

In This Issue:

MODERN TUBE TESTING  
SERVICE MERCHANDISING

NEW SETS

VIDEO AMPLIFICATIONS

# radio service dealer



OCTOBER  
1946

# OPEN YOUR DOOR to New Business...

## 1,000,000 Portable Radio Owners Need Your Service

YOU want more business . . . fast-turnover, *profitable* business.

YOUR customers want "Eveready" "Mini-Max" radio batteries. Because there are 1,000,000 portable radios *out of service now*, needing minor repairs and BATTERIES! And there are 3,000,000 to 4,000,000 sets *in use*, with batteries wearing out every day.

So here's the key to the door: Display "Eveready" radio batteries in your window . . . on your counters . . . the 24-hour-a-day Silent Salesmen who suggest: "NOW you can get the batteries you've wanted!"

There's REAL MONEY WAITING. Open the way with a real display of "Eveready" radio batteries!



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

**NATIONAL CARBON COMPANY, INC.**

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

*Unit of Union Carbide and Carbon Corporation*



**DISPLAY THEM . . . CUSTOMERS DO THE REST**

*This advertisement appears in Radio & Television Retailing, October; Radio Service Dealer, October; Electrical Wholesaling, October, 1946*

# 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 10

October, 1946

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made by engineers  
for engineers.....

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Grand Rapids—Wholesale Radio Co.  
Jackson—Fulton Radio Supply  
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**SPRAGUE PRODUCTS COMPANY • NORTH ADAMS, MASS.**



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Write for Catalog C-306

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Radio Equipment Co.  
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Red Bank—J. H. Kelly Company  
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Radio Equipment Corp.  
Standard Electronics Co.  
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Fredonia—C. R. Barker  
Glens Falls—Ray Distributing Co.  
Hempstead, L. I.—Standard Parts Corp.  
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Jamaica, L. I.—Norman Radio Distrs.  
Middletown—L & S Radio Sales  
New York City—Fischer Distributing Co.  
Radionic Equipment Co.  
Radio Wire Tel., Inc.  
Niagara Falls—Niagara Radio & Parts Co.  
Rochester—Beaucaire, Inc.  
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Schenectady—Fort Orange Radio Dstg. Co.  
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Charlotte—Dixie Radio Supply Co.  
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Fayetteville—Eastern Radio Supply  
Goldstboro—Signal Radio Supply  
Greensboro—Dixie Radio Supply Co.  
Raleigh—Carolina Radio Equip. Co.  
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Canton—Armstrong Radio Supply  
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Cincinnati—Chambers Radio Supply Co.  
Schuster Elec. Co.  
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Cleveland—Goldhamer, Inc.  
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Winteradio, Inc.  
Columbus—Hughes-Peters, Inc.  
Whitehead Radio Co.  
Dayton—Hughes-Peters, Inc.  
Standard Radio & Electronic Prod. Co.  
East Liverpool—Hausfeld Radio  
Kent—Kladag Radio Labs.  
Lima—The Northwestern Radio Co.  
Mansfield—Burroughs Radio  
Marion—Bell Radio Supply  
Springfield—Standard Radio & Electronic  
Prod. Co.  
Steubenville—D & R Radio Supply  
Hausfeld Radio  
Toledo—Toledo Radio Specialties  
Warren—Radio Specialties  
Youngstown—Appliance Wholesalers

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Oklahoma City—Radio Supply, Inc.  
Southern Sales Co.  
Tulsa—Radio, Inc.

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Portland Radio Supply Co.

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Allentown—Radio Elec. Serv. Co.  
Beaver Falls—Reliable Motor Parts Co.  
Easton—Radio Elec. Serv. Co.  
Erie—John V. Duncombe Co.  
Harrisburg—Radio Distributing Co.  
Lancaster—Eshelman Supply Co.  
George D. Barbey Co.  
Norristown—Kratz Bros. Co.  
Philadelphia—Almo Radio Company  
Consolidated Radio Corp.  
Electric Warehouse  
Emerson Radio of Pa.  
Radio Elec. Serv. Co.  
N. W. Cor. 7th & Arch Sts.  
5133 Market St.  
3145 N. Broad St.  
Eugene G. Wile  
Pittsburgh—Hamburg Bros.  
The John Marshall Co.  
Radio Parts Co.  
Pottsville—Jones Radio Co.  
Reading—George D. Barbey Co.  
St. Marys—B & R Electric Co.  
Scranton—Broome Dstg. Co., Inc.  
Wilkes-Barre—General Radio & Elec. Co.  
Radio Service Co.  
Williamsport—Williamsport Radio Supply

### RHODE ISLAND

Providence—William Dandreta & Co.  
W. H. Edwards Co.

### SOUTH CAROLINA

Columbia—Dixie Radio Supply Co.

### SOUTH DAKOTA

Aberdeen—Danielson & Brost Co.  
Sioux Falls—Power City Radio Co.  
United Radio Supply

### TENNESSEE

Knoxville—Bomar's  
Chemcity Radio & Elec. Co.  
C. M. McClung & Co.

Memphis—McTyier Radio Supply  
Nashville—Currey's Radio Service  
Radio & Appliance Corp.

### TEXAS

Abilene—R & R Supply Co., Inc.  
Amarillo—R & R Supply Co., Inc.  
Austin—The Hargis Company  
Beaumont—Montague Radio Co.  
Corpus Christi—Wicks-DeVilbiss Co.  
Electric Equip. & Engin. Co.  
Dallas—All-State Dstg. Co.  
Crabtree's Wholesale Radio  
Southwest Radio Supply  
Wanslow & Co.  
Fort Worth—Electronic Equipment Co.  
Fort Worth Radio Supply Co.  
Houston—A. R. Beyer Company  
Lubbock—R & R Supply Co., Inc.  
San Antonio—Olsen Radio Supply  
Tyler—Lavender Radio Supply Co.  
Waco—The Hargis Company  
Wichita Falls—Wichita Falls Bat. & Elec.

### VIRGINIA

Norfolk—Ashman Distr. Company  
Roanoke—Leonard Elec. Sup. Co.  
Richmond—Johnson Gasser Co.

### WASHINGTON

Bellingham—Waickus Supply Co.  
Seattle—General Radio, Inc.  
Harper-Meggee, Inc.  
Sunset Electric Co.  
Spokane—Harper-Meggee, Inc.  
Tacoma—Wible Radio Supply

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Charleston—Chemcity Radio & Elec. Co.  
Hicks Radio Supply  
Clarksburg—Trenton Radio Co.  
Huntington—Electronic Supply, Inc.  
Morgantown—Trenton Radio Co.  
Parkersburg—Randle & Hornbrook  
Wheeling—Wheeling Radio Supply

### WISCONSIN

Green Bay—Neslo Electronic Distrs.  
Madison—Radio Distrs. of Madison, Wis.  
Milwaukee—Radio Parts Co., Inc.

# with the publisher...

## Some Blunt, Trite Observations

SINCE April 1942 I have written every Radio Service Dealer editorial. In each I have tried to be informative, to analyze Service Dealers' problems and help solve them. More important, I've tried to report factually *all* the industry's "behind the scenes doings", particularly when they were detrimental to you or your best interests. Off the record I call Service Dealers "my boys". I feel that I'm one of you; that I prosper when you do, and that I take a licking when you hit the bumps. This may be the first time I have used the personal pronoun "I" when writing this column, but it won't be the last—and for good reason.

I intend to keep on fighting for what I believe are *our rights*, meaning *us* Service Dealers' rights, just as I did when OPA tried to keep us from getting supplemental "B" rations of gasoline; just as I did when I opposed all Jobbers who did service work in competition with you: when certain cities tried to enforce licensing laws; when a certain political group tried to make technicians in its community join a trade union which that group of technicians opposed knowing that it was corrupt. I *don't* intend to preach to you fellows telling you to "Be Alert! Handle certain lines. Go after this or that kind of customer, etc., ad infinitum." Hell, if you men, being right there on the spot, don't know enough to be aggressive and progressive businessmen;—if you don't know how to sell and what you *can* sell your customers;—if you don't know enough to work hard (unless you are rich and can afford to loaf) and if you don't know enough to be honest, nothing that I could say in this column would mean a thing. You'd go bust in time because of your own short-comings. What I want to do, what I've set for my goal as an editorial writer is simply this: try to help us all help ourselves so that we can become solidly entrenched businessmen who, as time passes, will make more money and have to work less hard in so doing.

## The Flood Of Newcomers

MANY thousands of ex-GI's who were radio servicemen or Service Dealers before induction have come back into the field. As far as we can learn these returning oldtimers are making good in every sense of the word. They've mellowed with age and improved themselves in technical knowledge about radio. At the same time an alarming number of ex-GI's who prior to induction were not in the radio business are now flocking into it either as dealers (which means they need have but little technical ability) or as

servicemen because they did get a smattering of technical training while in the armed forces.

An old adage, "A little knowledge can be dangerous" is proving painfully true in cases where returning vets not having sufficient technical training have set themselves up as qualified radio servicemen and then falling down on the job have won the wrath of set owners who condemn the entire servicing profession indiscriminately. Radio servicing at present is a relatively simple business compared to what it will be in the near future when radios having truly complex circuits get large distribution. A little knowledge about V.H.F. and U.H.F. is not enough. A LOT of knowledge is required, and fast. Any refresher course taken now, any extra time put in now on subjects allied to how and when and what to do with radio test equipment will pay handsome dividends. Business now is grand of course, but let's not get too complacent. Let's plan now for futures.

## About Associations

ALL OVER the country associations of radio dealers and radio technicians are either being formed, reorganized or planned. It's a good thing. Such local associations accomplish much good for their memberships and for the communities they serve. Until practically every important community in the country has a firmly established and well-organized local association we would not deem it advisable to attempt the formation of a National Association made up of representatives of all the now small, independent groups.

We, here at RADIO SERVICE DEALER, know of about forty different radiomen's associations. There must be many more that we do know about. I now ask every association to contact us giving the names of the officers, brief but pertinent details about the policies of your group, and any other information that will help us in our efforts to keep in touch with you. We'll also act as a clearing house for the many already established associations that have asked to be kept informed about what their contemporaries are doing. Working in harmony, collaborating with each other as we plan, can do nothing less than work to our ultimate mutual advantage. So, association secretaries, please drop me a line as soon as possible, even though you may believe I already know about your group.

  
S. R. Lowan  
Publisher

From coast to coast  
**SERVICE PROFITS  
 ARE GOING UP**

(and operating costs are going down)

thanks to

**SAMS PHOTOFACT\* FOLDERS**

Here's What Servicemen Themselves Say:

- ✓ "Your folders help give the quick service the public wants—good service, too." *Willis, Tex.*
- ✓ "They easily cut my repair work to half the original time." *Chicago, Ill.*
- ✓ "A great time saver—and cheap enough for the small shop owner." *New York City.*
- ✓ "You have what the serviceman has been waiting for all these years." *Richmond, Calif.*
- ✓ "Wouldn't swap my first set for \$100." *Ashtabula, Ohio.*
- ✓ "They make a big cut in non-productive time—especially in servicing new receivers." *Pascagoula, Miss.*



Time is the most valuable commodity you have. Cut down waste operating time and your earnings go up automatically. You, as a good business man, know that.

But maybe you don't know that Sams Radio PhotoFact Folders reduce non-productive service time by as much as 50 percent. The experience of hundreds of servicemen definitely proves that they do! PhotoFact Folders accomplish this because they give *more complete information—faster—* than any other data that has ever been available.

By means of full-page pictures, comprehensive data, voltage and resistance values, etc., they tell you everything you

\*Trade Mark Reg.

want to know about radios, phonographs, intercommunication systems and power amplifiers manufactured since January 1, 1946. Released in sets of 30 to 50 folders at a time, they reach you when you need them most—just as the products described reach the market. Yet the cost, including membership in the Howard W. Sams Institute, is only \$1.50 a set. (\$1.75 a set in Canada).

