SERVICE DATA

RCA MODEL 55U, 55AU VICTROLA

RCA VICTOR DIVISION—RADIO CORP. OF AMERICA

Chassis No. RC-1017, Mfr. No. 274

Electrical and Mechanical Specifications

REFER TO SERVICE NOTE T-960015 FOR
INFORMATION ON RECORD CHANGER

FIVE-TUBE, SINGLE-BAND, SUPERHETERODYNE RECEIVER

FREQUENCY RANGE..... 540-1,600 kc
INTERMEDIATE FREQUENCY..... 455 kc

TUBE COMPLEMENT

(1) RCA-12SA7..... 1st Det.—Osc.
(2) RCA-12SK7..... I-F Amplifier
(3) RCA-12SQ7..... 2nd Det., A.V.C., and A-F Amplifier
(4) RCA-50L6-GT..... Power Output
(5) RCA-35Z5-GT/G..... Rectifier

POWER OUTPUT

Undistorted..... 1.5 watts
Maximum..... 2.4 watts

LOUDSPEAKER (M92279-1) "PM"

Size..... 4 x 6 inch elliptical
V.C. Impedance..... 3.4 ohms at 400 cycles
Some models may have..... 5 inch PM

POWER SUPPLY RATING

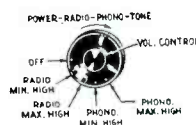
105-125 volts, AC, 60 cycles..... 60 watts

IMPORTANT.—Do not plug chassis into a d.c. power supply.

	Height	Width	Depth
Cabinet dimensions (inches).....	10 $\frac{1}{2}$	17 $\frac{1}{4}$	17 $\frac{1}{4}$
Chassis overall (inches).....	6 $\frac{3}{4}$	14	6 $\frac{1}{4}$
Chassis base (inches).....	1 $\frac{1}{8}$	14	3 $\frac{3}{4}$
Tuning Drive Ratio.....			15:1

PHONOGRAPH

Type..... Automatic (T960015)
Record Capacity..... Twelve 10-in., Ten 12-in.
Turntable Speed..... 78 r.p.m.
Type Pickup..... Crystal
Motor Power Consumption..... 25 watts



Replacement Parts

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
	CHASSIS ASSEMBLY (RC 1017)		
70389	Bearing—Tuning knob shaft bearing	70388	Shaft—Tuning knob shaft
70407	Button—Plug button (2 required)	34449	Socket—Lamp socket
70997	Capacitor—Ceramic, 5.6 mmf. (C24)	35787	Socket—Phono input socket
39650	Capacitor—Mica, 820 mmf. (C15)	37605	Socket—Tube socket—moulded
70601	Capacitor—Tubular, .002 mfd., 400 volts (C5, C9)	70390	Spring—Drive cord tension spring
70606	Capacitor—Tubular, .005 mfd., 400 volts (C1, C11)	70396	Spring—Volume control gear tension spring
70611	Capacitor—Tubular, .02 mfd., 400 volts (C8)	70394	Switch—Power or radio phono switch (S1)
70612	Capacitor—Tubular, .025 mfd., 400 volts (C10)	70386	Transformer—First I.F. transformer (L6, L7; C20, C21)
70615	Capacitor—Tubular, .05 mfd., 400 volts (C2, C14)	70387	Transformer—Second I.F. transformer (L8, L9; C22, C23; C6, C7)
70617	Capacitor—Tubular, 0.1 mfd., 400 volts (C3, C4)	70385	Transformer—Output transformer
70408	Capacitor—Electrolytic comprising 1 section of 30 mfd., 150 volts and 1 section of 50 mfd., 150 volts (C12, C13)	33726	Washer—"C" washer for tuning knob shaft
70403	Coil—Oscillator coil	70406	Washer—Spring washer for volume control
70383	Condenser—Variable tuning condenser complete with drum (C18, C16)		SPEAKER ASSEMBLY 922279-1
70322	Control—Volume control, 0.5 megohms (R10)	70405	Speaker—4" x 6" P.M. speaker complete
32634	Cord—Drive cord (approx. 48" overall length)		NOTE: If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
70392	Cord—Power cord		MISCELLANEOUS ASSEMBLIES
70384	Drum—Drive drum	X1635	Board—Baffle board and grille
70397	Gear—Power or radio-phono switch gear	70398	Clamp—Dial clamp (1 set)
70395	Gear—Volume control gear and spring assembly	35392	Decal—Trademark decal (RCA Victor)
70404	Indicator—Station selector indicator	70575	Decal—Trademark decal (Dog)
70301	Insulator—Bakelite insulator for phono input socket	70402	Dial—Dial scale
11765	Lamp—Dial lamp	70707	Hinge—Cabinet lid hinge (2 required)
70393	Loop—Antenna Loop (L1, L2)	70401	Knob—Power or radio-phono switch knob
70382	Plate—Dial back plate complete with pulleys less dial	70400	Knob—Tuning knob
30868	Plug—2 contact female plug for AC cable	70399	Knob—Volume control knob
36230	Pulley—Drive cord pulley	14270	Spring—Retaining spring for tuning knob and volume control knob
30880	Resistor—150 ohms, 1/4 watt (R7)	30545	Support—Lid support
6134	Resistor—1200 ohms, 1 watt (R9)		
30492	Resistor—22,000 ohms, 1/4 watt (R2)		
14583	Resistor—220,000 ohms, 1/4 watt (R1, R5)		
30648	Resistor—470,000 ohms, 1/4 watt (R8)		
12928	Resistor—3.3 megohm, 1/4 watt (R4)		
31455	Resistor—5.6 megohm, 1/4 watt (R6)		
14974	Screw—#8-32 x 3 1/16" long set screw for lower gear		

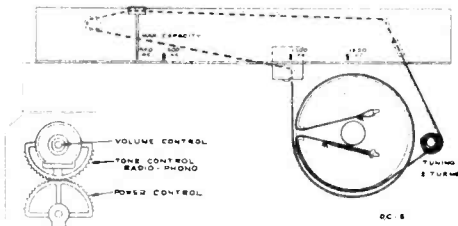
Alignment Procedure

CAUTION.—CLOSE TUNING CONDENSER PLATES COMPLETELY (C-C-W) BEFORE REMOVING CHASSIS FROM CABINET.

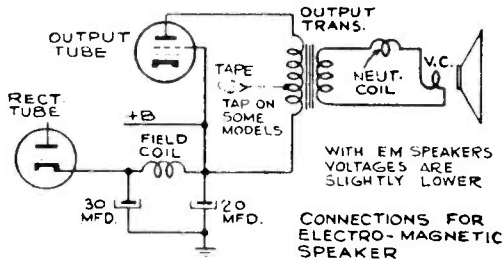
Take off both wooden strips on bottom of cabinet by removing wood screws before loosening chassis bolts.

CRITICAL LEAD DRESS.—

1. All filament wires should be dressed close to chassis.
2. Dress lead from switch to phono jack close to chassis and away from power cord.
3. Dress capacitor between 12SQ7 grid and terminal board away from chassis and away from other parts.
4. Dress all exposed leads away from each other and away from chassis to prevent short circuits.
5. In instrument assembly the lead from the rear section of gang to loop shall be dressed away from chassis and other wires to loop.



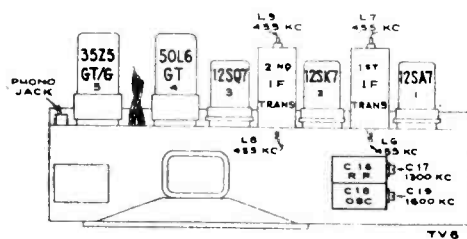
Dial Pointer Adjustment.—Rotate tuning condenser fully counter-clockwise plates (fully meshed). Adjust indicator pointer to left (max. cap.) mark on dial back plate.



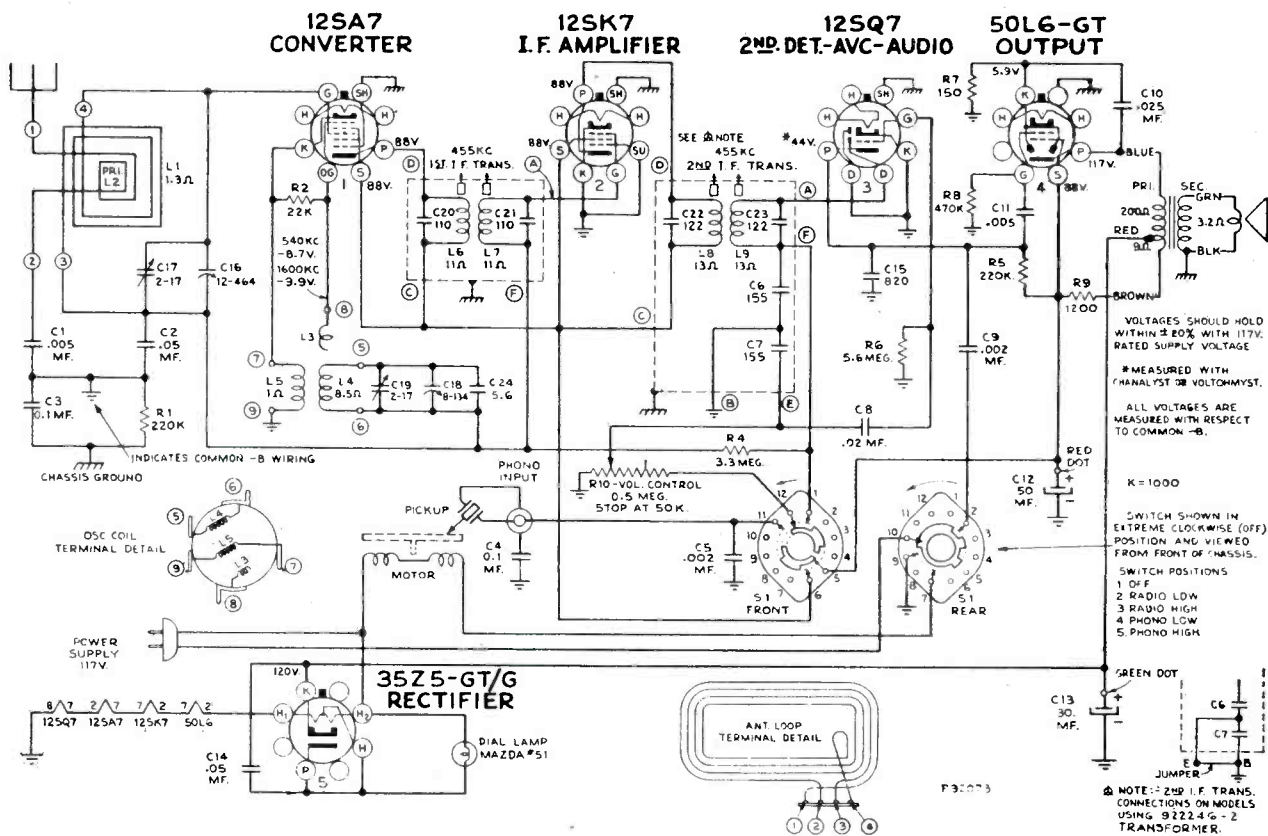
Test Oscillator.—Connect high side of test oscillator as shown in chart. Connect low side through a .01 mf capacitor to common "—B". Keep the output signal as low as possible to avoid a.v.c. action.

Output Meter.—Connect meter across speaker voice coil. Turn volume control clockwise to radio maximum high position (3) for alignment.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I.F. grid, in series with .01 mfd.	455 kc	Quiet point 1,600 kc end of dial	L8 and L9 2nd I.F. transformer
2	1st Det. grid in series with .01 mfd.			L6 and L7 1st I.F. transformer
NOTE.—ANTENNA LOOP MUST BE IN CABINET				
3	Antenna terminal in series with 220 mmfd.	1600 kc	Gang at minimum	C19 (osc.)
4	Radiated signal 1300 kc		Signal Frequency	C17 (ant.)
5	Repeat steps 3 and 4.			