Get Sams PhotoFact Folders working for you! Use the coupon below for Sets No. 5 and 6. To bring your files up to date, order the four preceding sets, too. That way your biggest expense will be behind you. Thereafter it will be an easy matter to pay as you go.

**PUBLICATION DATES:**  
 Set No. 5 . . . October 13th  
 Set No. 6 . . . October 26th

Cut This Out and Mail It to Your Distributor! If you do not know his name and address, send it directly to Howard W. Sams & Co., Inc., 2924 East Washington Street, Indianapolis 6, Indiana, and we will see that your nearest distributor gets it. (In Canada write to A. C. Simmonds & Sons, 301 King Street East, Toronto, Ontario.)

CHECK ONE OR MORE SQUARES  
 PLEASE PRINT

- Send Sets No. 5 & 6
- Send Set No. 4       Send Set No. 3
- Send Set No. 2       Send Set No. 1
- Send me a specimen folder

My (check) (money order) (cash) for Sets Nos. . . . . (at \$1.50 a set, \$1.75 in Canada) is enclosed. (If you send cash, be sure to use registered mail.)

Name \_\_\_\_\_

Address \_\_\_\_\_

Zone \_\_\_\_\_ State \_\_\_\_\_

Company Name \_\_\_\_\_

My Distributor's Name \_\_\_\_\_

City \_\_\_\_\_

**In Each PHOTOFACT  
 Folder You Get —**



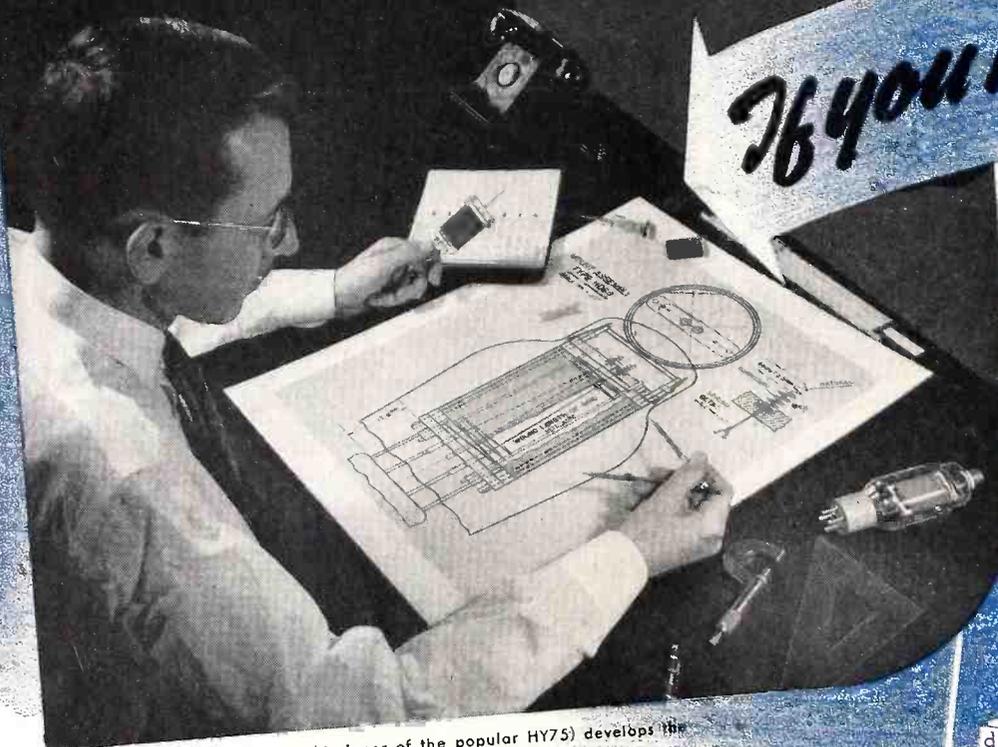
1. A cabinet-view photo of the receiver to help you establish identity and control functions.
2. A top-view photo of chassis and speaker to identify component parts and alignment points.
3. A bottom-view photo of chassis and/or accessories.
4. A complete list giving keyed reference to all parts, alignment and schematic diagram.
5. A complete full page schematic diagram of the receiver with loads of new information shown in a uniform manner.
6. Stage gain measurements listed on the schematic diagram.
7. A complete voltage and resistance analysis chart for rapid check of operational values.
8. Complete alignment instructions on the receiver consistent with the keyed alignment points indicated in top- and bottom-view photos.

**HOWARD W. SAMS & CO., INC. RADIO PHOTOFACT SERVICE**

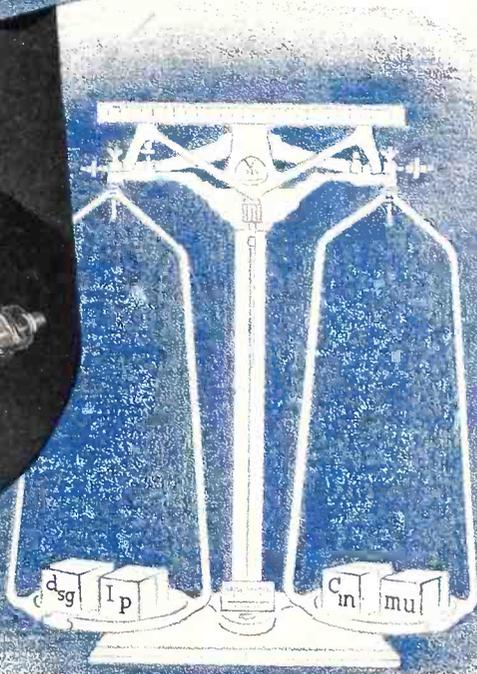
In Canada—write to A. C. SIMMONDS & SONS, 301 King Street East, Toronto, Ontario

# MAKING TUBES *is easy*

## *If you know how!*



Edwin F. Dillaby (designer of the popular HY75) develops the mount structure for a new transmitting triode.



## TUBE DESIGN is a BALANCING ACT

The job of a vacuum tube designer would really make you tear your hair. Drawing mainly on long experience — only the bare principles of tube design are found in books — the design engineer must co-ordinate the innumerable interlocking characteristics you specify.

Using standard parts when possible — hand-fabricating others, he assembles and processes engineering samples. Some characteristics may fall outside limits. Then begins a seesaw of compromises. Screen diameter is lowered; input capacitance rises. Plate current is raised; amplification factor drops. Back and forth teeters the design. Interlocking electrical, mechanical, physiochemical, ceramic, and metallurgical characteristics must be reconciled one after another. Finally the harassed

designer submits apparently satisfactory tubes for application tests.

You guessed it. Changes are required. The balancing act begins anew. Innumerable variables are again co-ordinated. Science and creative craftsmanship triumph; everyone is satisfied. Production takes over. Sure, it's a swell tube. But could this lead be changed, this spacer eliminated, this material substituted? Well, you see what we mean.

Through the years, Hytron design engineers have sweated for you. They have originated: GT, sub-miniature, vhf, instant-heating tubes. They have improved standard types including: OC3, OD3, 1616. Their experience will continue to craft for you the best in tubes.



SPECIALISTS IN RADIO RECEIVING TUBES SINCE 1921

# HYTRON

RADIO AND ELECTRONICS CORP.

MAIN OFFICE: SALEM, MASSACHUSETTS



# America finds a new, easy way to save

OUT of the war has come one blessing—a lesson in thrift for millions of those who never before had learned to save.

Enrolled under the Payroll Savings Plan in thousands of factories, offices, and stores, over 27 million American wage earners were purchasing "E" Bonds alone at the rate of about 6 billion dollars worth a year by the time V-J Day arrived.

With War Bond Savings automatically deducted from their wages every week, thrift was "painless" to these wage earners. At the end of the war, many who never before had bank accounts could scarcely believe the savings they held.

The moral was plain to most. Here was a new, easy way to save; one as well suited to the future as to the past. Result: Today, millions of Americans are continuing to buy, through their Payroll Savings Plan, not War Bonds, but their peacetime equivalent—*U. S. Savings Bonds*.



**From war to peace!** War Bonds are now known as U. S. Savings Bonds, bring the same high return—\$25 for every \$18.75 at maturity.



**Out of pay**—into nest eggs! A wage earner can choose his own figure, have it deducted regularly from earnings under Payroll Savings Plan.



**New homes to own!** Thousands of new homes, like this, will be partially paid for through Bonds wisely accumulated during the next five to ten years.



**Keeping cost of living in check!** Buying only needed plentiful goods and saving the money which would bid up prices of scarce goods keeps your cost of living from rising. *Save automatically—regularly.*

Weekly Savings	SAVINGS AND INTEREST ACCUMULATED	
	In 1 Year	In 10 Years
\$ 3.75	\$195.00	\$2,163.45
6.25	325.00	3,607.54
7.50	390.00	4,329.02
9.38	487.76	5,416.97
12.50	650.00	7,217.20
15.00	780.00	8,660.42
18.75	975.00	10,828.74

**Savings chart.** Plan above shows how even modest weekly savings can grow into big figures. Moral: Join your Payroll Savings Plan next payday.

**SAVE THE EASY WAY...**  
**BUY YOUR BONDS**  
**THROUGH PAYROLL SAVINGS**

*Contributed by this magazine in co-operation  
with the Magazine Publishers of America as a public service.*



# In & Around the Trade

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



**Not Nylons!** Stewart-Warner radio distributors Edwin Flato Co., Houston, Texas, open their new retail display room and these liners-uppers are waiting to see and buy new, post-war radio sets on opening day. Shows how big an attraction merchandise is in this as yet seller's market.

## Tube Prices Higher

Wholesalers and retailers of radio receiving tubes and allied special purpose tubes have been authorized to pass on percentagewise the full 20 per cent increases in manufacturers' ceiling prices granted on May 2, 1946. Effective August 23, 1946, this action complies with the provisions of the Price Control Extension Act of 1946 restoring the percentage mark-ups wholesalers and retailers had on March 31, 1946. This increase in ceiling prices will not change the retail prices of radio sets, since the sales are to tube distributors for replacement purposes only.

## Refrigerators Higher

An increase of approximately 6 per cent in retail prices of household mechanical refrigerators was announced September by the Office of Price Administration. On a standard box, the increase will be from \$10 to \$12. Following the recent announcement of retail price increases for 21 consumer goods lines, this increase, effective August 21, 1946, results in part from a new reconversion price increase of 3.5 per cent granted refrigerator manufacturers. When a previous industry-wide increase was granted manufacturers, OPA required resellers to absorb what

amounted to 2.5 per cent of the retail price. Passing on six per cent to consumers is mandatory under reseller provisions of the Price Control Extension Act of 1946, which require OPA to restore to resellers their percentage mark-ups in effect on March 31, 1946. The present increase on refrigerators completes price increases on consumer durable goods that are required to be made by OPA within 30 days after July 25, 1946 by the date of extension of the Price Control Act.

A method of determining retail ceilings on used 1946 models of all household mechanical refrigerators was announced recently. The maximum cash price, effective August 26, 1946, that may be paid for any used 1946 model, reconditioned and guaranteed for 90 days is 85 per cent of the original retail ceiling of the box when sold new. On "as is" sales, \$3.50 will be deducted from the above amount. An addition of \$5 may be made when used 1946 models are sold under a guaranty for one year or more.

## Product Service Meetings

Although no new appliances were made during World War II, GE actually increased its service training activities. This was done to provide quick servicing knowledge for the new personnel that dealers used throughout the

wartime emergency. General Electric brought out countless new publications and training helps. These were taken out to the dealer groups through G-E distributor organizations by means of numerous "packaged" training programs. Seven hundred and seventy meetings were held from 1942 through 1944 with a total attendance of over 21,000 dealer and distributor people.

With the resumption of appliance production, General Electric is placing even more emphasis on service and the place that service has in every dealer organization. Regional meetings are being held to keep the field fully informed and place dealers in a position to give the best possible service to users of General Electric appliances.

Each meeting lasted five days, with the first four days taken up with detailed discussions of the products themselves, with suggestions for meetings current service problems and with explanation of the design and recommended service procedures for all new products that will be in the field within the next six months.

## Shipping Offer

In an announcement to all its distributors, the JFD Manufacturing Co., 4111 Fort Hamilton Parkway, Brooklyn 19, New York, has made a special freight-saving offer: "On all orders of \$50 or

# At Last!

## A PRACTICAL

# RADIO

## MERCHANDISING

### PLAN

# for Service Engineers

See 2nd Cover

**CONTACT FOR SERVICEMEN**

*Editor:*

The radio servicemen seem to have trouble contacting each other due to the fact that many of them moved during the war and others are still in the armed forces.

In our opinion you are in a position where you can do the radio servicemen a great favor by helping us contact radio men in other cities throughout our country by means of your R.S.D. magazine.

Our local Radio Servicemen's Association has recently been revived and shows signs of our membership growing fast.

After having held a couple meetings we have decided we should find out what some of the groups in other cities are doing. Will you be kind enough to put a notice in the R.S.D. asking radio service men in other cities to write to us so we can do some corresponding.

**John H. Stefanski,**  
 Sec. & Treasurer  
 86 Dixie Ave.  
 Pontiac 18, Mich.

more net, covering dial belts, belt kits, dial cable and cord, also cable and cord displays, shipments will be made freight prepaid. These items should be written up on separate orders. A saving of 5% to 15% will be thus effected."

**Television School**

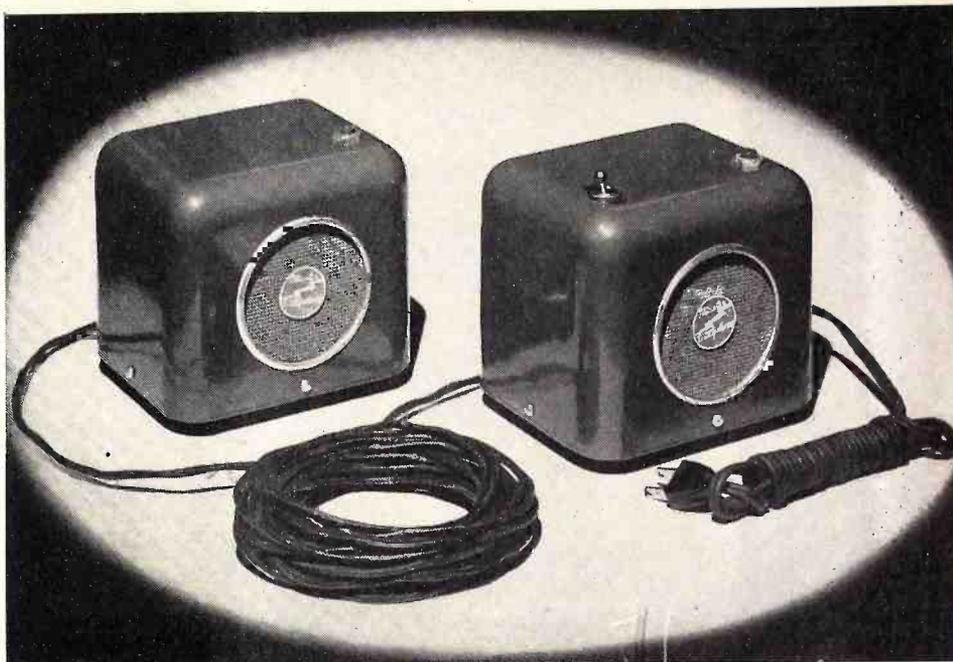
A free school to train employees in television receiver testing is now under way at the Viewtone Television & Radio Corp., announces Irving Kane, president. The course is conducted by chief engineer Albert Nadel, ex-Purdue University. Instruction in testing fundamentals of television and television installation and servicing are given. Sessions are held daily.

**SM for Garod**

The Belle Electronics Corporation announces the appointment of Harry A. Shoorer as Sales Manager of the Garod Radio distributing agency covering greater New York, Nassau, Suffolk, and Westchester counties. Mr. Shoorer's offices are located at 70 Washington St., Brooklyn, N. Y. He just resigned a key position with the Office of Price Administration and was connected with the regional office in the Empire State Building.

**Rate Manual**

The "Radio Service Standard Rate Book" is comprised of six sections covering *auto radios, A.C.-D.C. battery portables, console radios, table model radios, record players and record changers.* Each of these sections outlines the general servicing procedures  
 (See page 13)



The E, K, Master Utiliphone gives an entirely new and bigger value in a two-station intercall set. It's a high quality product in every detail . . . as outstanding in operation as it is in appearance. Offers 1. Individual station control; 2. High Amplification; 3. Operates on AC or DC; 4. Easy to install; 5. Sturdily built. Widely used in small offices, stores, farms, homes and on estates.

The Utiliphone is only one of a big variety of intercom systems, made by many of the best manufacturers, offered for speedy delivery by W-J. Let our Sound Engineers suggest the installation best suited to your needs. Write today for complete information.

**HERE'S A  
 TOP QUALITY  
 INTERCOM  
 AT A  
 POPULAR PRICE**

MAKE W-J YOUR HEADQUARTERS FOR RADIO AND ELECTRONIC SUPPLIES! Have you reserved your copy of the new W-J Reference Book & Buyer's Guide? Use the coupon!

**WALKER-JIMIESON, INC.**

**W-J**  
 RADIO AND ELECTRONIC SUPPLIES  
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Please reserve a copy of the new 1947 W-J Reference Book & Buyer's Guide for us.



INDIVIDUAL \_\_\_\_\_  
 COMPANY \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_

For a fast-moving line



## —hitch on to RCA Preferred-Type Radio Batteries

The Batteries That are Radio-Engineered for Extra Listening Hours

You gain four ways when you carry the line of RCA Preferred-Type Radio Batteries:

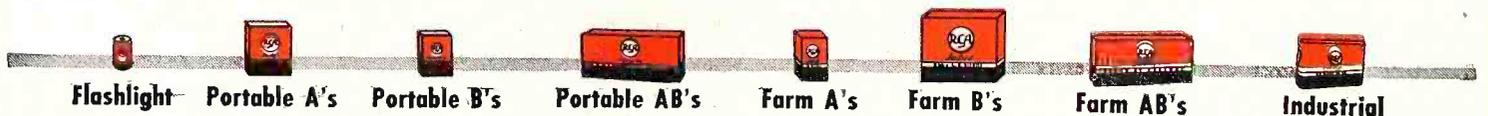
1. **MORE PROFIT**—Relatively few types meet the requirements of 99% of all battery-operated receivers. So, you enjoy increased sales on a smaller inventory.
2. **MORE CUSTOMERS**—The high acceptance value of the RCA seal on every carton will bring more people into your shop.
3. **MORE TO SELL**—You get a 2-product line to

push . . . RCA Preferred-Type Radio Batteries and RCA Preferred-Type Tubes. Your customers will buy both.

4. **MORE REPEAT BUSINESS**—RCA Preferred-Type Radio Batteries are Radio-Engineered to give extra listening hours. Satisfied customers are the result.

You can't do better than phone your local RCA Tube Distributor today for complete details.

Listen to "THE RCA SHOW"  
Sundays, 2:00 P.M., E.S.T., NBC Network



TUBE DEPARTMENT

**RADIO CORPORATION of AMERICA**

HARRISON, N. J.

## IN TRADE

(From page 11)

for each type of set, listing standard rates for various types of repair service. The first rate manual designed for the radio servicing industry. Particularly valuable to the radio service man who is starting out in the field.

Parts prices and tube prices are conveniently listed, plus suggested standard rates for labor, service calls, pickup and delivery, estimates and alignment. The book also contains a comprehensive digest of crystal cartridge data and a registry of electronic manufacturers.

Copies of the book may be obtained for \$1.00 from radio parts jobbers throughout the United States. Published by Oelrich Publications, 1627 South Keeler Avenue, Chicago 23.

### Farnsworth Dealers

(1.) M. L. Krewer of Washington Wholesalers, Farnsworth distributor for the Washington, D. C. territory, has reported an exceptionally large demand for the Farnsworth chair-side phonograph-radio combination, model EK-264. Mr. Krewer states that every dealer who has displayed this model has advised him of a heavy backlog of orders for it.

(2.) The Graham Furniture Company, Englewood, Colo. reports an increase of more than 90 per cent in inquiries for phonograph-radios following the recent installation of a record sales department. According to Joe F. Hull of the Graham Company, the firm is handling only nationally advertised sets such as Farnsworths. Although standard merchandise is still somewhat short, Graham Furniture feels that, especially for the small dealer, only quality merchandise should be handled.

### Norge Appliances

Ten new models of household appliances, including an upright home freezer and five newly-styled refrigerators, are announced by M. G. O'Hara, vice president and director of sales, Norge division of Borg-Warner Corp. The company is also showing two new gas ranges, one new electric range and one new home heater.

### GE Tele-Radio Combination Soon

An all-purpose home entertainment instrument, combining television, frequency modulation, standard broadcast and a record-player, will be produced next year by the Receiver Division of the General Electric Company.

This model will be equipped with a ten-inch picture tube affording a pic-

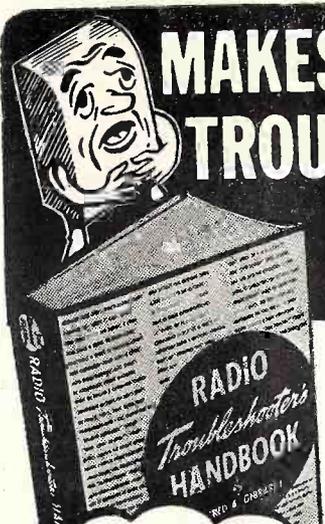
(See page 38)

# MAKES 90 OUT OF 100 RADIO TROUBLES Easy to Repair!

Complete, Easy Instructions for Repairing Common Troubles in Practically Every Model and Make of Radio in Use Today

**Eliminates Needless Testing — Enables You to Repair Two Radios in the Time Ordinarily Required for One**

**PAYS FOR ITSELF ON THE FIRST JOB!**



**TELLS WHAT TO DO EXACTLY HOW TO DO IT**

As valuable to a radio repair man as a recipe book is to a cook!

**\$5**

What's wrong with the radio you want to repair? A defective transformer? Wiring insulation trouble? A faulty capacitor or resistor? Don't guess! Don't waste time in needless, tedious testing! Just look up that particular make and model in Ghirardi's famous RADIO TROUBLESHOOTER'S HANDBOOK. Nine times out of ten, this big book will tell you exactly what is wrong—and exactly how to repair it. You don't have to be an expert to use the HANDBOOK—and there's no better way of getting invaluable, practical service training. Over 400 pages are chock-full of this factual Case History repair data on over 4,800 receivers, auto radios and record changers of 202 different manufacturers—practically every radio set in use today! Over 300 additional pages contain hundreds of repair charts, tube charts, data on tuning alignment, transformer troubles, tube and parts substitution data, color codes—all designed to help you repair any radio ever made **EASIER, BETTER and FASTER.** Ideal for either busy service shops or for beginners. Only \$5 complete — on our 5-Day Money-back Guarantee basis.