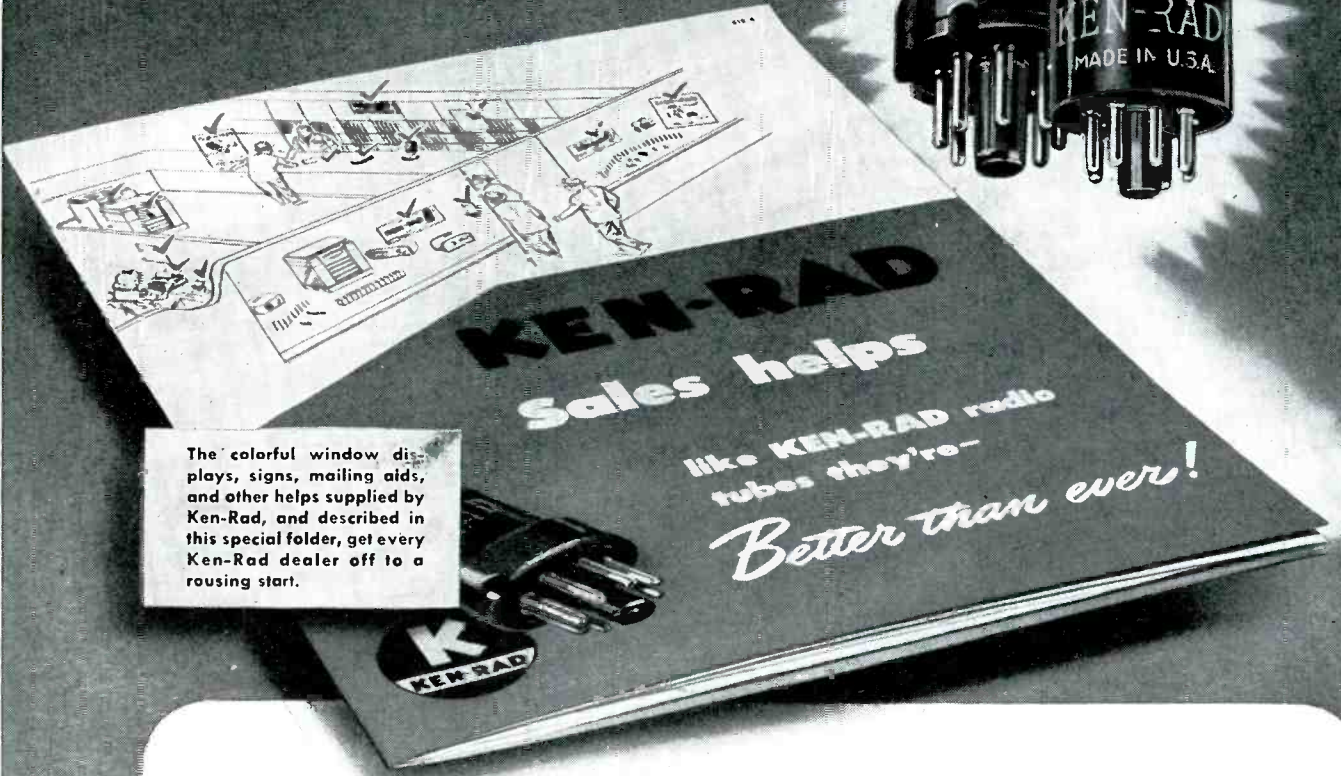


Power Supply.—Although this model employs an ac-dc chassis, it is not suitable for use on d.c., as this would damage the motor. Reversal of plug in outlet receptacle may reduce hum.



KEN-RAD

RADIO TUBES



The colorful window displays, signs, mailing aids, and other helps supplied by Ken-Rad, and described in this special folder, get every Ken-Rad dealer off to a rousing start.

You'll make more money as a Ken-Rad tube dealer —because **KEN-RAD SHOWS YOU HOW!**

From the moment you decide to handle Ken-Rad radio tubes, help is freely extended so that your business may prosper. Lessons learned "the hard way" by other tube dealers guide *you* along the path to profits! Ample Ken-Rad display material identifies your store as Radio Tube Head-

quarters. Tested shop forms and technical tube data aid you to organize efficiently. In these and other ways Ken-Rad, keenly interested in your success, backs you up with active help, with seasoned counsel, and—most important of all—with a tube product which is outstandingly *better than ever*.

Write for your copy of "Essential Characteristics", the most complete digest of radio tube information available.

176-EI-6850

KEN-RAD

DIVISION OF GENERAL ELECTRIC COMPANY
OWENSBORO, KENTUCKY

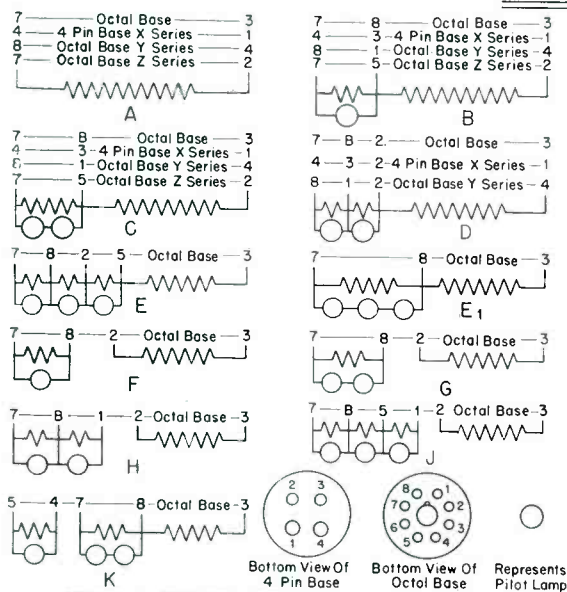
BALLAST TUBE & PLUG-IN RESISTOR CHART

The third of a series of Charts, invaluable to technicians, containing important, time-saving data on new standards, codes, etc.

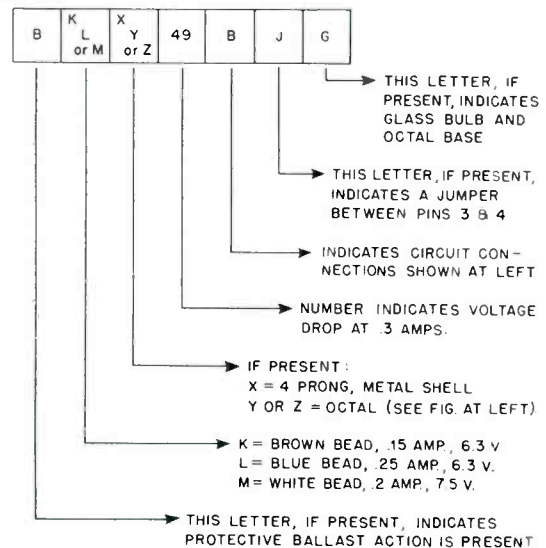
RADIO SERVICE DEALER, FEB. 1946

COPYRIGHT 1946, COWAN PUB. CORP.

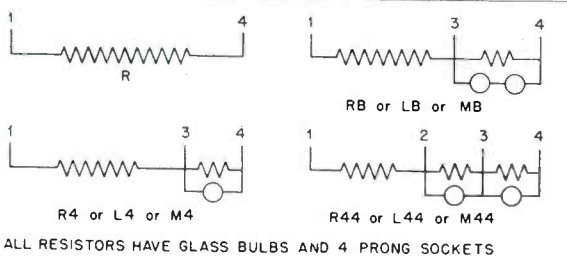
R.M.A. DESIGNATIONS



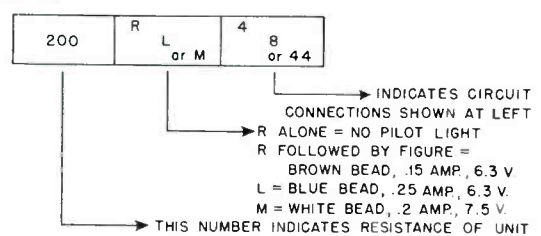
EXAMPLE:



SYSTEM A



EXAMPLE:

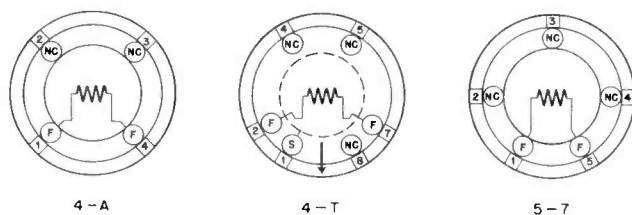


SYSTEM B

SYLVANIA DESIGNATIONS

CHARACTERISTICS

TYPE	USE	MA LOAD CURRENT	AVERAGE VOLTAGE DROP *	BULB	BASE
1A1/5E1	Battery	500	1.0	ST-12	4-A
1B1	Battery	360	1.0	ST-12	4-A
1C1	Battery	745	1.0	ST-12	4-A
1D1	Battery	240	1.0	ST-12	4-A
1E1	Battery	480	1.0	ST-12	4-A
1F1	Battery	720	1.0	ST-12	4-A
1G1	Battery	420	1.0	ST-12	4-A
1J1	Battery	620	1.0	ST-12	4-A
1K1	Battery	550	1.0	ST-12	4-A
1R1G	Battery	540	1.0	ST-12	4-T
1T1G	Battery	560	1.0	ST-12	4-T
1X1	Battery	780	1.0	ST-12	4-A
1Y1	Battery	540	1.0	ST-12	4-A
1Z1*	Battery	900	1.0	ST-12	4-A
2	DC or AC-DC	300	9.0	S-14	4-A
3	DC or AC-DC	300	128.0	ST-16	4-A
4	DC or AC-DC	400	115.0	ST-16	4-A
5	DC or AC-DC	460	115.0	ST-16	4-A
6	Battery	685	1.0	ST-12	4-A
7	DC or AC-DC	300	176.0	ST-16	4-A
8	DC or AC-DC	300	132.0	ST-16	4-A
9	DC or AC-DC	300	50.0	ST-16	4-A
46A1	DC or AC-DC	400	46.1	ST-12	5-7
46B1	DC or AC-DC	300	46.1	ST-12	5-7



BASE VIEWS

NOTE:

GROUP 1A1/5E1 TO 1Z1 IS EMPLOYED IN BATTERY RECEIVERS - GROUP 2 TO 46B1 IS EMPLOYED IN AC-DC RECEIVERS.

* The voltage drop shown is for average operation and may vary according to the supply voltage.

Specified

BY AMERICA'S MOST CRITICAL SERVICE ENGINEERS



TYPE BT INSULATED Metallized RESISTORS TYPE BW INSULATED Wire Wound RESISTORS

... the perfect combination for speedy, dependable servicing!

Almost any piece of carbon is a "resistor". But a really good resistor, scientifically designed to meet every requirement of exacting radio and other electronic servicing, is something else again. For example, users of the famous Type BT have found that IRC's exclusive Metallized filament-type construction is a far cry from ordinary resistors. Since the beginning of Radio, this unique design principle has made possible far greater stability, more rugged construction and complete dependability in a very compact, low-cost unit.

Now, two new BT types, the BTS and BTA, are available. Designed to meet all the exacting requirements of modern servicing, they are conservatively rated at 1/2 watt and 1 watt, respectively, and incorporate all the excellent characteristics of older, larger types in a much smaller, more convenient size.

For greater stability and all-around efficiency in the lower ranges, the IRC Type BW Insulated Wire Wounds are recommended. A stock of these units and the Type BT in assorted ranges and wattages give you the ideal combination to solve almost any servicing problem... quickly and profitably.

The Resistor You Need . . . When You Need It!

Your local IRC Distributor now has quite complete stocks of BT's and BW's, in standard RMA ranges, ready for you. You'll find him a dependable source (and a very cooperative guy) for all of the IRC products shown on this page. He'll also be glad to give you your copy of IRC Service Catalog #50.

FOR BETTER-THAN-STANDARD QUALITY

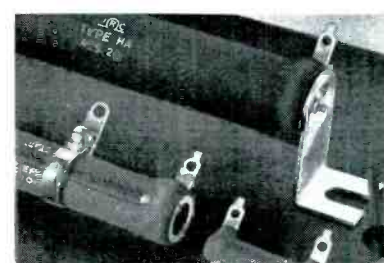
Standardize on



INTERNATIONAL RESISTANCE CO.

Dept. 22-B, 401 N. Broad Street, Phila. 8, Pa.

Makers of more types of resistance units, in more shapes, for more applications, than any other manufacturer in the world.



A GUARANTEED GHIRARDI MONEY-MAKER FOR EVERY SERVICEMAN WHO VALUES HIS TIME

The one SURE way to make more money is to equip yourself to repair more radios in the same amount of time — and that is exactly what Ghirardi's famous RADIO TROUBLESHOOTER'S HANDBOOK is absolutely guaranteed to do. If you don't agree that it does, simply return the book in 5 days. Every cent of your money will be refunded and no questions asked!

There's no magic about it — just plain, common sense. Over 400 pages of this big 744-page, manual-size Handbook contain carefully-indexed listings of the common Trouble Symptoms, their causes and Remedies for 4800 receiver, auto radio and record changer models of 202



manufacturers. Ghirardi passes on to you the priceless servicing knowledge and experience obtained from thousands of hours of tedious troubleshooting and repair work on all these receivers. Actual shop tests have shown that 4 jobs out of 5 can be solved simply by looking them up in the HANDBOOK. Unnecessary, tedious testing is eliminated. Your service work is made EASIER . . . and you handle at least two jobs in the time normally required for one!

In addition, 300 pages contain service hints; i-f alignment peaks for over 20,000 superhets; transformer trouble data; the finest tube information you've ever seen; and hundreds of helpful graphs, diagrams, charts, color codes, etc. — all carefully indexed so you can find them QUICK. Hundreds of users say the HANDBOOK has paid for itself on the very first job! Send coupon today. You cannot lose!

CUTS TIME IN HALF on 4 jobs out of 5

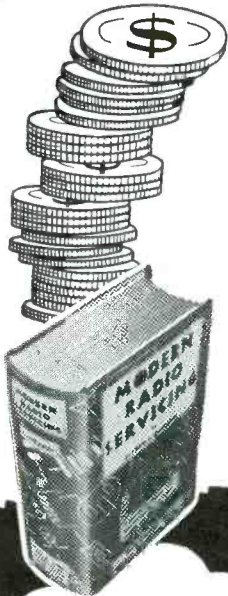
STOP GUESSING MISTER!

Where will you be when service competition gets really tough again? And what will be your status when the big-pay repair jobs on Television, FM, Facsimile, Sound and Industrial Electronic equipment begin coming along in a big way? Scientific modern training such as A. A. Ghirardi gives you in the two big books shown here is the answer — AND IT'S THE ONLY ANSWER. Maybe you've been too busy to study much recently — BUT NOW IS THE TIME TO BEGIN! It will count heavily in your earnings during the next few years.



GET WHERE THE BIG MONEY IS!