**Ghirardi's RADIO TROUBLESHOOTER'S HANDBOOK (above) is the ideal book to have on hand for training new helpers, repairing either cheap or expensive sets quickly and profitably, eliminating needless test time and equipment—and MAKING MORE MONEY.**



## ALL THE SCIENCE OF RADIO-ELECTRONIC SERVICING IN ONE GIANT BOOK

**LEARN AT HOME ... without an Instructor**

Alfred A. Ghirardi's MODERN RADIO SERVICING gives you a COMPLETE, MODERN EDUCATION in truly professional radio-electronic service methods of the kind that will be your "Open, sesame!" to the big-money opportunities that only well-trained servicemen are in a position to grasp. It is a complete, scientific servicing course from A to Z. You'll be surprised how easily understandable it makes every phase of the work even if you have had no previous service training. And, if you are already in the business, you'll be pleased to learn how this big 1300-page book will serve as a "refresher" course. Not only will it help you handle repair jobs quicker, better and more profitably, but it also will give you the necessary basic training to equip you for profitable industrial electronic work. Specifically written and designed for home study. 1300 pages; 706 clear illustrations. 720 Self-Test Review Questions make it easy for you to check your progress every step of the way. Fully indexed. Only \$5 on our famous 5-Day Money-back Guarantee.

**ENDORSED BY EXPERTS EVERYWHERE**

From beginning to end, MODERN RADIO SERVICING brings you the kind of modern professional "Know How" that will pay big dividends for years to come. Gives complete data on test instruments and their use, preliminary trouble checks, scientific circuit analysis and trouble-shooting, parts repair and substitution, how to start and operate a successful service business and hundreds of other subjects.

### MONEY-BACK GUARANTEE

MURRAY HILL BOOKS, Inc., Dept. RSD-106, 232 Madison Ave., New York 16, N. Y.

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

Name .....

Address .....

City & Dist. No. .... State .....

### SPECIAL OFFER!

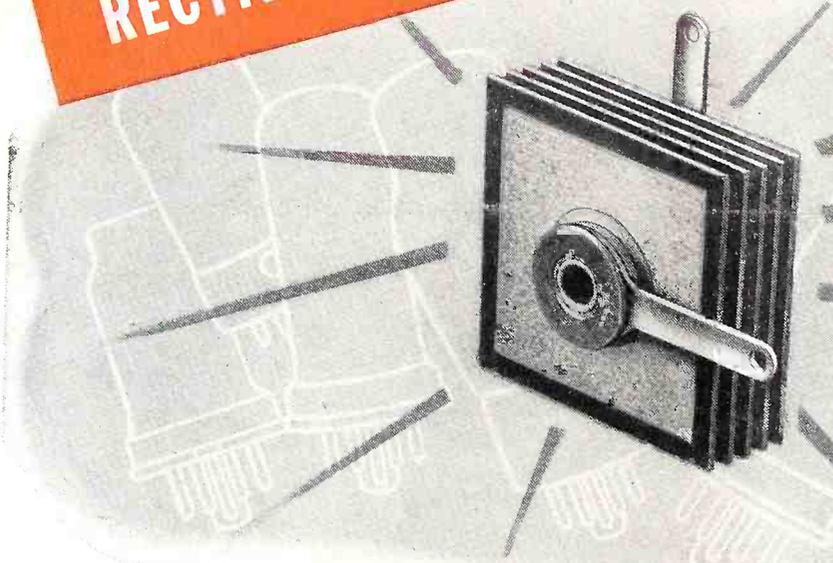
Let RADIO TROUBLESHOOTER'S HANDBOOK save you time on common radio service jobs! Let MODERN RADIO SERVICING train you for complete professional, electronic work. Get BOTH BIG BOOKS at the special price of only \$9.50 for the two. Send coupon today!

**29 DIFFERENT  
RECTIFIER TUBES**

*Now Replaceable*

**WITH THE FEDERAL SELENIUM RECTIFIER**

(No. 403D2625)



**IT'S SMALLER...**

**COSTS LESS...**

**LASTS LONGER...**

**RUNS COOLER...**

**READILY INSTALLED!**

**-FIRST OF ITS KIND IN THE INDUSTRY!**

NO less than *twenty-nine* different types of rectifier tubes are now replaceable with Federal's new, miniature, 5-plate rectifier. Available now, this replacement is also an *improvement!* For not only does it subtract from your own manufacturing costs, it adds to product quality as well . . . and to consumer satisfaction. Here's how:

- Saves space — only 1¼ x 1¼ x 11/16 inches — fits where tube won't
- Costs less than tube and socket it eliminates
- Long life — built to last the life of the set
- No warm-up period — starts instantly, runs cooler
- Installed in less time than tube — only two soldering jobs
- Sturdy, all-metal construction — not easily damaged
- Withstands overloads — even when charging deformed electrolytic condensers

Every one of Federal's line of "Center Contact" Selenium rectifiers is designed to give the full measure of performance that have made them the standard of the industry. A Federal engineer will show you how to put this latest model into your circuits. Write for details to Department F455.

**Replacement for these Tubes:**

5T4	5Y3	6Y5	25Z6	50Y6
5U4	5Y4	6Z5	35W4	50Z7
5V4	5Z4	12Z5	35Z3	117Z3
5Z3	6X5	7Y4	35Z4	117Z6
5W4	0Z4	12Z3	35Z5	0Y4
5X4	80	25Z5	35Z6	

**Electrical Characteristics:**

Maximum RMS Voltage	130 Volts
Maximum Inverse Voltage	380 Volts
Maximum Peak Current	1200 ma.
Maximum RMS Current	325 ma.
Maximum DC Output	100 ma.
Approximate Rectifier Drop	5 Volts

Two Federal Miniature Rectifiers in a voltage doubler circuit gives 250 volts and 80 milliamperes output from 117 volt AC power source.

*Federal Telephone and Radio Corporation*

In Canada:—Federal Electric Manufacturing Company, Ltd., Montreal  
Export Distributor:—International Standard Electric Corporation, 67 Broad St., N. Y. C.



Newark 1,  
New Jersey

# TELEVISION — A Great New Industry

**C**OMMERCIAL television throughout the United States will be a reality within a year. The unique value of television is that it combines the best features of radio, movies, opera, and the concert stage. Television carries a static-free FM channel for voice, and a frequency which will result in pictures as good as the best 16 millimeter home movie. Television is really a new art form, with unlimited possibilities for broadening the cultural horizon of the nation's families.

Television also has another unique merit. Television permits the display of a product and a demonstration of how it is used. Under the circumstances, it becomes extremely valuable as an advertising medium. Instead of demonstrating a new washing machine to three or four customers at a time, television would permit a demonstration to be extended to thousands of potential customers at one showing. By the same token, new automobiles can be shown as easily as new washing machines, or new electric irons, or the latest fashions in ladies', men's and children's clothes, or new furniture, or anything which has "eye-appeal" or "use-appeal."

There are dozens of commercial sponsors today using television experimentally—trying to perfect their advertising technique. By and large, most of the experimentation in television broadcasting today is along the lines of commercialization, rather than along the lines of public education and entertainment. Because of the fact that most of the personnel in television today have come from radio, there seems to be some danger that television may degenerate into an animated radio broadcast, with all the singing commercials and 'spots' not only grating on our ears but also on our eyes.

## All Around Entertainer

In general, commercial television will present three major types of programs:

(1) Live shows, which will include soap operas, musical operas, comedies, and the whole gamut of entertaining features; these will constitute about 50 per cent of the telecast schedules.

(2) Short films which will last no longer than 15 to 20 minutes.

(3) Pick-ups, which will feature sport events and which will be telecast directly from the ringside, or ball park, or even bowling alley.

A proposal that the television set manufacturers and the television broadcasters set up an industry-wide committee to draft and enforce a code of ethics against excessive commercialization of television programs, was made October 1 by Joseph Gerl, speaking before the Poor Richard Club, in Philadelphia. The article is based on this speech.

by **JOSEPH GERL\***

Then also, educational programs will be presented, because teachers have found that the bulk of learning is acquired visually. Television will be able to present instruction and classes for young and old. Listeners will not only be able to study painting and piano via television, but also how to use the latest food recipes, and even how to speak foreign languages.

As an advertising medium, television will not compete with newspapers, radios or magazines. Newspaper ads are predominately price and comparative value advertising. Television cannot do that. Radio advertising is mainly institutional, repeating a brand name over and over. Television cannot do that either. National magazines do show the product, and sometimes beautifully illustrated, too, but the cost of a national television hook-up to reach the same size audience as reached by a magazine, would be so far out of line, that magazines have given up worrying about television competition.

Television as an advertising medium will complement all other forms of ad-

—\*President, Sonora Radio and Television Corp.

vertising, and will be used mainly to show a product and demonstrate how it works.

## New Jobs

The growth of television as an industry should add considerably to the nation's employment. Since in the next decade there will be about 25,000,000 new television sets sold, the industry calculates that about 2,500,000 new jobs will be created for television retailers distributors, service and repair men, for employees in the television set factories, for television engineers and for a host of actors and actresses who will produce the hundreds of thousands of television shows annually. Veterans with radar and electronic training will be of utmost value.

But all this growth is predicated on the hope that the television industry—both manufacturers and broadcasters—will awaken early enough to the dangers of sinking into the same commercial pit that has swallowed radio broadcasting. If, however, by self-regulation the industry can avoid that danger, television will enrich the life of every American family.

## LEARN ABOUT TELEVISION SERVICING

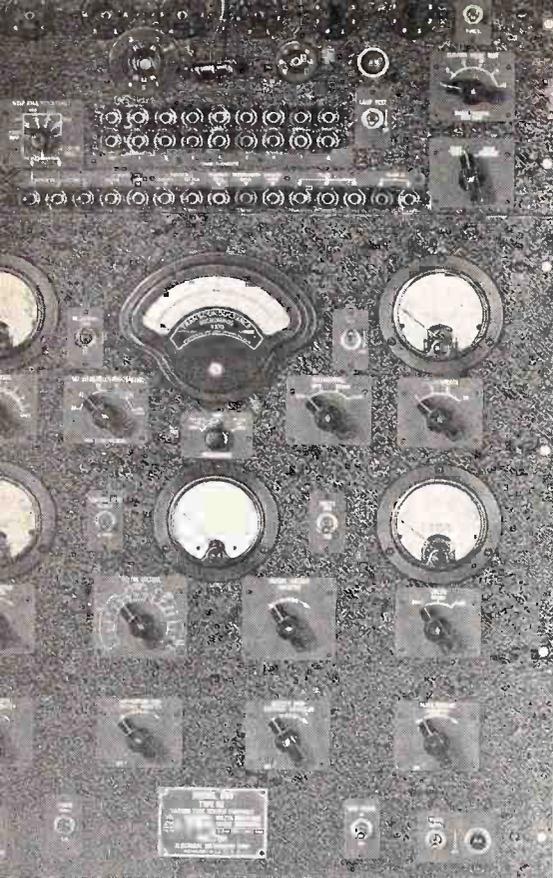
**B**Y mid-1947 about 24 per cent of the nation's population in 9,086,000 wired homes will be within the effective service range of television broadcasting stations.

Pre-war experience indicates that manufacturers of television receivers should assume responsibility for installing and servicing their television instruments. To begin with, manufacturers plan to establish their own service shop facilities, manned by competent and trained personnel, in all of the existing television-range market areas: New York, Philadelphia, Chicago and Los Angeles.