Know how to make preliminary trouble checks on complicated jobs? Know how to analyze any circuit and its components quickly and scientifically? Know exactly where, when and how to use all types of test instruments — and how to interpret their readings to track down the trouble? Only by truly professional ability of this sort can you hope to qualify for the big-money work — and especially on complicated new FM and Television receivers. Nowhere else can you get such training faster, easier and at less cost than in Ghirardi's 1300-page MODERN RADIO SERVICING. This big, profusely illustrated book brings you full data on modern methods, refreshes you on any type of work that may prove puzzling, prepares you for the rich opportunities that only servicemen having the true "Know How" of their profession can grasp. Everything is explained simply and thoroughly so you will understand it easily and quickly. \$5 complete — on our 5-DAY MONEY-BACK GUARANTEE OFFER.



5-DAY MONEY-BACK GUARANTEE

MURRAY HILL BOOKS, INC., Dept. RSD-26
232 Madison Ave., New York 16, N. Y.

- Enclosed find \$..... for books checked; or
- send C.O.D. (in U.S.A. only) for this amount plus postage. If not fully satisfied, I may return the books within 5 days for complete refund.
- RADIO TROUBLESHOOTER'S HANDBOOK \$5 (5.50 foreign)
- MODERN RADIO SERVICING HANDBOOK \$5 (5.50 foreign)
- MONEY-SAVING COMBINATION OFFER: Both big books — over 2040 pages — only \$9.50 for the two (\$10.50 foreign)

Name

Address

City & Dist. No. State

MONEY-SAVING OFFER

Make your service library complete — get both of the above big books — over 2040 pages of the finest service data money can buy — only \$9.50 for the two. Use coupon

Electronics Center

[from page 36]

science like chemistry. As chemistry is not limited to plastics or synthetic rubber, neither is electronics limited to radio, communications or radar. It will contribute to numerous fields and in some cases create new industries, like television, for example.

G.E. will be a large contributor to this new billion dollar electronics peacetime industry spurred on by the war. The company produced many hundred millions of dollars worth of radar war equipment alone, not to mention other electronics products. Although the wartime level will be reduced considerably, G.E. is looking forward to a tremendous peacetime expansion in this field.

Aside from the tremendous potential business represented in the strictly entertainment and communications side of electronics, it will expand in industrial use through power rectification, inspection of materials and products, control of various operations, heating of metals and other applications.

And as in the X-ray machine, electrocardiograph to study heart action, and electroencephalograph to study the brain, electronics will help improve man's physical welfare.

Mallory Tropical Dry Battery

This is an entirely different kind of dry cell originally developed by P. R. Mallory & Co., Inc., Indianapolis, for the armed forces, and now available commercially as an "A" battery for hearing aids. Cell operates through chemical reaction of zinc and mercuric oxide whereas most commercial dry cells use zinc and carbon.

Potential Uses: The battery shows great promise as a source of power for pocket radios, hearing aids, communications equipment and for other electronic devices.

Retail price schedules for the Mallory battery have not yet been established. The price per cell will be somewhat higher for Mallory cells than for typical zinc-carbon cells but the cost per milliamper hour of service will be competitive.

Other Mallory products are: Resistors, volume controls, vibrators and vibrator power supplies, switches, electrolytic capacitors, noise filters, rectifiers and power supplies, electrical contacts and contact assemblies, resistance welding alloys, electrodes and accessories, and special metallurgical products.

Stock only **4** AUTO-RADIO VIBRATOR MODELS!



4 Vibrator Models cover 95% of all auto-radio replacement demand! Faster Turnover... Greater Profits

Think of it! To serve the 1122 auto-radio models comprising 95% of the replacement demand, you need stock only 4 models of E-L Vibrators. This is a *real standardization plan* that means increased profits for E-L dealers and distributors. Save on shelf space too! Not only fewer models to stock but E-L Vibrators are smaller in size than other makes as well.

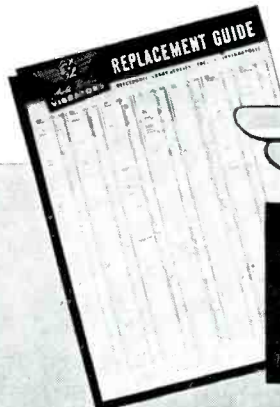
33% Longer Life

E-L engineers devoted many months of thorough research to determine the exact requirements of auto-radios... and adapting to them E-L models whose design and exclusive features have been proved in the toughest of proving grounds... military service.

These E-L Vibrators synchronous and non-synchronous are of balanced resonance construction designed especially for heavy duty service. Tests show that they provide 33% longer vibrator life, with output and starting voltages held virtually constant at all times.

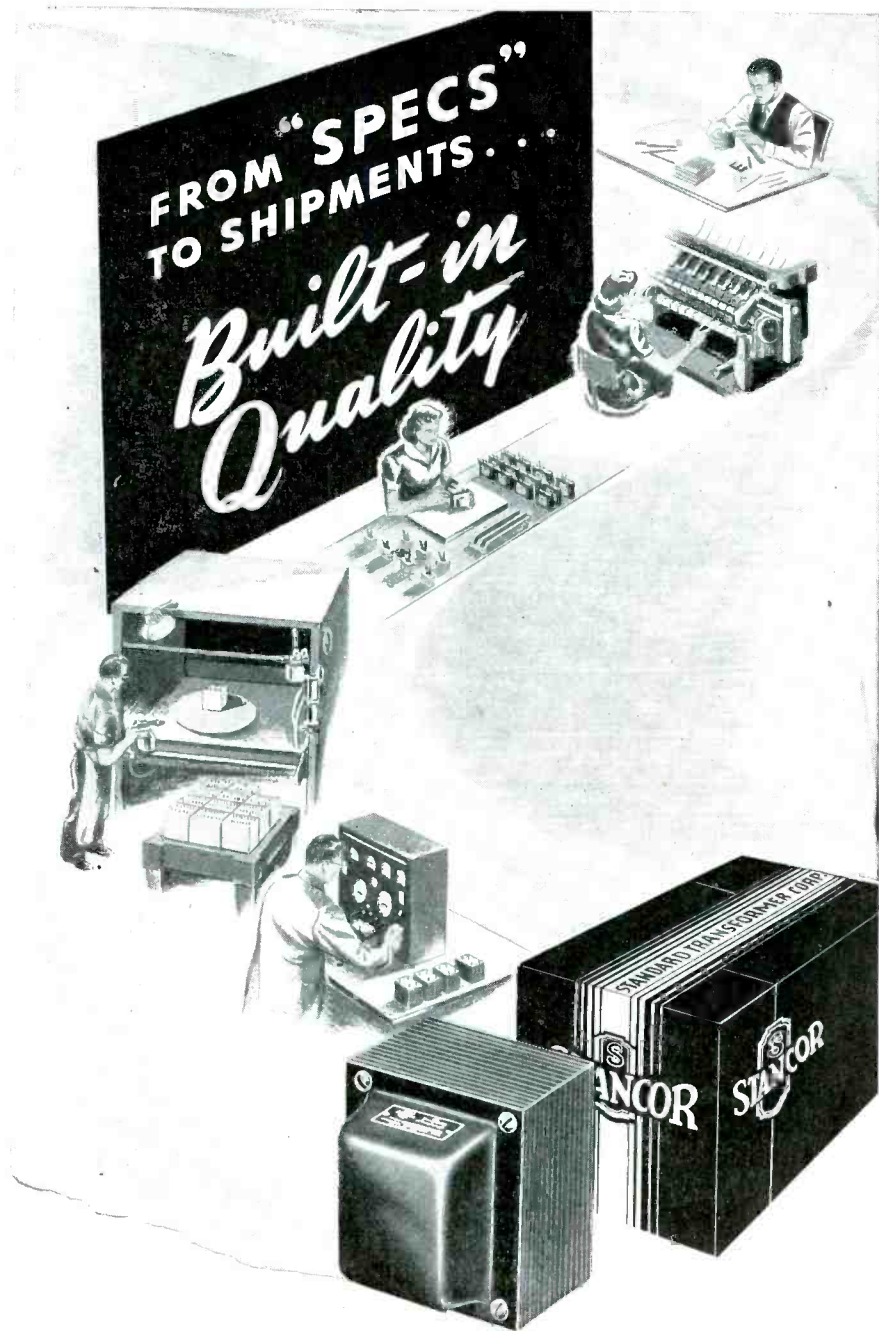
See Your E-L Distributor

With your order, you'll receive your copy of the new E-L Auto-Radio Vibrator Replacement Guide. Designed to hang on your wall, it will tell you instantly which E-L Vibrator to use for most auto-radios as far back as 1936. See your E-L distributor!



Electronic
LABORATORIES, INC.
INDIANAPOLIS

VIBRATORS AND VIBRATOR POWER EQUIPMENT FOR LIGHTING, COMMUNICATIONS, ELECTRIC AND ELECTRONIC APPLICATIONS



Radio servicemen, amateurs and electronic engineers have long demanded durable transformers with versatile adaptability. Stancor has consistently met these demands with manufacturing products with highest quality materials and workmanship in each separate production operation . . . engineering, coil-winding, laminating, assembling, finishing, testing and final packaging.

Today over 80% of all Universal Power Transformers now in use are replaceable with a Uni-dapt Stancor catalog item. For all transformer replacements, think first of Stancor.



STANCOR
STANDARD TRANSFORMER CORPORATION
1500 NORTH HALSTED STREET CHICAGO 22, ILLINOIS

TELEVISION CUSTOMERS

[from page 23]

build confidence in this new medium, and programs that will create the desire to own a television receiver, are "musts" if television is to go ahead on the scale we believe it can.

Sales

Annual sales of 5,000,000 receivers at an average price of \$200, within five years of 1946, are the opportunity television presents to men of vision.

In concluding, I would like to paraphrase Clifford Rohe's essay on "Youth," with the following entitled, "Television and You."

Yours has been the youth of television—not a time of life—but a state of mind. It is not a matter of atomic bombs nor the temper of steel, but a product of imagination, a vigor of the emotions; it is a freshness of the deep springs of life.

Television, like youth, calls for continued predominance of courage over timidity; of appetite of achievement over love of complacency. Nobody grows old merely living a number of years. People grow old only by a desertion of their ideals. This we know in our hearts you'll never do. Concern, doubt, self-distrust, even fear and despair, are the long, long years that bow the head and may turn the vibrant spirit back to dust.

Whether sixty or sixteen, there is in every being's heart the love of wonders, such as television, the sweet amazement of the stars and starlike things and thoughts of tomorrow, the undaunted challenge of events, the unflinching childlike aptitude for what is new, midst the joy of living.

You, as a leader of men, are as young as your faith, as young as your confidence in the good of the new—never as old as despair. In that central palace of your heart there is a wireless station, so long as it receives messages of beauty, hope, cheer, courage, grandeur and power from the earth, from men and from the Infinite, so long are you young with us, in television. If ever the wires are all down and all the central palace of your heart is covered with the soft snows of pessimism, and there enters an iota of the ice of cynicism, then you are grown old indeed, and may the Lord have mercy on your soul.

In our minds, with the inspiration of television you will never grow old—television as a service to the people transcends all else in the material hope of mankind for good-will among men and nations.



Dominant *Quality*

With **WARD PRODUCTS CORPORATION**, the word *quality* is more than just a symbol. It represents the highest standard of excellence and leadership achieved through many years' experience in the *exclusive* manufacture of precision-built antennas. **WARD** antennas are built by master craftsmen using the most modern equipment under ideal conditions. Top quality through and through, they render highest efficiency for all automobile and home radio applications. That's why **WARD** is "first choice" the *world* over.

Only WARD Gives You All These Important Features

- ★ Easy One Man Installation
- ★ Patented Fluid Type Anti-Rattle Construction
- ★ Positive Silver-to-Silver Contacts
- ★ Extra Heavy Triple Chrome Rust-proof Plating
- ★ Top Section, Stainless Steel
- ★ Heavy Admiralty Brass Tubing
- ★ Hi-Q Detachable Low Loss Lead-ins With Polyethylene Insulation and Vinylite Covering
- ★ Complete with all Fittings and Conversion Kit for Torpedo Bodies
- ★ Smooth Action Telescoping Sections
- ★ 100% Shielded

World's Finest for Car and Home Combining Precision and Streamlined Beauty

WARD "Hi Q" *Antennas*

THE WARD PRODUCTS CORPORATION
1523 East 45th Street
CLEVELAND 3, OHIO

EXPORT DEPT. C.O. Brandes, Mgr., 4900 Euclid Ave., Cleveland 3, Ohio
IN CANADA-Atlas Radio Corp., 560 King St., W., Toronto, Ont., Canada

System for Your Service Bench

[from page 34]

I. EQUIPMENT FOR SERVICING AM BROADCAST AND SHORT WAVE RECEIVERS

A. Essential Equipment

1. Analyzer or Volt-Ohm-Milliammeter

- a. This instrument should measure DC voltages up to at least 5,000 volts at not less than 20,000 ohms per volt.
- b. It should measure AC volt-

- ages up to at least 5,000 volts at not less than 1,000 ohms per volt.
- c. It should serve as an output meter.
- d. It should measure current up to at least 2 amperes.
- e. It should measure resistance up to 10 megohms.
- f. Its accuracy should be approximately 2% on DC ranges and 5% on AC ranges.

2. R.F. Signal Generator

- a. This instrument should have a range of from 100 KC to 30 MC.
- b. Its accuracy of calibration should be 1% or better.
- c. Its maximum output should be at least 1 volt.
- d. It should have internal audio modulation of reasonable accuracy.
- e. It should have attenuation variable over $\frac{1}{2}$ to 100,000 microvolts with 10% accuracy.
- f. An output measuring device, such as a Vacuum Tube Voltmeter, is desirable as part of this instrument.

3. Oscilloscope

- a. Should be wide range, modern design, preferably with a 5" tube. (A scope suitable for servicing broadcast receivers will not necessarily be satisfactory for television servicing.)

4. Capacity Meter or Bridge

- a. Capable of measuring all capacities from .0002 to 200 mfd.
- b. Should be capable of measuring electrolytic capacitor leakage.
- c. It should be capable of measuring power factor.

5. Tube-Tester

- a. Capable of handling all modern tubes.

6. Audio Oscillator

- a. Should have range from 25 to at least 10,000 cycles per second. (15,000 cycles minimum FM requirement.)
- b. Should have low distortion and good output.

7. Crystal Calibrator

- a. 100 KC and 1,000 KC fundamentals.
- b. Reliable harmonics up to 20 MC.

8. Line Isolation Transformer

- a. 1:1 Ratio 115 Volts 100 Watts (minimum rating)

9. Line Voltage Control

- a. Range 100 to 130 Volts

10. AC Line Voltmeter

- a. Range 0 to 150 Volts

The above list gives the base requirements for a shop in which one or two men are employed. Item No. 1 should be duplicated for each man. Item No. 2 should be duplicated for each 2 men. Other items may be duplicated as the operation warrants.

[see page 52]



**BROAD RANGE SELECTION
IN A POCKET-SIZE INSTRUMENT**

WESTON
MODEL 564—TYPE 3-C
VOLT-OHMMETER

An extremely compact WESTON quality instrument with a broad selection of resistance and DC voltage ranges. Ranges available from pin-jacks molded internally with the panel, a toggle-switch connecting meter in circuit as a Voltmeter or Ohmmeter. Readily adjusted for variations in battery potential. For full details on Model 564, and on WESTON Ohmmeters and Volt-Ohm-Milliammeters, send for literature. Weston Electrical Instrument Corporation, 605 Frelinghuysen Avenue, Newark 5, New Jersey.

WESTON Instruments

It was a heck
of a note!



IN some types of old-style dial lights, the vibrations from certain resonant frequencies whipped the filament off its supports. General Electric Research Engineers took high-speed movies and discovered that filaments sometimes vibrated in one direction while the support wires vibrated in the opposite direction. By making filament and support vibrate in unison, they eliminated one of the main causes of early lamp failure in this type of service.

This is just one of many examples of how G-E Lamp Research constantly has improved the quality and serviceability of G-E Miniature Lamps. Features like these make it worth your while to sell G-E Lamps:

1. Dependable, trouble-free performance.
2. High level of maintained light output.
3. Low current consumption.
4. Long life.
5. Profitable to handle.
6. Greater dealer acceptance.

GENERAL  ELECTRIC

DEALER SALES

[from page 19]

not mentioned, such as flat irons, roasters, toasters, coffee makers, room heaters, sun and heat lamps, lighting lamps and fixtures—here is an annual market, for some years, of a total of more than 2 billion dollars a year in utilization devices alone.

It's hard to say how many earn or hope to earn their livelihood in the distribution, sale and service end of home appliances waiting for normal production of these peacetime products. Many of these are war veterans—these and many more can be classed

as small business. Most of them employ salesmen and service men. All own or rent stores, operate cars and trucks.

Truly, this is a business that means and will mean much in comfort and convenience of everyday living—but also in the volume of business and the employment of our people that mean so much to the health of our economy.

It seems to me important that I should say to you that this story about the building of a great industry and the forecast of its future could not have been told had it not been for an industry-wide job of promotional selling, advertising and publicity which has brought out the desirability and economy of the broadened use of electricity in our homes.

In Trade

[from page 16]

which has been retarded by a shortage of certain components, is expected to increase sharply with a few months. The manufacture of parts for "hams" has been well under way since late fall in the National's Malden plant.

Radio Price Regulation Amended

The radio price regulation has been changed in several minor respects, without any significant change in the consumer price level. The action, effective January 26, 1946, has instituted these three changes:

1. Raised by one dollar the cut-off point defining the upper limit of the medium price range.

The low, medium and high ranges are based on manufacturers' pre-war prices to wholesalers, and the medium range has been from \$11 to \$30 at the manufacturing level. Each price range has its separate resale mark-up, to be applied by the manufacturer for purposes of preticketing with the retail price, as required by the regulation. The mark-up is substantially higher on high priced sets than on medium priced sets, and as a result, consumer ceilings broke off at about \$58, with the next higher price about \$65.

The familiar price of \$59.95, frequently used before the war for sets in one popular quality class, was therefore eliminated, and it has seemed desirable to restore the \$60 radio to the retail market.

2. Stated specifically that manufacturers of sets for export or for sale by a mail order house need not preticket these sets with the retail price. It was never intended that they should be, but specific authorization to omit the tag was not heretofore included.

3. Set specific mark-ups over manufacturer prices for sales by mail order houses distributing under their own brand names. Heretofore mail order house owners of brand names were required to apply individually to OPA for ceiling prices on sales of the sets specially manufactured for them.

The mark-ups are slightly lower than those applicable to sales by other types of retail outlets, to reflect pre-war differentials between mail order house and other retail prices for special brand radios. (Amendment No. 1 to Maximum Price Regulation No. 599 and Order No. 1 under Section 211 of Maximum Price Regulation 599—both effective January 26, 1946.)

[see page 56]



50 WATTS OF TRULY RATED POWER OUTPUT

Incorporating latest circuit designs

DELIVERY NOW

At Ice Palaces, Industrial Plants, Race Tracks, Music Festivals, Football and Baseball Stadia, you'll always satisfy them with sound by Masco.

Model MA-50 Amplifier operates 2 to 12 speakers. Other features include individual bass and treble equalizers; 2 high impedance microphone inputs and one for phono pick-up; dependable performance that has stood the test of years; excellent tonal quality; designed for long hour usage; tapped output; safety fused.

List Price

Model MA-50 Amplifier with streamline cover, less tubes. 100.00
Kit of Matched Tubes for above. 17.50

MARK SIMPSON MANUFACTURING CO.

MANUFACTURERS OF

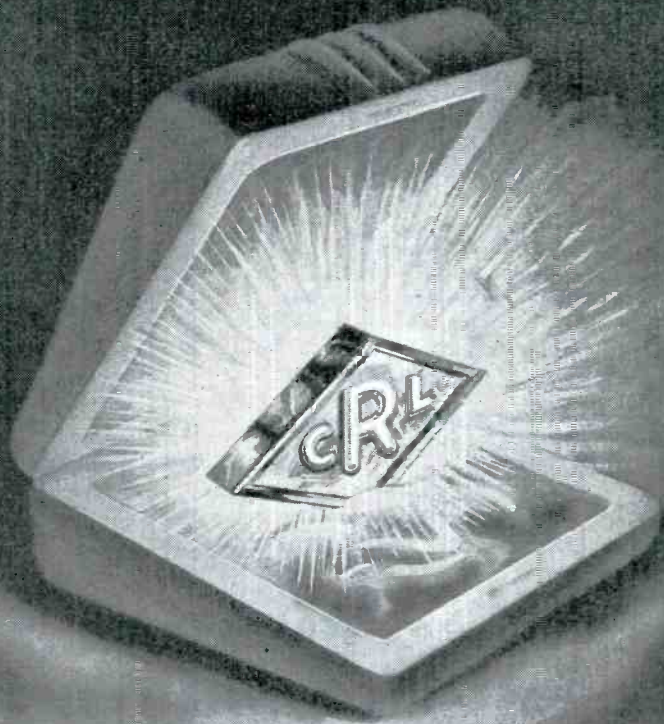
Masco Sound Systems and Accessories

186-194 WEST FOURTH STREET :: NEW YORK 14, N. Y.

Telephone CHelsea 2-7112-3-4



The Mark of Quality



The initials "CRL" in the Diamond stand for Centralab

They are an integral part of the Centralab name, and for more than a quarter of a century have represented the utmost in engineering skill and precision . . . the height of manufacturing perfection.

Both in original equipment and in replacements, the symbol "CRL" is the Mark of Quality.

. . . Always specify Centralab.

Ceramic High Voltage Capacitors
Bulletin 814

Centralab

Division of GLOBE-UNION INC., Milwaukee

PRODUCERS OF

Ceramic High Voltage Capacitors
Bulletin 814



Ceramic Trimmers
Bulletin 625



Variable Resistors
Bulletin 697



Tubular Ceramic
Capacitors
Bulletins 630
and 586



Selector Switches
Bulletin 722

System for Your Service Bench

[from page 48]

B. Equipment valuable in increasing efficiency of a Broadcast Receiver Service Department but not necessarily essential

1. **Vacuum Tube Voltmeter**
 - a. Preferably one with both AC and DC ranges.
2. **Wattmeter**
 - a. 115 Volt 300 Watt Range
3. **Small Audio Amplifier and Speaker**
 - a. Should have excellent response. Could be constructed by radio technician.
4. **Regulated Power Supply**
 - a. 300 Volt 150 to 200 Ma.
 - b. 6.3 V at 6 to 10 Amp. or several separate windings. Could be constructed by radio technician.
5. **Sweep Generator**
 - a. With sweep width 0 to 30 KC Minimum. Variable sweep width is desirable. (May be built into oscilloscope or signal generator.)
6. **Adjustable Lamp or Lamps**
 - a. For service bench

II. ADDITIONAL EQUIPMENT FOR SERVICING FM RECEIVERS*

A. Essential

1. **H.F. Signal Generator**
 - a. Ranges up to 110 MC.
 2. **Sweep Frequency Generator**
 - a. Sweep plus or minus 200 KC minimum.
- Items 1 and 2 may be combined in one unit.

B. Valuable but not Essential

1. *Set of absorption wave meters covering FM frequencies.*

III. ADDITIONAL EQUIPMENT FOR SERVICING TELEVISION RECEIVERS*

A. Essential

1. **H.F. Signal Generator**
 - a. Range up to 110 MC.
2. **Sweep Frequency Generator**
 - a. A variable sweep capable of sweeping at least ± 5 MC on any television channel.

Items 1 and 2 may be combined on one unit.

3 Oscilloscope

- a. Y-Axis Amplifier Frequency Response

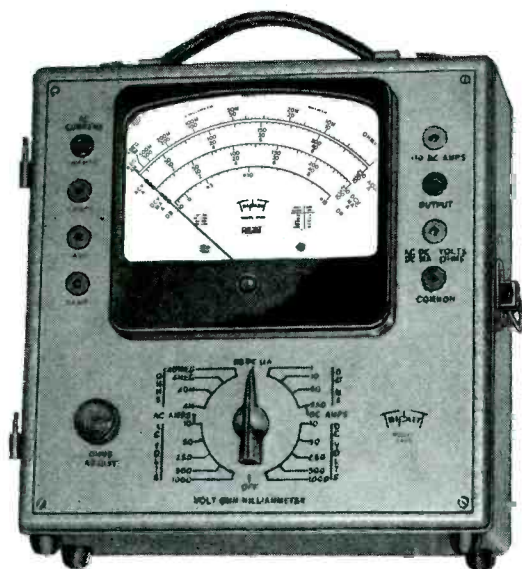
- Uniform within 3 db from 25 cps to 3.0 mc.
- b. **X-Axis Amplifier Frequency Response**
 - Uniform within 3 db from 20 cps to 100 kc.
- c. **Z-Axis Amplifier** (not necessary but desirable for substitution purposes)
 - Frequency Response
 - Uniform within 3 db from 0 cps to 4.5 mc. (0 response being accomplished by DC reinsertion).
- d. **Sweep**
 - Continuous from 20 cps to 30,000 cps.
 - With suitable sync. arrangement
- 4. *Set of absorption wave meters covering Television Frequencies.*

*These instruments may be chosen so as to serve both FM and Television Servicing.

B. Valuable but not Essential

1. *Video frequency generator or*
2. *Square Wave Generator*
 - a. Of value only to the technician capable of using it.

It is, of course assumed that the necessary small tools are supplied, such as screwdrivers, pliers, cutters, wrenches, soldering irons, etc.



NEW ENGINEERING • NEW DESIGN • NEW RANGES 30 RANGES

- Voltage: 5 D.C. 0-10-50-250-500-1000 at 25000 ohms per volt.
- 5 A.C. 0-10-50-250-500-1000 at 1000 ohms per volt.
- Current: 4 A.C. 0-.5-1-5-10 amp.
- 6 D.C. 0-50 microamperes — 0-1-10-50-250 milliamperes—0-10 amperes.
- 4 Resistance 0-4000-40,000 ohms—4-40 megohms.
- 6 Decibel -10 to +15, +29, +43, +49, +55
- Output Condenser in series with A.C. volt ranges.

Model 2400 is similar but has D.C. volts Ranges at 5000 ohms per volt.

Write for complete description

MODEL 2405

Volt•Ohm•Milliammeter

25,000 OHMS PER VOLT D.C.