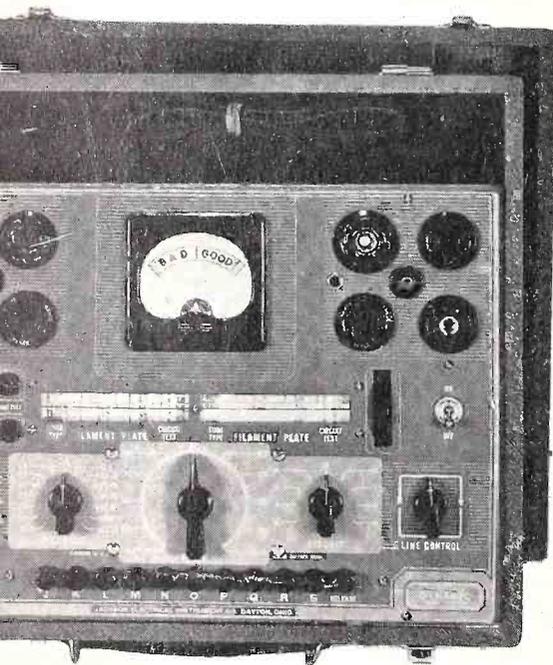
In addition some firms will undertake an intensive program of continuous education to train wholesale distributors, dealers and radio technicians in the fundamental techniques of television installation, servicing and maintenance.

# MODERN TUBE TESTING

Article 3 in a series. (See April and June)



Representative types of tube testers available today. Above, Weston 686. Below, Hickok 532. (See text)



ling and metering the plate, screen, suppressor and grid voltages and currents. A microammeter is also included for measuring grid current.

One variable AC power source is furnished along with a volt-meter for measuring and applying correct rated heater potentials. A second AC supply furnishes a controllable, metered sixty cycle AC signal for the control grid of the tube.

In operation rated voltages are set up for each tube element per the tube manufacturers specifications, a measured AC signal is applied to the grid and measured in the plate circuit by means of a rectifier type voltmeter. Direct calibration of the meter in micromhos is then possible. Since the measurement of mutual conductance is made under exact, rated conditions the final indications are absolute.

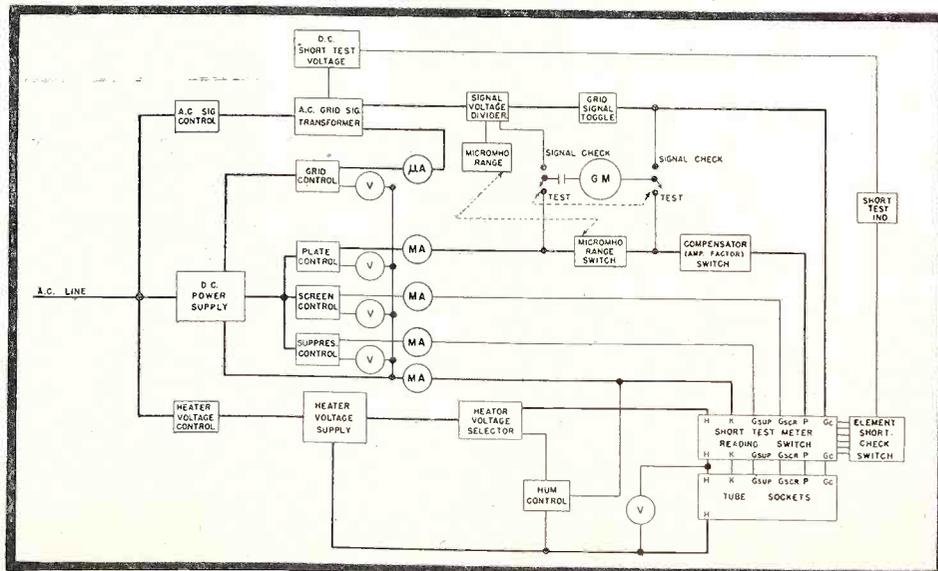
In addition to mutual conductance determination it is also possible to observe plate current characteristics with various non-rated or rated operating conditions and to study other miscellaneous tube characteristics on an instrument of this type.

A conventional neon, hot short test circuit is also included. All tube elements are connected to their potential sources, meters, etc., by means of patch cords or jumper leads.

## Hickok Model 532

This is a mutual conductance measuring device of moderate price using a very ingenious basic circuit. The complete wiring is shown in Fig. 3. Although the switching and general circuits are rather difficult to follow the tester can be broken down to the circuit essentials shown in Fig. 4.

Figure 2. (Block diagram, Weston 686)



**T**HIS article will cover some of the more complex types of tube testers on which data has been released. Several newer types have recently been announced but technical information is not as yet available for publication.

## Weston Model 686

This is a true mutual conductance tester although it is most complex and as a result rather costly. A complete wiring diagram is given in Fig. 1. To simplify analysis of the design a block representation of the principal sections is given in Fig. 2.

The heart of this tube analyzer is a completely variable DC power supply with provisions for separately control-

Two DC power supplies are used. The 5V3 tube rectifies 160 volts AC to supply a fixed screen voltage at R6 while variable bias voltages are controlled by the arm of potentiometer R7. The bias circuit passes through the 5-volt transformer winding then applying about 5 volts of AC signal and DC bias to the grid of the tube.

The Type 83 tube rectifies a 170-volt AC potential to supply DC plate voltage for all tubes under test. Each plate winding of this power supply is isolated and a DC milliammeter is connected between the two low potential ends of the windings. Rf and R5 form a tandem potentiometer used to control the meter sensitivity while R16 to R20 serve as shunts on the meter for the various mutual conductance ranges.

If no signal were present on the tube the normal plate current would be drawn equally from each 170-volt transformer winding. As a result the currents would buck one another in the meter and the instrument will read zero. When the grid signal is applied a corresponding AC component appears in the plate of the tube and thus in each 170-volt plate winding this AC component causes a phase shift in the plate transformer windings resulting in an unbalanced condition deflecting the meter. The amount of deflection is thus proportional to the AC signal component and can therefore be calibrated directly in micromhos or mutual conductance.

For detecting excess grid current a resistor R8 is inserted in series with the tube grid. Tube quality readings are taken with switch S closed and R8 shorted out. When switch S is opened any excess gas or grid current will result in a voltage drop across R8. This voltage will effectively alter the grid bias and therefore change the amount of deflection on the meter indicating the excessive gas or grid current condition.

Since only one plate and one screen potential are available for all classes of tubes many types must necessarily be tested under non-rated conditions. Only one signal potential of about 5 volts is applied to the grids of all tubes to obtain sufficient phase shift in the plate supply transformer. This is a rather high order of signal for some tubes and as a result those tubes may be tested under a positive grid condition which is non-standard.

### Precision Models 910-12-14-15

This design is also listed as a Dynamic Mutual Conductance tester (Fig. 5.) Analysis of the circuit follows:

In the lower left portion of the diagram the switch assembly marked S1, by means of the moving contact design-

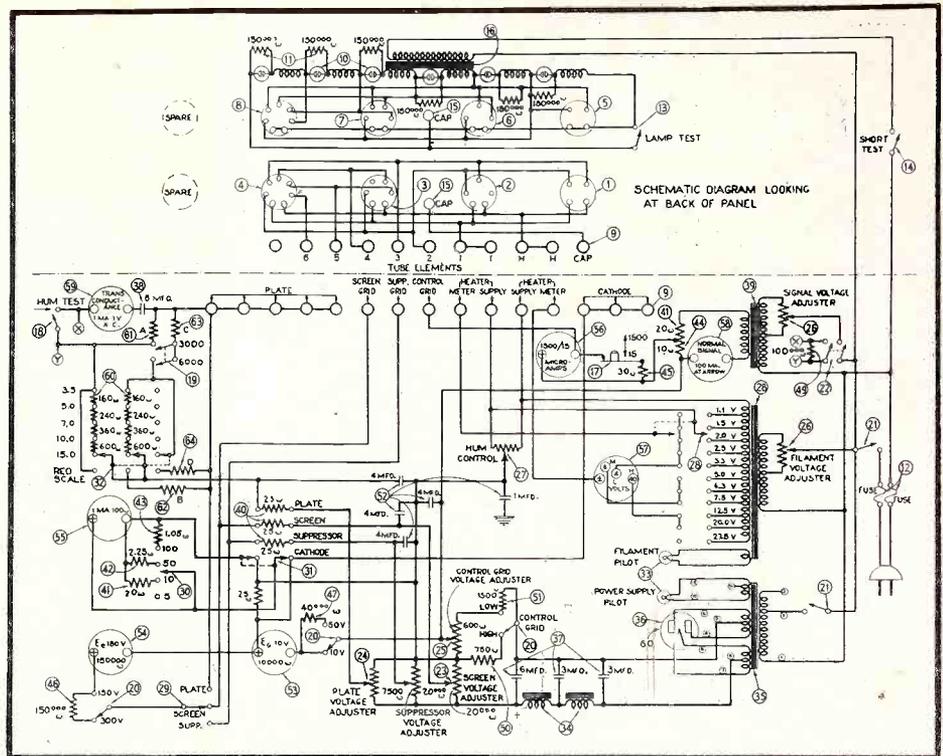


Figure 1. (Schematic, Weston 686)

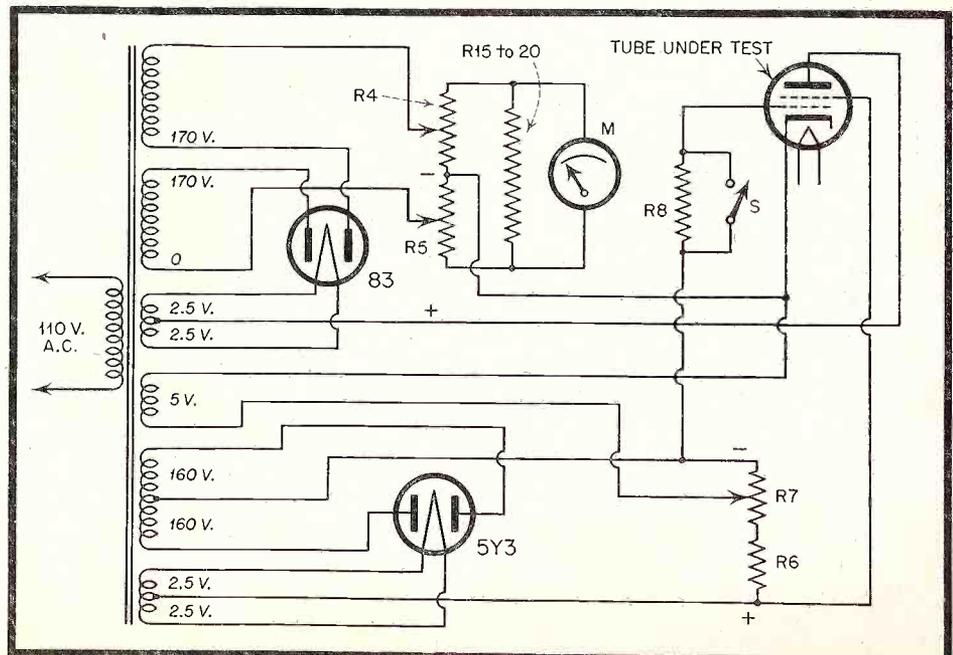
nated with the arrow, selects the grid of the tube to connect it through R1 to the arm of potentiometer R4 across the 50 volt winding of the transformer thus supplying anywhere from 0 to 50 volts AC to the tube grid. The remainder of the switch contacts are shorted together and connected to the O end of the transformer winding.