SPECIFICATIONS

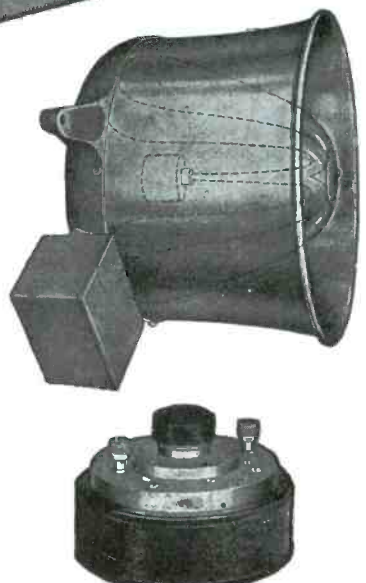
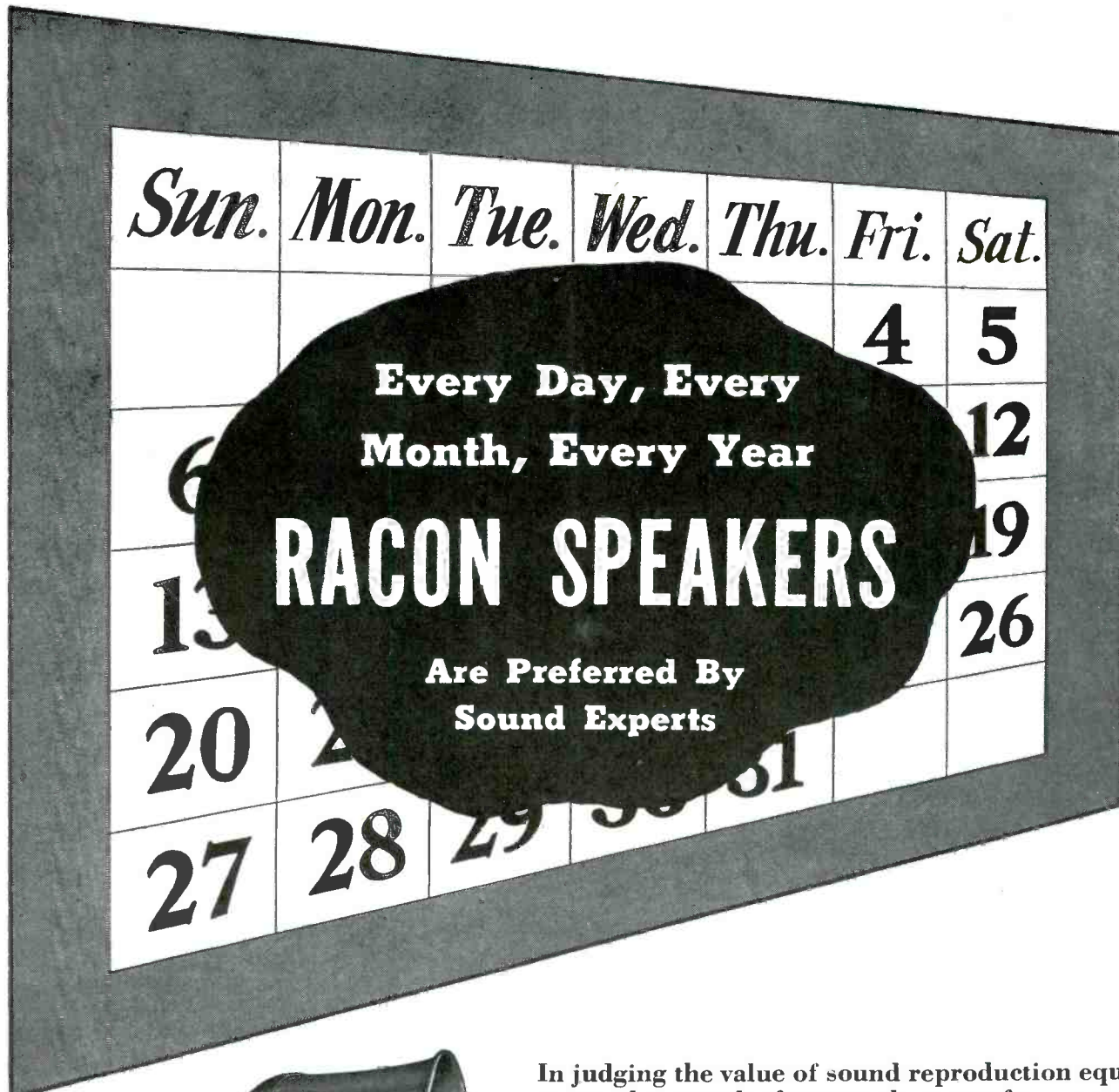
NEW "SQUARE LINE" metal case, attractive tan "hammered" baked-on enamel, brown trim.

- **PLUG-IN RECTIFIER**—replacement in case of overloading is as simple as changing radio tube.
- **READABILITY**—the most readable of all Volt-Ohm-Milliammeter scales—5.6 inches long at top arc.
- **RED•DOT LIFETIME GUARANTEE** on 6" instrument protects against defects in workmanship and material.

Triplett

ELECTRICAL INSTRUMENT CO.

BLUFFTON, OHIO.



The RACON Marine Horn Speaker is used both as a loudspeaker and as a microphone. Approved by the U. S. Coast Guard for all emergency loudspeaker systems on ships. A double re-entrant type speaker, completely waterproofed and weatherproof. Ideal for general P.A. and Marine use. Several sizes available. RACON Permanent Magnet Horn Units are available in operating capacities of from 10 to 50 watts.

In judging the value of sound reproduction equipment, the month-after-month, year-after-year dependability and efficiency of loudspeakers are prime considerations along with fidelity, output and initial cost.

RACON has never compromised with quality. RACON Speakers and Driving Units are recognized as the standards by which other loudspeakers are judged. RACONS are used on U. S. Army Transport and Navy vessels — by other branches of the Military — in factories, schools, auditoria, shipyards, etc. RACONS are available for every conceivable application. Specify RACON when planning your next sound or public address installation

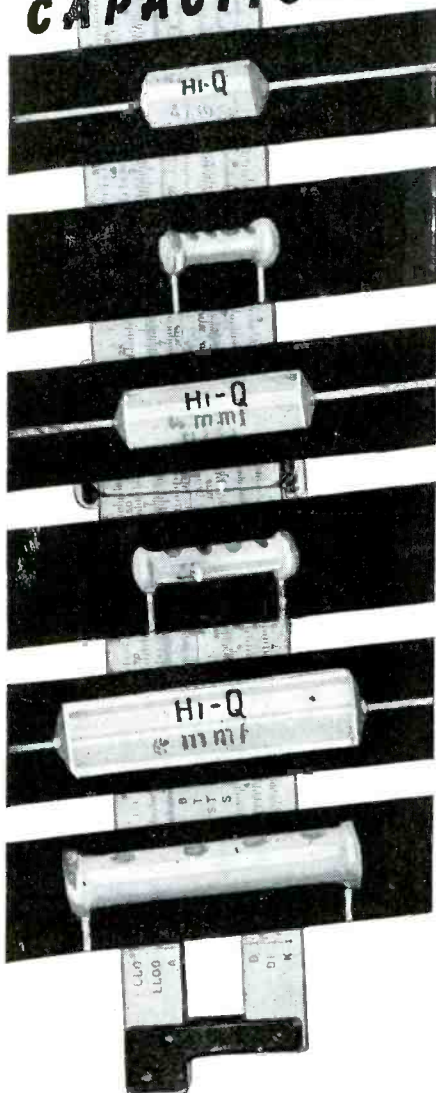
RACON ELECTRIC CO., INC., 52 East 19th St., New York, N. Y.



ENGINEERED TO THE APPLICATION

HI-Q

**CERAMIC
CAPACITORS**



**ELECTRICAL
REACTANCE
CORPORATION
FRANKLINVILLE, N. Y.**

Shop Notes

JACKSON-BELL MODEL 62

Satisfactory antenna coil repair for Jackson-Bell Model 62. After splicing a break in the antenna coil lead at the bottom of the coil form the results were weak reception. Definite increase in the signal strength resulted from a lead being soldered directly from the antenna post to the grid clip lead inside the coil form. This type of repair found satisfactory due to difficulty in separating the coil from the coil form without damage to the secondary winding leads.

EMERSON MIDGET RECEIVER TONE IMPROVED

Emerson type 352 midget receiver tone was found to be definitely improved after substituting a 70L6 for a 50L6 and a 35Z4 (with proper line voltage adjustment) and adding inverse feedback. The inverse feedback was attained by using a .001 condenser and a 15,000 ohm resistor from the L6 plate to a tap in a cathode resistor series connection of 900 ohms and 2500 ohms, the 2500 ohms to the ground side by-passed with .05 condenser, the other side of the 900 ohm resistor to the cathode of the 12SQ7. By also soldering two leads, one to the chassis and the other to the i.f. tap and running them out the back of the chassis, a good bass—hi. fi. tone adjustment is added to the receiver.

MAJESTIC MODEL 460-A REPAIRED

Majestic model 460-A was given emergency repair in the following manner. The second intermediate transformer plate winding was burned out. This was repaired in the shop by using a 10,000 ohm 2 watt carbon resistor to replace the winding. The resistor was connected from the B to the tube plate. Then a .001 condenser of high quality was connected from the plate of the i.f. tube to the detector diode connection of the second detector. Signal response after realigning the receiver and making other repairs was found to be satisfactory in a rural community.

Allen's Radio Repair Service, Missouri

PROCTOR TOASTER NO. 1454 (NON-AUTOMATIC SIGNAL TOASTER)

Elements for this toaster do not fit any other toaster of the Proctor line, specify catalogue number when ordering.

If lamp burns out, replace with Mazda radio pilot lamp, No. 41, 2.5 volts or lamps obtained from the factory.

6A7 SUBSTITUTION

A 6F7 may be used to replace a 6A7 without necessitating changes in the set sockets. Melt solder out of end of No. 3 pin of 6F7 and then gently rock pin off, being careful not to break the wire within the pin. When pin is off solder the exposed wire to the adjacent No. 4 pin.

Realign the set for maximum output.
Orin Thompson, Wisconsin

1LA6 SUBSTITUTION

To substitute for the 1LA6 take the old tube and remove the glass. Then take an old 8-prong 6SK metal tube, remove the base from it and cleans the prongs so that the octal pins will fit into the octal prongs. Then by mounting a bantam octal socket on top of the octal base a 1R5 tube works efficiently.

Ted's Radio Service, Brooklyn

CROSLEY #59 CHASSIS

No control of volume on AM: Replace the 30 Mfd. cathode by-pass on the 6SQ7.

Weak Reception: Replace the cathode biasing resistor on the 6V6's using 250-ohm 10-watt unit.

No FM: Capacitor on oscillator coil not making good contact. Solder with a very hot iron.

Weak on AM: Increased value in screen resistor to 6SA7 A-M Det-Osc tube.

Hum after about 1 hour of operation: 6AH7GT tube bad.

SILVERTONE BATTERY SET

Distortion usually due to bad bias cells.

ZENITH "RADIO" NURSE

Will not operate unless both units are plugged into the same socket or very close to each other: Replace the 84 tube in the transmitter unit even if it tests OK.

PHILCO 41-608

Bulb in phono head does not light or is very dim: Replace the 7Y4 tube.

ZENITH 6D413

(and models with bakelite chassis)

Weak, distorted: The wooden plug that makes the contact for the center arm of the volume control comes out. If it cannot be found usually another old control made by the same manufacturer can be found with this plug intact.

SILVERTONE 1725

No signals on the high frequency end of the broadcast band: Open .1 mfd by-pass on the 20000 ohm resistor, dropping the voltage for the oscillator plate of the 6A7.

FADA 262W

Distortion: Open RF choke between the antenna coil and the chassis.

PHILCO 38-9

No volume: 4-8 mfd electrolytic can condenser open.

Douglas Corbett, N. H.

Group Subscribers — Save Money!

Form A Group — Join A Group

Here's why EVERY Service Dealer will want his own copy of "RSD" from now on:



New Service Data

As new radios are released, the circuits and service data of popular models will be published in RSD. It's a feature every Service Dealer will welcome.

New Test Equipment

Articles describing new test equipment and new postwar servicing techniques are in preparation to help all Service Dealers do their work more efficiently, in less time, at greater profit.

New Merchandising Techniques

Avoid mistakes in merchandising and store management by following the tips given by successful Service Dealers. Watch future issues of RSD.

Look at the Record!

During the past two years RSD has published over 305 pages of exclusive technical data and nearly 200 pages of general, semi-technical character—more than any other trade paper carried on these subjects. RSD is a fine investment, so get aboard NOW.

Group Subscribers Save Up To \$1 Each

The bigger the Group the more each man saves! 2 men subscribing together, each saves \$.25—4 men Groups save \$.75 per man—6 men Groups save \$1.00 per man. Present subscribers may join a Group to extend their subscription.

Use This Coupon For Convenience

(The coupon below can be used for 1 to 6 subscription orders. Use it today!)

—TEAR OUT—MAIL TODAY—

RADIO SERVICE DEALER

342 Madison Ave., New York 17, N. Y.

Please enter 1 year subscription orders for the names given below. Our remittance is enclosed.

NOTE: If you do not wish to tear this order blank out, just print or type the information on a single sheet of paper, following the style given. Each subscriber's occupation must be clearly described.

	U. S. & Canada	Foreign
<input type="checkbox"/> One 1-year subscription	\$2.00	\$3.00
<input type="checkbox"/> Two 1-year subscriptions	\$3.50	\$5.50
<input type="checkbox"/> Three 1-year subscriptions	\$4.50	\$7.50
<input type="checkbox"/> Four 1-year subscriptions	\$5.00	\$9.00
<input type="checkbox"/> Five 1-year subscriptions	\$5.50	\$10.00

Groups of 6 or more U. S. and Canadian subscriptions will be accepted for \$1.00 each. Foreign at \$1.50 each.

Name

Address

Describe Title or Position and Type of Business

State whether a New Subscriber or Renewal Order

Name

Address

Describe Title or Position and Type of Business

State whether a New Subscriber or Renewal Order

Name

Address

Describe Title or Position and Type of Business

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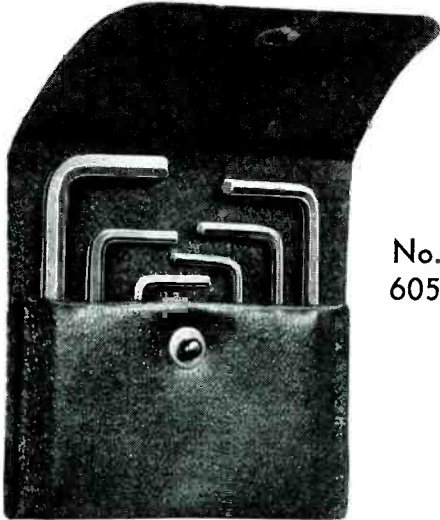
Name

Address

Describe Title or Position and Type of Business

State whether a New Subscriber or Renewal Order

ALLEN Key Kits



No.
605

VEST-PAC-KIT



No. 605 — Packet only 3" x 2³/₄" over-all contains 6 Hex Keys to fit hollow set screws in sizes No. 4, 5, 6, 8 and 10; also 1/4" and 5/16". Same keys fit socket head cap screws in sizes No. 4, 5, 6, 8 and 10. Most compact and serviceable little set you could ask for. List price, only 50¢.

Ask for complete listings of Allen Hollow Screw Assortments and Key Kits. Address inquiries and orders to Dep't. G,

**THE ALLEN MFG. CO.,
HARTFORD 1, CONN., U. S. A.**

In Trade [from page 50]

H. N. Lubet Is Fada Advertising Manager

Mr. Jack M. Marks, president of Fada Radio, announces the appointment of Herman N. Lubet as Advertising Manager. In announcing the appointment, Mr. Marks said, "We are entering upon a period in radio history that may well set the future manufacturing and selling pattern for many years ahead. That is the reason for Mr. Lubet joining our organization. His seasoned experience will aid us in our ambitious plans along these lines.

"We are planning our course in the knowledge that it must be a long range pattern, designed to bear fruit after the initial hysteria of radio buying has subsided. In two or more years hence, what will be the position of the radio manufacturer? What creed must the industry adopt in order to safeguard its proper position?

"The present 'seller's market' is merely temporary; long-time profits and stability rest upon creative and aggressive selling. In the long run the interests of dealer, distributor and manufacturer are identical. As manufacturers we recognize that our distributors and dealers must be selected with utmost care, giving preference to those with reliability, integrity and ability to render service. We must gauge production to prevent liquidation and price-cutting, protect dealers and jobbers on discontinued models or those on which price is to be lowered.

"We must protect jobber's territories by not setting up over-competition. We must keep our product prominently before the public and aggressively help dealers with their local promotion problems. We must cooperate actively and effectively with our distributors and dealers to the ends of more profits and better service to the public. We must infuse faith and stability in our product and all energy must be bent toward that end."

Parts Sales Manager for Sylvania

Mr. H. Ward Zimmer, vice president in charge of Radio Tube Division of Sylvania Electric Products Inc. announces the appointment of Bernard J. Erskine as Manager of Parts Sales, with headquarters in Emporium, Pennsylvania. Mr. Erskine has been with Sylvania since November 1934, except for the last three years which he has spent in the Navy. He held the rank

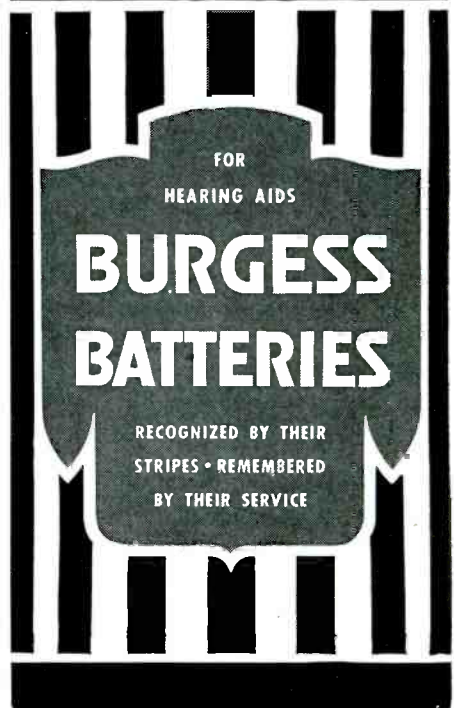
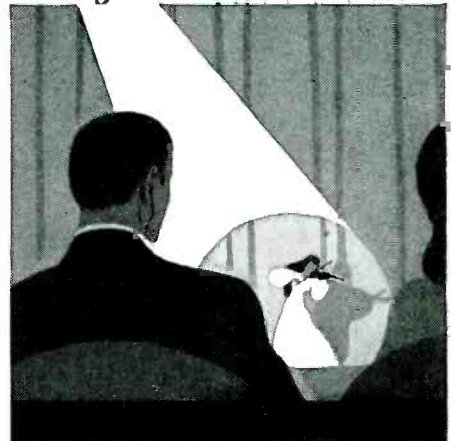
[see page 58]

BURGESS Black and White POWERHOUSE!

This Burgess ad stands right out and shouts "BURGESS BATTERIES" to your customers! They'll see it in *The Saturday Evening Post*, *American Magazine*, *Liberty* and 21 other best-read magazines!

says HOMER G. SNOOPSHAW

**BURGESS
BATTERY
COMPANY**
FREEPORT,
ILLINOIS





Let your HEAD take you

(The average American today has a choice of just going where "his feet take him", or choosing wisely the course to follow. Let's skip ahead 10 years, and take a look at John Jones—and listen to him . . .)

"SOMETIMES I feel so good it almost scares me.

"This house—I wouldn't swap a shingle off its roof for any other house on earth. This little valley, with the pond down in the hollow at the back, is the spot I like best in all the world.

"And they're mine. I own 'em. Nobody can take 'em away from me.

"I've got a little money coming in, regularly. Not much—but enough. And I tell you, when you

can go to bed every night with nothing on your mind except the fun you're going to have tomorrow—that's as near Heaven as man gets on this earth!

"It wasn't always so.

"Back in '46—that was right after the war and sometimes the going wasn't too easy—I needed cash. Taxes were tough, and then Ellen got sick. Like almost everybody else, I was buying Bonds through the Payroll Plan—and I figured on cashing some of them in. But sick as she was, it was Ellen who talked me out of it.

"'Don't do it, John!' she said. 'Please don't! For the first time in our lives, we're really saving money. It's wonderful to know that every single payday we have more money put aside! John, if

we can only keep up this saving, think what it can mean! Maybe someday you won't have to work. Maybe we can own a home. And oh, how good it would feel to know that we need never worry about money when we're old!

"Well, even after she got better, I stayed away from the weekly poker game—quit dropping a little cash at the hot spots now and then—gave up some of the things a man feels he has a right to. We didn't have as much fun for a while but we paid our taxes and the doctor and—we didn't touch the Bonds.

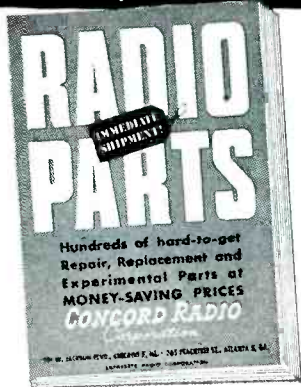
"What's more, we kept right on putting our extra cash into U. S. Savings Bonds. And the pay-off is making the world a pretty swell place today!"

The Treasury Department acknowledges with appreciation the publication of this advertisement by

★ **RADIO SERVICE DEALER** ★

**IMMEDIATE
SHIPMENT!**

*Radio Parts
Electronic
Equipment*



**Mail Coupon Below for New
CONCORD CATALOG—Sent FREE**

32 pages of money-saving bargains in hundreds of standard-line, top-quality radio and electronic parts. Note these typical CONCORD values—



Precision Resistor
12 Megohm
10 K. V.
Sprague
ferrule mtg.
type.

SB121 **\$495**

Time Delay Relay
15 Amp. contacts, timed at 60 sec. + or - 3 sec. for 115 v. 60 c. operation.



SB4097 **\$495**

**Order Today for Shipment Tomorrow
from CHICAGO or ATLANTA**

Huge stocks in TWO convenient warehouses—one in CHICAGO and one in ATLANTA—are ready NOW to make IMMEDIATE SHIPMENT of radio and electronic parts and equipment of dependable, nationally-known quality—and at Victory Clearance prices that mean important savings on Meters, Condensers, Transformers, Resistors, Controls, Switches, Relays, Test Equipment, Generators, Microphones, Tools, and hundreds of Repair, Replacement and Accessory Parts. Whatever your needs, see the surprising values offered in CONCORD'S NEW CATALOG. Mail the coupon for your FREE copy now.

CONCORD RADIO CORP.

Lafayette Radio Corporation

CHICAGO 7, ILL.
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265 Peachtree Street

CONCORD RADIO CORPORATION

901 W. Jackson Blvd., Dept. K-26
Chicago 7, Illinois

Please rush free copy of CONCORD'S
new 32-page CATALOG.

Name.....
Address.....
City..... State.....



In Trade

[from page 56]

of Chief Specialist with Naval Intelligence and served two years in the C.B.I. Theatre, most of which was in China.

Stewart-Warner Appoints

Leo B. Pambrun has joined the advertising department of Stewart-Warner Corporation as assistant advertising manager in charge of the radio division, it was announced today by Fred R. Cross, advertising manager. Mr. Pambrun was discharged from the U. S. Marine Corps last November, after serving in this country and in the Pacific Theater for over three and a half years.

Prior to his enlistment in the Marine Corps, Mr. Pambrun served for two years as assistant advertising manager of the Crosley Radio Corporation of Cincinnati. For two years previous to that he was assistant advertising manager of the Brunswick-Balke-Collender Company of Chicago. He is not a newcomer to Stewart-Warner, having been employed in the advertising department there eight years ago.

Scott Delivers First Models

Delivery of the first postwar Scott radios to franchised dealers throughout the United States were completed the middle of February, it was announced by E. J. Halter, vice president of the Scott Radio Laboratories, Inc., of Chicago. The model that will be available at this time is the Scott 800, selling in the neighborhood of nine hundred dollars.

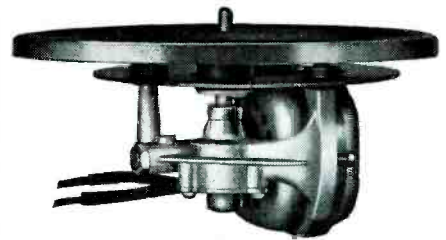
The Scott 800, like Scott's other models, incorporates a high fidelity radio-phonograph combination and the new Teague dial. With a total of 24 tubes of the latest type, it is designed to reproduce the entire frequency range transmitted, with particular emphasis given to the reception of FM broadcasts and fine quality recordings. The Teague dial, designed by Walter Dorwin Teague, leading New York industrial designer, provides the maximum in precision tuning and finger-tip adjustment through seven highly calibrated control knobs. This dial rests inside the cabinet when not in use and rolls out for tuner convenience.

Halter stated that OPA price listings on all of the Scott models will be announced shortly.

Aireon Vice President

R. C. Walker, president of Aireon Manufacturing Corporation, announces

Smooth Power
**BRINGS SMOOTH
PERFORMANCE**



YOU CAN safely trust General Industries Smooth Power motors to deliver completely satisfactory performance in your phonographs, recorders and record-changers. They're compact, lightweight yet sturdily built. Their uniform speed and quiet operation make them smooth as velvet. Our comprehensive line gives you a wide selection for your planning and future requirements. *For smooth performance, standardize on Smooth Power motors.*



The General Industries Company
DEPT. M • ELYRIA, OHIO

the election of Arthur E. Welch as vice president in charge of sales. Welch formerly was vice president and treasurer. He brings to this new key position a keen understanding of Aireon's numerous activities, its policies, post-war plans, and its sales activities.

Announce New Electronics "Wonder"

Two prominent electronics engineers have just invented and produced a "revolutionary" radio receiver that, besides providing radio entertainment, also carries your voice over electric light wires from point to point without special interconnecting wires. By simply plugging it into the nearest electric light socket, you can talk instantly to another person who has a similar instrument in another room or office, or on another floor — even in the basement or garage. There are no wires to install.

Mr. Levy is the originator and patentee of this new means of plug-in intercommunication over the power lines which requires no additional wiring installation. He has patents issued in the United States, Canada and seventeen foreign countries.

These instruments operate on the principle of carrier-currents, superimposed on the electric light wires. Each instrument, when talked into, becomes a small radio frequency transmitting station which delivers "wired radio" to the electric light circuits. The voice can be picked up, amplified, and reproduced through a loudspeaker without distortion or loss of distinction. So sensitive are these instruments that a person talking in a natural conversational tone of voice at five or ten feet distance, can readily be heard.