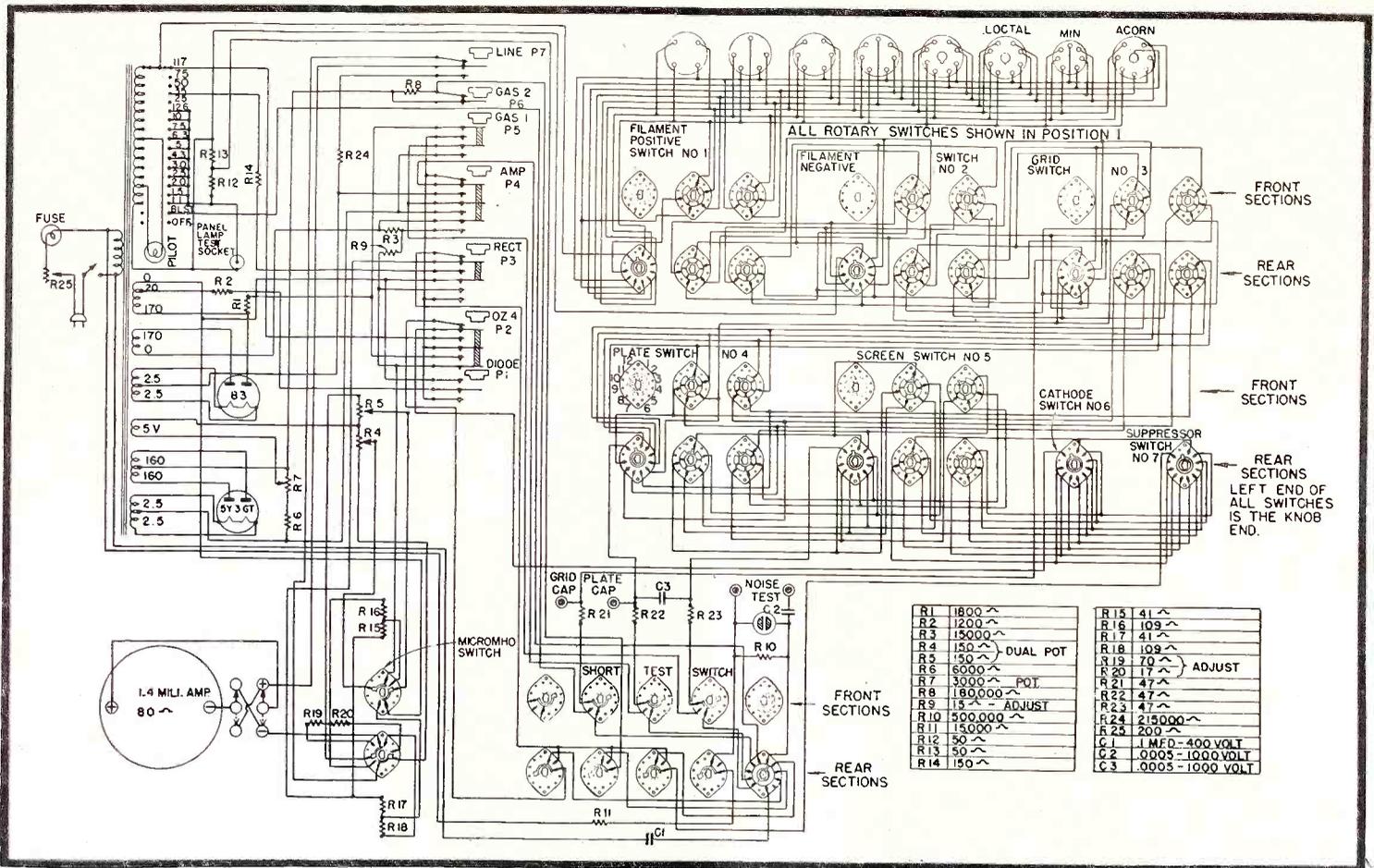
The switch immediately above marked S5 is a push button assembly serving various functions. The first two positions at the left act as an ON-OFF switch. The three switches at the extreme right end of the group are used for inserting the meter in either the tube plate circuit or in the AC line for line voltage adjustment. Positions A to

J normally pass all tube elements down through S1 to 0 volts on the transformer or to the grid voltage supply. When any one of these switches is depressed corresponding tube elements are moved up to the lower deck of the upper switch S3 where the moving contact picks off the plate, or the shorting ring selects the screen applying the screen voltage from R14 which is a voltage divider in series with the meter across the higher plate voltage winding of the transformer.

The upper deck of S3 is used to select various AC plate potentials through load resistors R10, R9, R8 or R7 to the transformer where 50, 175 or 300 volts AC are available. Switch S4 is used

Figure 4. (Circuit essentials, Hickock 532)



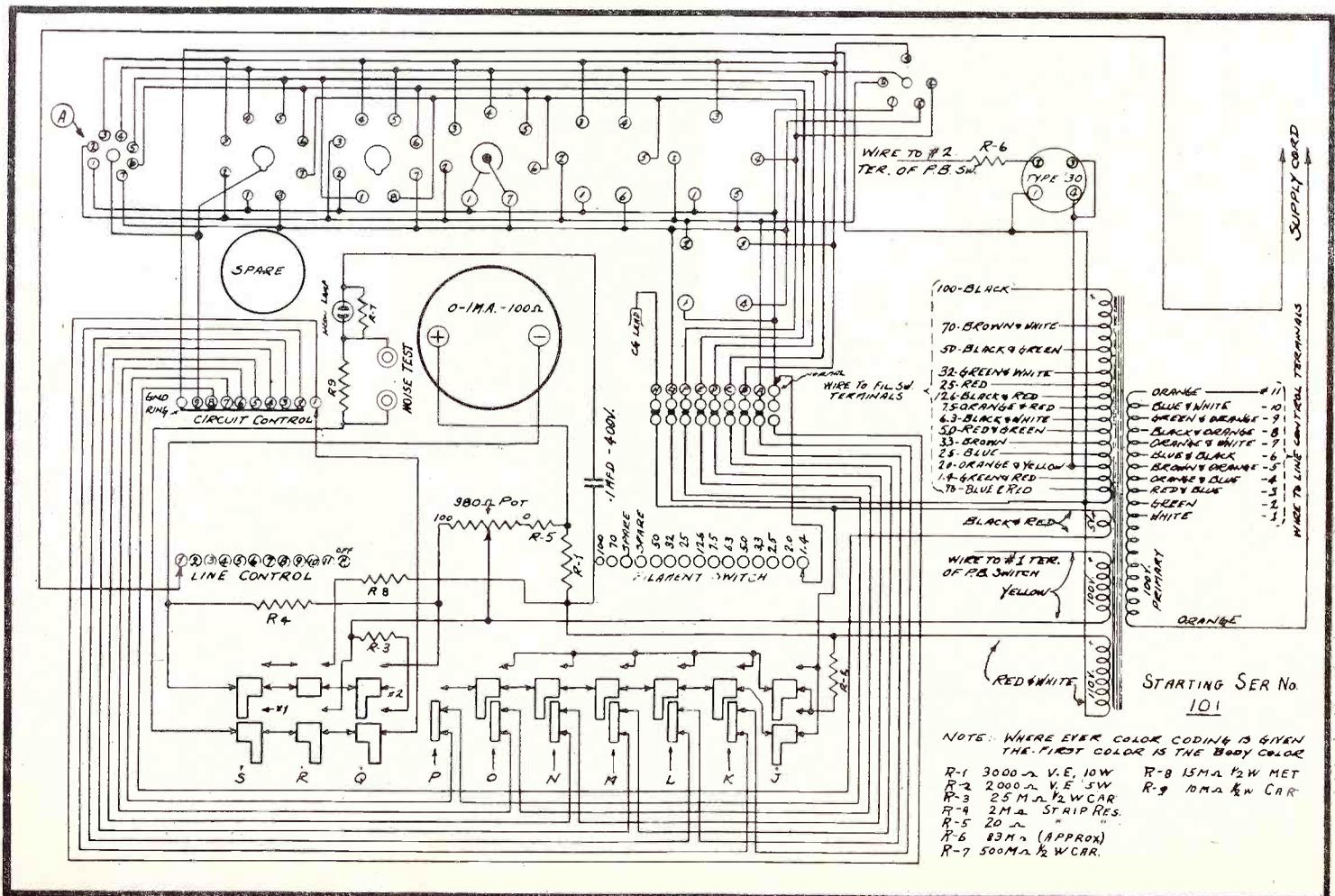


Above: Figure 3. Hickok 532. Below: Figure 7. Jackson 636

to pick off the proper filament pins.  
Since all plate and screen voltages

are AC the AC grid voltage acts as  
bias not as a signal and should be con-

sidered in terms of its DC equivalent.  
All AC voltages could be replaced with



DC potentials and similar performance obtained.

Fig. 6 represents a simplified basic diagram of the Precision design. It can be seen that the meter measures plate current with a given set of plate, screen and grid voltages. No measurement of an AC signal is made and there is no reading of plate current with a shift of grid bias. It measures plate current or emission under various separate element potential conditions instead of tying all elements together as in the conventional imission tester.

### Jackson Model 636

The Jackson tube tester is shown in Fig. 7. This design has for years been referred to as a Dynamic Output tester. The most interesting feature of this tube tester is the very ingenious switching arrangement for separating and selecting the various tube elements.

In the lower section of the diagram the push button switches P to J connect either the grid or screen voltages as needed, shunting all other electrodes up to the left center switch where the plate of the tube is separated, permitting the plate potential and plate load to be connected through Q and R. The balance of the electrodes are then connected to the low potential side of the power supply. This switching works out as follows:

When switches P to J are in their normal position, as shown, each tube element passes through the lower contact slug on out and up to the rotary switch represented in the left center portion of the illustration. Here contact 8 of the switch connects the lower end of the 5 volt grid winding while the unnumbered contact, representing the shorting ring, connects all elements and the low side of the grid winding to the low side of the filament winding and the low side of the 110 volt screen winding at the transformer.

In operation the tube test data may specify that, for example, switch L be depressed for test. The lower contact slug of L will then move up discon-

Figure 6. (Precision.)

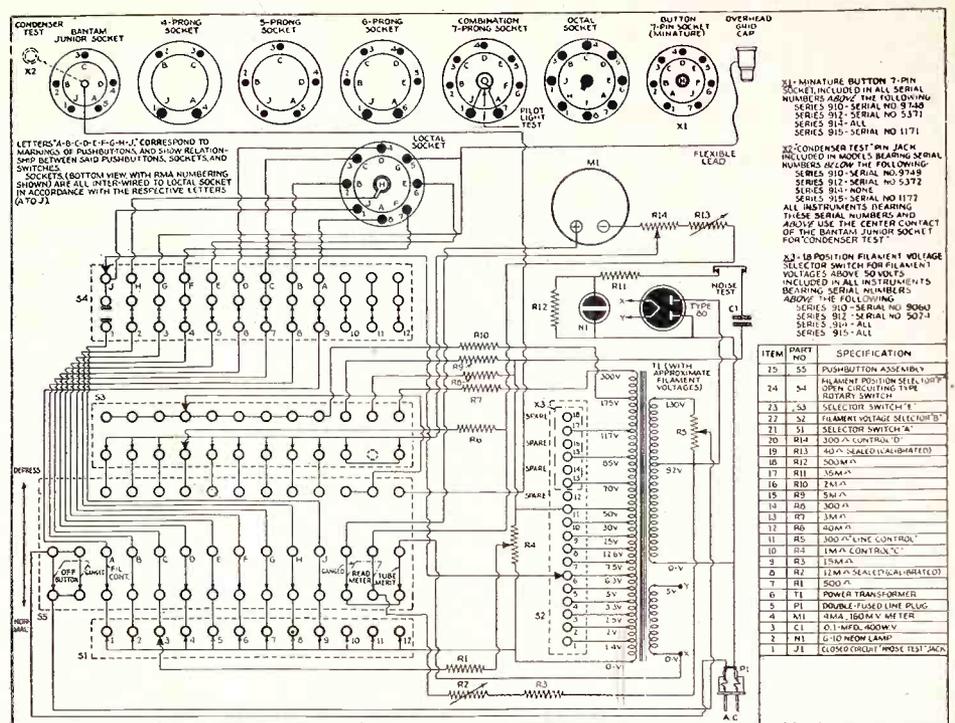
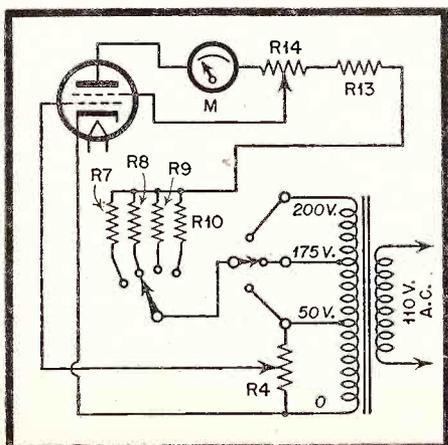


Figure 5. (Precision, Models 910-12-14-15).

necting the element from the rotary plate selector switch. The element coming into switch L will then pass up through the third contact of the switch through the upper slug of K, down through the lower section of J to the high side of the 5 volt grid winding thus applying 5 volts AC to the grid.