"Electronx" is fully automatic in action. The regular radio broadcast stations are received with excellent quality. The radio cuts-out automatically when the radio unit is called by any other unit. At all times communication can be effected, even though the radio receiver is turned off. The practical uses for this new means of radio reception and entertainment and wireless communication are numerous. It should be a boon for the home, office, factory, estates, farms, ranches, hotels, restaurants, schools, colleges, hospitals and many other applications.

This product is to be sold in stores as package merchandise under the trade name of "Electronx"; so named by its creators, Sol J. Levy and J. Lawrence Cassell, president and vice president of Monmouth Laboratories, where it was developed, and likewise of Lectradio Corporation of Newark,

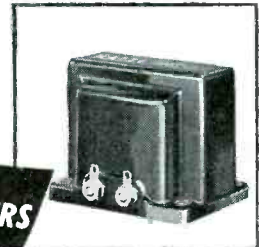
[see page 61]



• THE HALLDORSON COMPANY has continuously manufactured for industry since 1913. Since inception, this firm has been and is still an individual firm . . . not a subsidiary or branch of another company. Each and every HALLDORSON transformer is backed by 33 years of experience, research and actual field knowledge. A new and more complete line of transformers is now being developed in the HALLDORSON laboratories. Soon . . . we hope, in the very near future . . . these transformers will be available.

JOBBERs: Get on our mailing list today!

THE HALLDORSON COMPANY
SINCE 1913
4500 Ravenswood Avenue • Chicago 40, Illinois



HALLDORSON Vacuum Sealed TRANSFORMERS

Genuine **DRAKE 100-Watt SOLDERING IRON**

A GREAT Olson BUY!
Perfect for general radio work. The element is wound with highest quality Nichrome on amber mica. Finished in fine gun-metal. Has 6-ft. cord and 3/8" plug-in tip. Underwriters Laboratories Approved.

\$2.49 PLUS 15c POSTAGE

OLSON 10¢ SPECIAL

6-Inch STEEL RULE and Depth Gauge

SPECIAL STAND INCLUDED FREE with each Iron!

This offer good only in U. S. A.

Handy, accurate Tempered Steel pocket rule. Quick-reading 64th graduations. Pocket clip. A big dime's worth! (Send for our free catalog.)

MAIL TODAY **OLSON RADIO WAREHOUSE**
73 E. Mill St., Dept. 13, Akron, Ohio

Send me — 100-watt Drake Soldering Iron(s) @ \$2.49 plus 15c postage.
Send me — Steel Rule and Depth Gauge(s) @ 10c. I enclose _____

NAME
ADDRESS

FARM RADIO MARKET to Double

RURAL electrification may bring radio to 3,150,000 more farm families in the next five years and, by 1950, there may be nearly 5,500,000 new radios on America's farms—even on a one-set-per-family basis. This prediction is made by the Radio Manufacturers Association despite the fact that there are more radios on the nation's electrified farms than any other electric appliance or item of electric farm equipment.

It is based on sales estimates by manufacturers in connection with an analysis of the program of the Rural Electrification Administration which has as its goal the electrification, through central station service, of every farm home in the country. Completion of the program would electrify more than 3,500,000 additional farms, bringing the total to nearly 6,100,000 based on the number of farms counted in the 1940 census, of which some 2,600,000 have been electrified to date.

Latest available figures show that 90 per cent of electrified farms are equipped with radios for a total of 2,340,000 sets—the percentage, as well

as the total, showing that radios are the most widely purchased of all electric household electric appliances and equipment used on farms. If the same percentage is maintained, the 1950 total will approach the 5,500,000 mark estimated by the association.

Of the 2,340,000 radios now in use on electrified farms, a large percentage now are in need of replacement, the RMA reports disclose. By 1950, all of them probably will have been replaced, and these added to the 3,150,000 new sets purchased for present non-electrified farms account for the forecast that all of the 5,500,000 radios will be new models.

Some members of the Radio Manufacturers Association believe that the totals are conservative since they do not take into consideration the fact that a million or more dwellings classified in the 1940 census as "rural non-farm" will become electrified if the Rural Electrification Administration's program is carried out. This would mean nearly that many more new ra-

RADIO SET PRODUCTION

A strong optimism on 1946 radio production was voiced by Joseph Gerl, president of Sonora Radio & Television Corp., at two luncheons for radio dealers in Portland, Ore., and Seattle, Wash., this month.

"The slow start in producing civilian radios," said Gerl, "has led some dealers to feel pessimistic about radio production in general. I cannot tell you too strongly that the delay in reconversion was merely a temporary matter, that the wrangling by parts manufacturers and the OPA is likewise a temporary matter, and that radio production in 1946 will undoubtedly exceed any year's production in the history of the industry."

"Before the war there were slightly more than 50,000,000 sets in use throughout the nation. Of that total number, about 20,000,000 are defective or obsolete today, and another 5,000,000 sets are required to replace the depleted stocks of dealers and distributors. Even at peak production it will take at least three years for the radio industry to catch up with the need for replacements and new current demand."

SPEED UP REPAIRS WITH THESE G-C AIDS!

Handle Dial Belt Replacements the Easy G-C Way!



1. To determine proper belt for any radio, G-C supplies a complete Belt Replacement Guide and Measuring Scale.

2. By using G-C Belt Guide, just check model number of the set to determine correct G-C Belt.

3. If you don't know model number or make of the set, use G-C Measuring Scale and simple instructions to measure belt.

4. Order belt by number from your radio parts distributor. Phone or mail your order to receive prompt service — no waiting.

5. Better still — have a complete G-C Belt Kit on hand. Belts are indexed in permanent steel box with slide-in drawer.

FREE TO ALL RADIO SERVICEMEN — 68 page G-C No. 345 Belt Guide and Service Book and Measuring Scale. Ask for them at your Radio Parts Distributor.

Get "Smooth-Strong-Correct Fit" G-C Dial Belts from Your Radio Parts Distributor

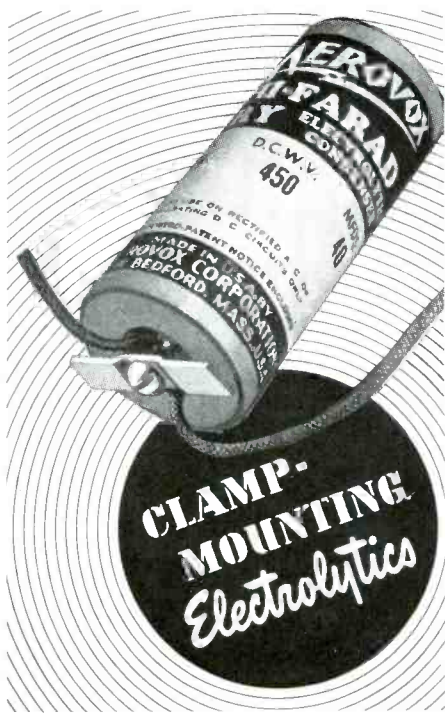


GENERAL CEMENT MFG. CO.
ROCKFORD, ILLINOIS

SELL MORE APPLIANCES TO FARMERS

National Electrical Manufacturers Association forecasts, according to W. J. Donald, managing director, that the 1946 output of household appliances may exceed by as much as 50 per cent that of 1940. Dealers covering rural areas should expect a lot more appliance business from farmers. Great plans are afoot for promoting farm electrification. And where the high-line service goes up and down country roadways and lanes, there should the dealer's salesman tread quickly on the trail of new radio and appliance business. For the next five years the total expected volume of appliance sales alone to farmers will be in the neighborhood of \$2,500,000,000.

[see page 61]



● Here's the ideal universal one-hole mounting electrolytic replacement. Takes the place of the twist-prong, spade-lug, screw-base, and other similar types. This Type PRV—an exclusive Aerovox design—is easily and rigidly mounted by means of its center screw. High-purity aluminum sections. Thoroughly sealed. Available in popular ratings to meet widest range of servicing. ● Ask our jobber for this handy universal electrolytic. Ask for latest Aerovox catalog. Or write us.



FOR RADIO-ELECTRONIC AND INDUSTRIAL APPLICATIONS

AEROVOX CORP., NEW BEDFORD, MASS., U.S.A.
 Export: 13 E. 40th St., New York 16, N.Y. • Cable: 'ARLAB'
 In Canada: AEROVOX CANADA LTD., Hamilton, Ont.

McElroy
 World's Largest Manufacturer of Wireless Telegraphic Apparatus
 COMPLETE CENTRAL OFFICE EQUIPMENT
McElroy Manufacturing Corp.
 62 Brookline Avenue • Boston, Massachusetts

PREVORE Est. 1930
 Now Shipping

CHROME Electric Broilers
 Inquire Now!
 Broiler Pioneers
 PREVORE ELEC. MFG CO
 126 - 18 St., Bklyn, N.Y.

dios, in addition to the 5,500,000 figure. Using the administration's 1943 figures, farm purchases of radios in the five-year period would total nearly a quarter of a billion dollars.

In Trade
 [from page 59]

New Jersey, where it is being manufactured.

Repair Shop Charges

Small repair shops for appliances, motor vehicles and farm equipment cannot automatically increase their ceiling prices on account of wage increases granted their employes. This action, effective February 9, 1946, synchronizes OPA price ceiling provisions for these shops with the Government's wage-price policy established in August 1945.

Since 1943 and until last August shops, with not more than eight employes, have had authority to increase their ceiling prices to compensate for wage increases to employes. A report of such action merely had to be filed with the local price board.

Since August 1945 wage increases could not be considered as a basis for increasing price ceilings for these repair shops. The present action merely brings the price ceiling provisions in line with this change. (Amendment 3 to Supplementary Service Regulation 6 to Maximum Price Regulation 165 and Amendment 3 to Supplementary Service Regulation 22 to Maximum Price Regulation 165—both effective February 9, 1946.)

Crosley Delivers

Norman C. Macdonald, General Manager for the Crosley Distributing Corporation in New York, announced today that enfranchised dealers in this area had been supplied with the De-Luxe Crosley Shelvador Model SE746. The appearance of the Shelvador on the market was delayed pending OPA price approval which has been set at \$199.95.

Advertising Booklets

"Thirty Second Radio Announcements" and "Newspaper Ad Mats", two new field booklets, recently published by Sylvania Electric Products Inc. will be of interest to dealers concerned with enlivening their local advertising on the company's lighting products.

The booklet on radio announce-
 [see page 62]

LAKE'S

RADIO CABINETS & PARTS

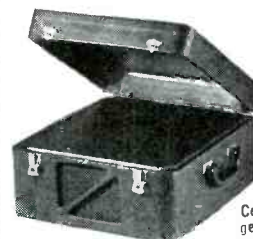
Now Available!



Postwar
 2 Post
RECORD-CHANGER

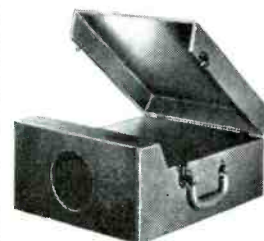
In luxurious brown leatherette portable case, 15" L x 15" W x 10" D. Latest electronic developments make this modern record-changer the finest on the market today!

List Price—\$49.95 Dealer's Net—\$29.97



De Luxe PHONO CABINET

Covered in luxurious, genuine brown leatherette, has deluxe brass hardware throughout, made completely of plywood with brown plastic handle, has padded top and bottom. Motor board 14" x 14 1/2". Overall dimensions 16" L x 15" W x 8" H. Your special net price\$8.95



Portable Phonograph case in brown leatherette covering. Inside dimensions 17 1/2" long, 13" wide, 7 1/2" high. Has blank motor board and opening for speaker. As illustrated at left, specially priced at ..

\$7.95

Also blank table cabinets of walnut veneer in the following sizes, with speaker opening on left front side:

(Note: *7 has center speaker grill.)

#1	8 1/4"	L x 5 1/2"	H x 4"	D \$1.95
#2	10 1/4"	L x 6 3/8"	H x 5"	D \$2.75
#3	13 1/2"	L x 7 5/8"	H x 6 1/4"	D \$3.25
#7*	10 3/4"	L x 7"	H x 5 1/2"	D \$2.50

*Speaker Opening in center of front side.
 All types of radio cabinets and parts are available at Lake's Lower prices. A large stock is listed in our catalog.



SERVICEMEN—RETAILERS
 Join our customer list today.

Dept. E

Write for our NEW 12 page, illustrated, elaborate catalog!
Order from Lake!
 You'll make no mistake!

Lake Radio Sales Co.
 615 W. Randolph Street
 Chicago 6, Ill.

TEST EQUIPMENT

A Limited Quantity
For Immediate Delivery

WESTON

No. 772 Set ANALYZER \$68.35

No. 697 VOLT-OHM-MILLIAMETER \$29.03

No. 663 VOLT-OHM-MILLIAMETER \$49.14

RCP

No. 488 MULTI-TESTER \$70.07

TRIPLETT

No. 2405 VOLT-OHM-MILLIAMETER \$44.10

Write for Free 1946 Parts Catalog



731 West Washington Blvd. — Dep't. S
Chicago 6, Illinois

Write for BIG, NEW CATALOG

... describing the
comprehensive line of

MARION

... Standard and
Hermetically Sealed
Electrical
Indicating
Instruments



... with an "extra" section containing a valuable guide to instrument ordering of prime importance to all who sell and use electrical indicating instruments.

MARION ELECTRICAL INSTRUMENT CO.

MANCHESTER, NEW HAMPSHIRE

Jobber Sales Division: Electrical Instrument Distributing Co.
450 BROADWAY NEW YORK, N. Y.

In Trade

[from page 61]

ments contains various pre-tested spot commercials of national product promotion which have a local flavor, while the newspaper ad mat book presents advertising aids available to the dealer. Copies of both these booklets may be had on request to Sylvania Electric Products Inc., 60 Boston Street, Salem, Massachusetts.



E. A. Rood, Jr., is appointed advertising manager of Camfield Mfg. Co., Grand Haven, Mich. Products include automatic toaster and Fluor-O-Shield for open type fluorescent light fixtures.

New "Plasmatomic" Records

The Plasmatomic Record Company of New Jersey, new record manufacturing firm, is offering unbreakable plastic records on the market in the popular music field at standard prices. Distribution is scheduled for the early part of 1946. Made of a new plastic material for which this company has the exclusive formula, the new record does not break, crack, scratch, chip or warp, and is durable.

The new record will retail at popular prices and will be made in the standard seven, ten and twelve inch sizes. In addition to entering the popular as well as the classical record field, the Plasmatomic Record Company will make the new plastic disc available for the home recording industry.

For further information or demonstration, communicate with Lou Lawrence Associates, 2 Columbus Circle, Telephone CI 7-5973, New York, N. Y.

Garod Prices

Garod Radio Corporation has received from the Office of Price Administration approval on a retail price range for eight of its post war models, according to Max Weintraub, president. The dealer re-sale ceiling price, including excise tax, in Zone 1 ranges



Get your
copy
NOW!

★ It's just off the press — the Clarostat No. 46 Catalog — listing the post-war Clarostat line of resistors, controls and resistance devices — the greatest choice of types yet offered. ★ Ask your Clarostat jobber for this new Clarostat No. 46 Catalog. Or write us direct.



CLAROSTAT MFG. CO., Inc. • 285-7 N. 6th St., Brooklyn, N. Y.

ADDRESS CHANGES—

Subscribers to RSD should notify our Circulation Dept. at least 3 weeks in advance regarding any change in address. The Post Office Dept. does not forward magazines sent to a wrong address unless you pay additional postage. We cannot duplicate copies of RSD sent to your old address.

RSD Circulation Dept.

Cowan Publishing Co.

342 Madison Ave., New York 17, N. Y.

From original to reproduced/sound



Newcomb presents an answer to the growing demand for truly fine amplification equipment... built in accordance with the most advanced engineering knowledge. Newcomb engineers have specialized exclusively for more than seven years in producing the finest quality amplifiers... offering simple installation, easy operation, long life and true reproduction. The final answer in sound, however, is what you hear... and what you hear with a Newcomb is good! From original to reproduced sound... the line between is mighty thin!

Write for details of complete line

THE SOUND OF QUALITY

Newcomb
AUDIO PRODUCTS CO.
 MANUFACTURERS
 DEPT. D. 2815 S. HILL STREET
 LOS ANGELES 7, CALIFORNIA

DEALERS YOU CAN MAKE
 A DOUBLE PROFIT THROUGH
 HANDLING BOOKS

- 1. BOOKS BRING YOU BETTER CUSTOMERS**
 They stimulate the interest and knowledge that make steady buyers. The more your customers know about radio the more they will buy from you.
- 2. BOOKS ARE A PROFITABLE STOCK ITEM**
 Our trade discounts allow you a good profit on each sale. Our wide promotion insures their sale without effort on your part.

LET THESE 3 NEW BOOKS INCREASE YOUR BUSINESS



We can supply copy and cuts for your catalog and circulars with your imprint. Write us today for full information on our new radio books, our dealers' discounts and free promotional aids.

The Macmillan Co., 60 Fifth Ave., New York 11
 Tech. Bk. Dept.

from \$24.50 to \$38.25 and in Zone 2 from \$25.75 to \$40.15.

Of the prices approved, seven cover plastic table radios, plus one portable phonograph. Samples of the complete line (over 40 models, including console combinations, portables and farm receivers) are now on nationwide tour before dealer meetings in key cities. Distribution, advertising, and merchandising policies are being revealed to the trade at these dealer conferences by Lou Silver, sales manager.

1942 Prices on Vacuum Cleaners

Household vacuum cleaners and attachments will return to dealers at March 1942 prices. In an action effective December 21, 1945, OPA has set dollar-and-cent consumer ceilings, based on October 1941 catalog prices, for all well known brands. These prices will be printed on tags to be affixed by the manufacturer.

In the same action, manufacturers were granted a 6 per cent increase over their October 1-15, 1941, prices to distributors, to comparatively permanent cost increases that have taken place during the war. *Distributors and dealers will share in absorbing the increase*, according to a formula set up in regulation.

In case any manufacturer did not sell a particular model during the first two weeks of October 1941, but did sell the model between then and the following March 31, the price during that period will constitute the base on which he may apply the 6 per cent re-conversion increase.

Manufacturers who produce models for chain or specialty store private brand name sellers will calculate retail prices and preticket units according to the same formula applicable to manufacturers selling under their own brand names. (Revised Maximum Price Regulation No. 111 — effective December 21, 1945.)



Jerome Lee Herold is appointed in charge of sales and distribution for Burkaw Electric Co., 195 E. 29th St., New York. Products: steam irons, heaters, phono amplifiers and recorders.

HERE'S A NEW AND VITAL BUSINESS!

LEARN ELECTRICAL APPLIANCE REPAIRING

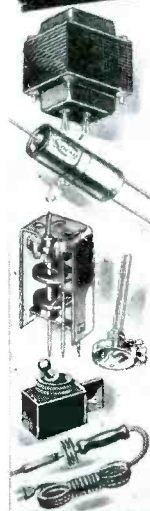
Offers Big Money — Independence

If you are mechanically inclined—can hold and use tools it will pay you to learn electrical appliance repairing. Operate from your garage, basement, etc. Work as many hours as you wish—the appliance repairman is his own boss. On many types of repairs it is usual for a repairman to charge on the basis of \$5.00 to \$6.00 an hour!

No Previous Experience Needed

Profusely illustrated our new course shows you in simple, easy to understand language plus drawings and photographs, how to make each repair on refrigerators, vacuum cleaners, washing machines, motors, fans, irons, etc., etc. Explains and gives you a working knowledge of electricity, welding, nickel plating, etc. Shows you how to build the power tools you need and how to solicit and keep business coming to you. Not a theory course but an honest to goodness practical course written by and used by repairmen the country over. Price of course is so low that the savings on your own household appliances will pay for it. Act now! Send today for FREE literature. CHRISTY SUPPLY CO., 2835 N. CENTRAL AVE., DEPT. D-131, CHICAGO 34, ILLINOIS.

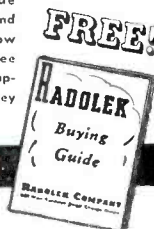
RADOLEK
Radio-Electronic Service Parts



Large stocks assure the finest and most complete selections of all available items at lowest prevailing prices. Thousands of active buyers depend on us for their entire Radio repair and replacement requirements. Because we understand service problems, every order is expedited for delivery in double quick time. Everything we do is planned for convenience and satisfaction to our customers. You will find it profitable to make Radolek your buying headquarters.

FREE BUYING GUIDES

Because of existing conditions we keep our customers right up to the minute on available merchandise by releasing supplements frequently instead of sending our regular Big Profit Guide once a year. Send the coupon now to get these Free Buying Guide Supplements as they are issued.



FAST SERVICE!

RADOLEK CO., Dept. R-110
 601 W. Randolph St., Chicago 6, Ill.

Please send FREE Buying Guide Supplements

NAME _____
 ADDRESS _____

ORDER FROM RADOLEK

For Best Performance



NEW POSITIVE BALANCED TENSION CONTROL IN TELESCOPING

Chrome plated! Rust-proof! Rattle-proof!



Our expanded engineering and creating departments are now at work on some of the outstanding products of tomorrow. Foremost is our line of **AUTO ANTENNAE!**

WRITE TODAY FOR FULL DETAILS ON OUR LINE!



FREE

TO RADIO MEN



COLOR CODE and OHMS LAW CALCULATOR

Burstein-Applebee of Kansas City offers you this great convenience **FREE**. Easy to work. Solves many problems in a jiffy. **FREE** to radio men, electronic engineers and others in the business. Attach coupon to your letterhead.

MAIL COUPON NOW

BA

BURSTEIN-APPLEBEE CO.
1012 MCGEE, KANSAS CITY 6, MO.
Send me **FREE** Color Code and Ohms Law Calculator along with latest catalog.

I am _____
STATE CONNECTION IN INDUSTRY

NAME _____

ADDRESS _____

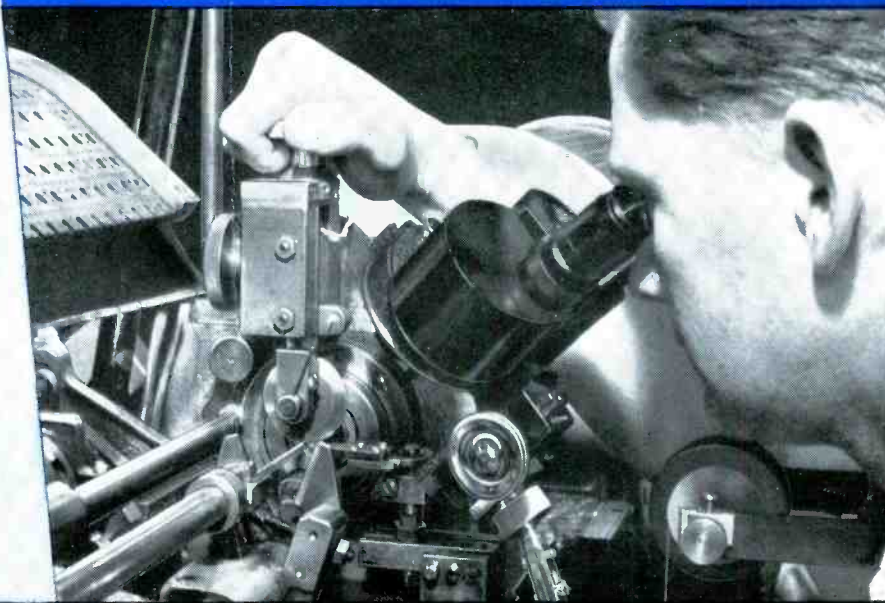
TOWN _____ STATE _____

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MAKING TUBES IS EASY If YOU KNOW HOW!

● On this automatic grid winding lathe, the two heavy side-post wires — drawn from two large spools — are pulled taut over a mandrel form. A cutting wheel nicks these support wires, as the mandrel, wires, and spools revolve on the lathe. Very fine lateral wire is simultaneously wound from another spool into these nicks, with the mandrel providing the proper cross-sectional shape. A swedging wheel presses the side-post rods, thus anchoring each lateral turn firmly into place. Finished grid strips approximately twelve inches long are then cut to the required lengths. Excess turns are removed from each end of these short lengths preparatory to assembly. The completed grid is finally micro-gaged and micro-inspected.



HERE'S AN EXAMPLE OF HYTRON KNOW-HOW..



NOTE THE SMALL DIMENSIONS OF THESE GRIDS

Tube	Grid	Turns Per Inch	Length of Winding	Width of Winding
HY69	Screen	30	1.417 in.	0.570 in.
12BE6	Control	76	0.776 in.	0.135 in.
6AK5	Control	200	0.322 in.	0.100 in.

12BE6 and 6AK5 grids cannot successfully be illustrated because of their minute size.

MASS production and a watchmaker's precision usually are strangers — especially if unit cost is low. Here you see a job setter adjusting a precision lathe on which tiny grids are wound to tolerances as tight as .0005 inch. Keen eyesight, patient perseverance, and the skill of a fine toolmaker, are his requisites. Pitch, turns per grid, inside and outside diameters, cross-sectional shape must be right on the nose. Furthermore, they must be kept there despite engineering changes in specifications, variances in materials, and wear and tear of the machine.

With this lathe turning up to 1000 rpm, grids form faster than the eye can travel. It is amazing to watch the tiny parts take shape — to examine with a microscope the rugged manner in which each lateral turn is swedged into the side-post rods.

Yet as you see these grids produced at top speed, it all looks easy. Nothing to it — *if you know how*. Then you stop to think. You realize skilled hands and precision machines are part of the Hytron know-how which makes tough jobs easy — which gives you tubes of dependable, jewel-like precision at prices absurdly low.

OLDEST MANUFACTURER SPECIALIZING IN RADIO RECEIVING TUBES



HYTRON

RADIO AND ELECTRONICS CORP.

MAIN OFFICE: SALEM, MASSACHUSETTS



For Peak Performance



Depend on
RAYTHEON BONDED
ELECTRONIC TECHNICIANS

Bonded by



A "STAR SALESMAN" FOR YOU!

Every customer who comes to your counter will see this effective wall banner. It tells them you're a dependable, square-dealing Raytheon Bonded Electronic Technician — and brings them back to spend money with you.

This selling wall banner is only one of many carefully designed sales-aids — displays, decals, mailing pieces, job record cards — for you to use in building a lasting, money-making radio service business. Bonded service means better customer relations. See your Raytheon distributor today.

Another reason why it pays to qualify as a Raytheon Bonded Electronic Technician.



RAYTHEON
MANUFACTURING COMPANY

Excellence in Electronics

RADIO RECEIVING TUBE DIVISION

NEWTON, MASS. • NEW YORK • CHICAGO