When screen grid tubes are tested an additional push button will be specified in the test data, for instance N. When N is depressed the element at that point passes up out of the third contact of N through the upper section of M and L, however since L has previously pushed the upper slug it has moved to its upper position thereby removing it from the grid winding circuit; as a result N circuit passes to the right through upper contact of L then through the upper section of J to R2 and the upper end of the 110 volt screen winding.

When switch S is in its normal position the neon lamp short test is applied to all tube elements. When S is depressed the upper end of the 100 volt

Fig. 8. Testing pentodes. (Jackson).

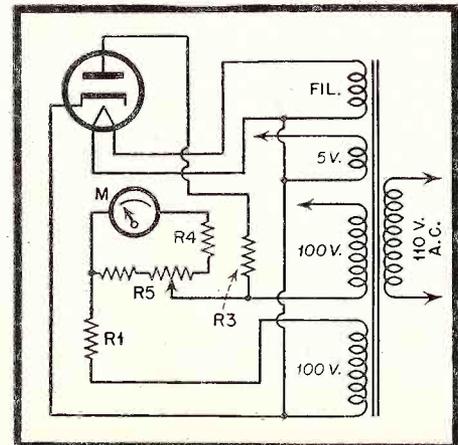


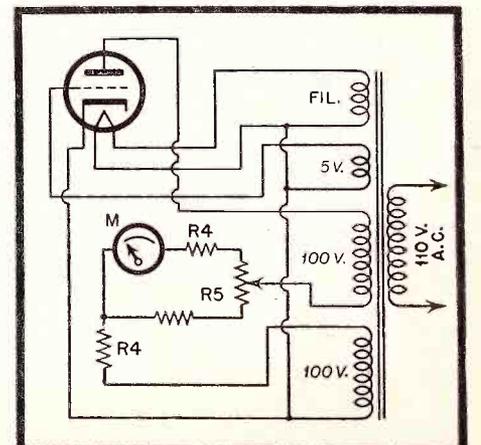
plate winding passes through the lower slugs of R and Q up to the plate selector contact of the plate selector switch. Tracing back through the plate winding of the transformer, the plate circuit goes through the meter and meter shunt network, through the 3000 ohm plate load resistor, through the 110 volt screen winding to the low potential or grid return circuit.

Fig. 8 shows a simplified diagram of the test circuit which results when testing pentode types of tubes. Fig. 9 shows the arrangement for testing triod types while Fig. 10 indicates the changes which occur when testing diodes. Note that a plate potential of 110 volts AC is applied through the 3000 ohm plate load and an additional 25000 ohm plate load R3.

Examination of the circuit shows that for all amplifier tubes only one plate voltage, one screen voltage, one grid voltage and one plate load are available. The DC meter measures plate current only and all AC element

(See page 40)

Fig. 9. Testing triods (Jackson)



potentials can be considered as equivalent DC values. The grid voltage is not shifted therefore this design must also be considered as a plate current tester or emission tester with separate element potentials.

It is hoped that this series of articles will have adequately shown to all readers that any design of present day moderately priced tube testers involves the necessity of short cuts and the testing of many types of tubes under non-rated or non-standard conditions. It is practically impossible to duplicate the test results obtained on any two types of tube testers. Out of each design the results obtained will be only those of which it is capable.

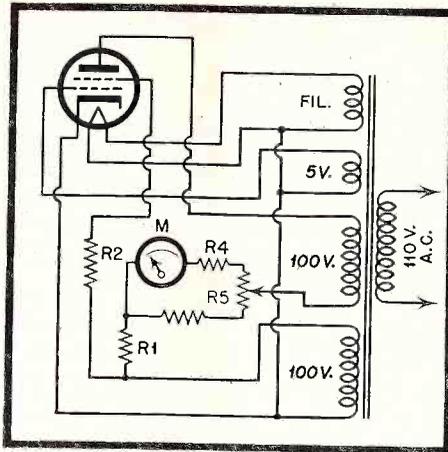


Figure 10.  
Jackson Model 636 Showing  
Diode Test hook up.

## Receiver Repair Jobs THAT SATISFY

by C. P. ZIMMERMAN

**M**OST servicemen in repairing radio receivers, always use the best replacement parts obtainable. This is a matter of good business and reduces the chances of having to make

good on the usual ninety days service guaranty period to the customer. It is of course also good business to go one better by such things as replacing 400 volt working value condensers with

600 volt condensers, and  $\frac{1}{4}$  or  $\frac{1}{2}$  watt resistors with 1 or 2 watt resistors where space will permit.

### Check Condensers

One item often overlooked is the condenser from the plate of the last audio tube to ground or cathode, shown as C1 in Fig. 1 for single ended audio stages, and C1a and C1b for push pull audio stages. Only a few receivers with push pull audio have C1a and C1b connected from plates to ground, but a few do exist. Most have the condenser across the output transformer from plate to plate, the most desirable location.

Condenser C1 is the hardest working condenser in the entire receiver as it has across it almost the entire DC voltage developed by the rectifier plus the audio voltage coming out of the audio stage. A replacement for this condenser therefore should have a higher voltage rating than any others in the receiver, say 600 volts where 400 volts was used in the original receiver.

It is of course well known to servicemen that a shorted condenser at this location invariably brings on other failures in the receiver, as the output transformer primary and filter choke or resistor is then shorted across the rectifier output. On occasion set owners try to make their sets recover, by turning them on and off several times and leaving them on for long periods. Usually the weakest link in the chain will burn out resulting in a costly repair job. If this happens during a ninety day guarantee period, it is the serviceman who has to repair the faulty condenser and the other parts ruined by it.

The plate bypass condenser is used to improve the characteristic of the load the output transformer and speaker reflect on the last audio stage. Its omission results in a high pitched squally tone or even in some cases, audio feedback or oscillation.

However, the advantages of having the condenser can be retained, but threat of its failure damaging other parts can be eliminated, by simply connecting the condenser across the primary of the output transformer as shown in Fig. 2 for both single ended and push pull stages. In this location a shortened condenser will short only the audio output without shorting the power supply in any way.

As shown in Fig. 2, the condenser then is in series with the last filter condenser C2 and cathode bypass condenser C3 before it reaches the cathode of the audio tube. This would make only a slight reduction in effective capacity of C1, as condensers C2 and C3 are

(See page 40)

Figure 1.

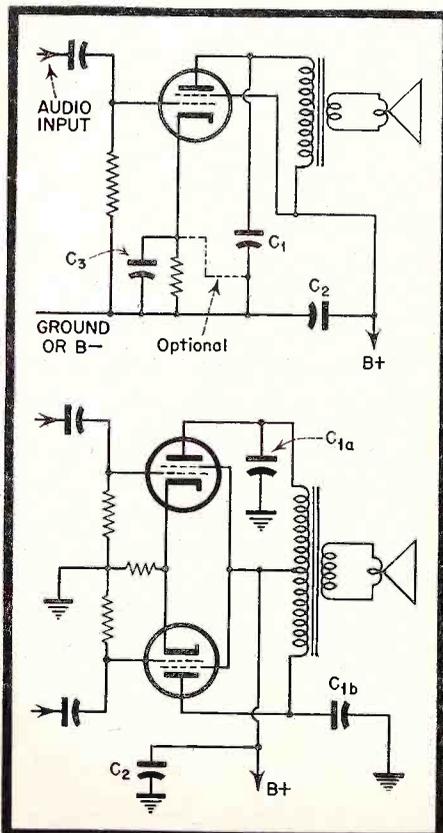
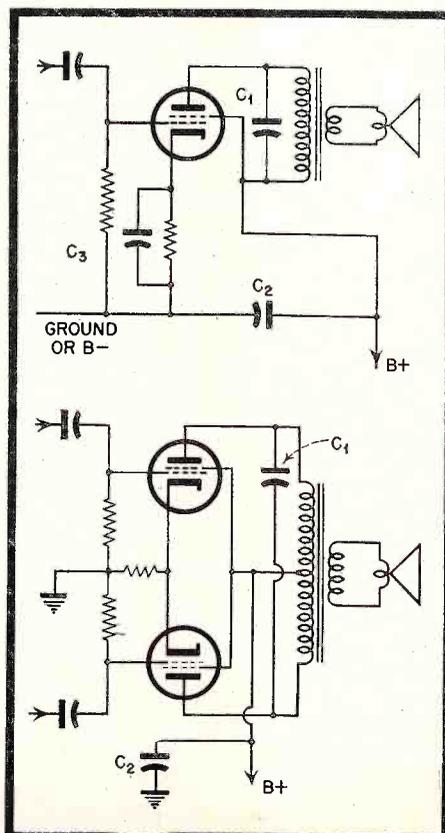


Figure 2.



Manufacturer	Model	Price	No. of tubes*	PICKUP				SPEAKER				FREQUENCY RANGE	
				FM	Type	Weight on record (ounces)	Power output (watts)	Type	Diam. (inches)	Magnet weight (ounces)	Pickup (cycles per second)	Speaker	
Ansley	32	\$ 200-250	7	no	crystal	1	4.5	dynamic	8	field†	50-8,000	100-6,000	
	53	350-700	17	yes	crystal	1	10	dynamic	12	field	50-8,000	60-8,000	
	63	450-800	22	yes	crystal	1	15	coaxial	{ 12 } 5	field	50-8,000	50-15,000	
Bendix	747B	250	6	yes	crystal	1	5	magnetic	10	8	50-5,000	50-5,000	
	1417A	350-400	13	yes	electronic	0.75	15	coaxial	14	field	50-10,000	50-12,000	
Brunswick		500	16	yes	crystal	1	20	dynamic	12	5	30-11,000	15-15,000	
	Caphart	114N2	895	21	yes	resistance	1	18.5	dual	{ 15 } 5	field	50-10,000	50-12,000
Caphart Panamuse	112N2	995	21	yes	resistance	1	18.5	coaxial	{ 15 } 3	field	50-10,000	50-12,000	
	406N	1,295	23	yes	resistance	1	30	magnetic	12	7	50-10,000	50-12,000	
	19N3	495	21	yes	resistance	1	14	dual	{ 12 } 5	field	50-10,000	50-12,000	
	26N2	550	21	yes	resistance	1	18.5	dual	{ 15 } 5	field	50-10,000	50-12,000	
	13N2	675	21	yes	resistance	1	18.5	coaxial	{ 15 } 3	field	50-10,000	50-12,000	
E.C.A.	206	175	8	yes	crystal	1.5	4	magnetic	12	7	100-6,000	70-10,000	
	209	275-325	11	yes	crystal	1	12	dynamic	12	field	50-10,000	50-10,000	
Emerson	537	160	9	yes	crystal	1	—	magnetic	12	6.18	—	—	
Espy Philharmonic	10836A	180	7	no	crystal	1.25	8	magnetic	10	6.8	50-7,000	50-7,000	
	11026A	210	9	yes	crystal	1.25	8	magnetic	10	6.8	50-7,000	50-10,000	
Fada		150-200	10	yes	crystal	1	4	magnetic	10	3	50-7,000	50-9,000	
Farnsworth		134	5	no	crystal	1	3	magnetic	10	6.8	50-8,000	50-8,000	
		165	7	no	crystal	1	8	magnetic	12	6.8	50-8,000	50-8,000	
		185	9	yes	crystal	1	8	magnetic	12	6.8	50-8,000	50-10,000	
		225	13	yes	crystal	1	14	magnetic	12	21	50-8,000	50-12,000	
Fisher	S1	885	23	yes	crystal	0.9	38	coaxial	{ 15 } 5	96	30-12,000	30-15,000	
	S2	1,000	23	yes	magnetic	0.9	38	coaxial	{ 15 } 6.5	96	30-12,000	30-16,000	
General Electric	326	198	7	no	magnetic	1	4	magnetic	12	6.8	—	70-5,500	
	417	325-350	9	yes	magnetic	1	4	magnetic	12	9	—	60-10,000	
	502	425-450	12	yes	magnetic	1	14	magnetic	12	9	—	60-8,000	
	Musaphonic	475	14	yes	magnetic	1	19	dual	{ 10 } 10	14.5	—	60-10,000	
Magnavox	Contemporary	262	7	no**	crystal	1	12	dynamic	12	14.5	50-8,000	50-8,000	
	Belvedere	388	10	no**	crystal	1	25	dual	{ 12 } 12	field	50-8,000	50-8,000	
Majestic	12FM475	425	11	yes	crystal	1	14	dual	{ 10 } 6	field	70-7,000	26-12,000	
Meissner		850	26	yes	crystal	1	20	coaxial	{ 15 } 5	25	30-10,000	30-15,000	
Scott	800-B	1,042	20	yes	crystal	1.75	18	coaxial	{ 15 } 5	104	50-7,500	50-15,000	
Stromberg-Carlson	1121	200-250	10	yes	crystal	1.25	8	dynamic	12	field	60-4,500	65-5,500	
	1135	600	14	yes	crystal	1.25	19	dynamic	10	field	60-4,500	65-9,000	
Westinghouse	Musical 14	257	12	yes	crystal	1.25	17	dual	{ 8 } 8	field	-8,500	-8,700	
	Symphonic 14	309	12	yes	crystal	1.25	17	dynamic	12	field	-8,000	-8,000	
Zenith	6R087G	146	5	no	crystal	1.5	6	dynamic	10	field	—	—	
	9H081	229	7	yes	electronic	0.67	6	dynamic	12	field	—	—	
	12H090	314	9	yes	electronic	0.67	12	dynamic	14	field	—	—	

\*Less rectifiers and tuning eyes.

†In dynamic speakers, the cone's magnetic field is created by a current passing through a field coil.

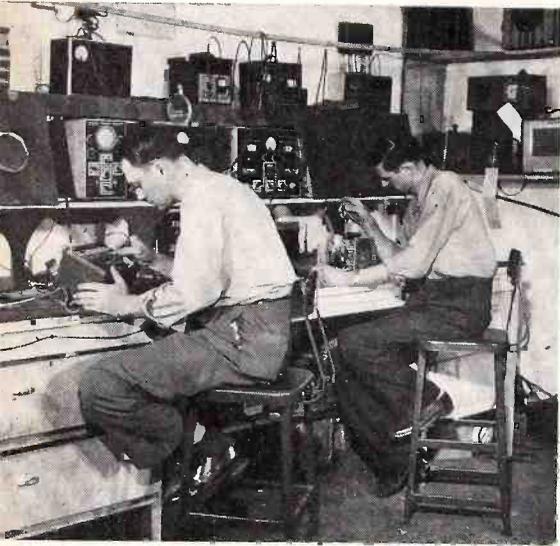
\*\*Addition of eight-tube FM chassis optional.

[Reprinted from FORTUNE, October, 1946]

### Partial List of Typical Radio Combinations

#### DEALERS WILL SELL IN 1947

The above tabulation appears in an article, "Music for the Home" in the October issue of FORTUNE, and is reproduced here with permission of the publishers. Comment on the table is to the effect that the description of new combinations is hardly complete. "At this writing, sales and engineering specifications of the new Philco, Crosley and RCA-Victor combinations are not available. In all cases, specifications given are those of the manufacturers. . . Prices are manufacturers' estimates for each chassis in its least expensive cabinet, subject to OPA approval." (The table is headed, "Buyer's Guide for 1947 Console Combinations," and appears on page 195 of the issue referred to).



**Top:** Array of modern test equipment is used by Earl Kamp (left) and partner Gene Short in their service shop. **Below:** Traffic generated by newly established record shop has developed a new type of store shopper—people who have proved excellent prospects for appliances. Free records for parties earn free announcements for store.

**B**ORN out of the war-created demand for radio repair service is Kamp & Short Radio Sales and Service, Jackson, Missouri, a venture which began as a one-man radio shop, and which in three years has advanced to a complete appliance repair and sales outfit. From cramped quarters, the new solidly entrenched enterprise moved last May into a brand new structure, 28 feet wide by 60 feet in length, which boasts virtually every modern building appurtenance.

Located on a busy highway, also the main business street of Jackson, a northeastern Missouri city of 5,000 inhabitants, the building established by Earl Kamp and Gene Short, co-partners, is a credit to the community.

Appliances are displayed in a gener-

# Kamp & Short Are

**War-born radio service firm now established, services 300 radios and appliances monthly. Record department attracts shoppers who become prospects for appliance purchases.**

by G. LOWELL

ously lighted showroom which measures 24 x 40 feet. A 40-watt strip bracket provides effective night lighting for the store. Since highway traffic is heavy, the owners feel a well-lighted nighttime store is good advertising. Window display facilities are set four feet back of the windows, and two feet above the other floor space, a plan that creates a striking display arrangement. Four-tube, 40-watt indirect lighting fixtures are utilized in lighting the sales room; walls are finished in an off-white, and the ceiling in Indian yellow.

Open displays of appliances are utilized, and customers are encouraged to serve themselves, with counters and shelves so styled as to allow the bulk of the merchandise to be arranged in a self-service fashion.

Motorcar radio repair is heavily represented in the 200-plus radios serviced monthly by the firm. The spacious drive-in facilities furnished this clientele are regarded fondly by the two owners. Service equipment is compactly ensconced in a space 24 by 20, and includes an oscilloscope, frequency modulated signal generator, vacuum tube boltmeter, capacitor analyzer, tube testers, portable testing equipment and late type refrigeration servicing apparatus.

Service specialty of the Missouri firm is radios, but numbered among the more than 300 electrical appliances repaired monthly are refrigerators, fans, toasters, sweepers, etc. An appliance parts department, valued at \$1,200, is maintained in the service shop.

It is natural that the service department is the hub of the activity of this expanding business since both partners are competent radio service technicians. Both are products of the National Radio Institute, both have tinkered with radios most of their lives. Earl Kamp, who established the business, is a natural-born radioman, with an ability to uncover the most intricate service problems. Gene Short, ex-GI, joined the business last January, was a radio

technician in the army, has a "way" with ailing sets.

Both partners are proud of their shiny new equipment, and note with satisfaction the appreciative fashion in which the patronage responds to such gestures as free tube testing, and a repair pick-up and delivery service. These features have generated more and more trade for the ever-growing service department.

Although the business development has been primarily around service, now framed is a program designed to contribute to the ultimate success of the sales branch. Earl Kamp was awarded a Crosley dealership at the outset of his venture, and is keenly interested in appliance merchandising. Both men have displayed a desire to harvest a share of the tremendous potential appliance business in evidence in the community.

Perhaps one of their most fortunate steps in this direction was the installation of a record department, which while small, has engendered a brand new type of store traffic, among which have been a host of appliance prospects. Although the three-months-old record project has been functioning with only one record franchise—Capi-

**Display windows are building-wide. Present sign on canvas is temporary.**



# Long on Servicing and Sales

tol—sales are booming with such top-drawer favorites as the King Cole Trio's "Route 66," Phil Harris' records, Freddie Slack's "House of Blue Lights," Johnny Mercer's "Personality," Stan Kenton's "Tampico," and Alvin Ray's "Cement Mixer" vanishing almost as soon as they are stocked.

One expansive counter is devoted to record displays. Self-service theory of operation is employed through the use of shelves arranged against the wall and the display counter that enables customers to help themselves. Record listening booths, wherein are placed the hits of the day, are among the numerous efficient record department appointments.

One promotional feature which has boosted record traffic is the practice of furnishing hit records free at events at the local auditorium and the high school football stadium. Only compensation Kamp & Short exact for this service is that their record department receive mention at least once during the course of an athletic event or some other community occasion.

Records, appliances, and the service department have all profited from the consistency with which the two men have pursued their advertising schedule. Two weekly newspapers serve Jackson and community, and not an issue of either paper goes to press without a Kamp & Short advertisement, publicizing either the service department, with special emphasis nowadays on the excellent auto radio repair facilities; the record department; or, if a shipment of electrical devices is received, this merchandise rates special advertising attention.

Approximately fifty percent of the firm's trade is with farm families, and the two weekly newspapers, combined with circulars and cards, are the principal means of reaching this patronage. The three-months-old record department has been allocated a generous portion of the advertising budget, inasmuch as the department is relatively new and the owners wish to be assured that record fans are informed of the stock.

A daily newspaper published in Cape Girardeau, nearby city, is also employed in the advertising campaign. This paper has a wide circulation in the county, and the two men often sponsor display ads of an institutional

nature concerning their business.

At 11:15 every morning the firm airs a radio program featuring sparkling music and commercials publicizing records and radio repair. Results from radio advertising have been good, surveys conducted by Earl Kamp reveal.

From a register maintained by retaining the name of service and sales patrons, Kamp & Short have developed a mailing list containing 1,800 names. To these customers, the two dispatch circulars, and other miscellaneous material, every two months.

"We have found it beneficial," noted Earl Kamp, "to vary our direct mail program with an assortment of material. We use broadsides on one mailing, and maybe postcards on the next. Dispatching the same type of material on every mailing is monotonous, and we find that our material is less likely to be filed in the wastepaper basket if we take the trouble to design various types of merchandising pieces."

Coming under the heading of "Effective Advertising," are the large-lettered signs on the sides of the pick-up trucks which ply the streets of Jackson, and which Earl Kamp credits with playing a vital role in implanting the name of the store in the minds of local residents. These plainly-lettered signs proclaim the name of the store and telephone number, list major electrical products the firm sells, and also publicize the repair service.

Refrigerators and washers head the list of appliances in demand by store customers. It is a middle class community, composed of factory workers and farmers of average means, and the number of homeowners is above average. It is natural that the majority of the residents are home-improvement-conscious and will be ready purchasers of devices designed to ease the drudgery of housework.

No flash-in-the-pan outfit, Kamp & Short is one war-born radio repair firm here to stay. The pair is now prepared to launch into a merchandising program that will promote even greater benefits for the service department and the sales branch. In the attractively styled new building, with an aggressive promotional schedule that undergoes almost daily improvisations, and a new line of traffic-producing merchandise—records—the outlook here is promising indeed.



**Above:** Bosses Kamp & Short in executive session, planning campaign to sell appliances. **Below:** Refrigerator repair is specialty of this serviceman; over 300 appliances serviced monthly, plus auto radio.



**Below:** (l. to r.) Bendix radio general sales manager L.C. Truesdell; W.P. Hilliard, general manager, E. K. Foster, production manager, with new set.



## MERCHANDISE PRE-VIEWS—18



Table model, direct-view 7 inch tube, (RCA-Victor). Both models ready in November.



Table model,  $6\frac{3}{8} \times 8\frac{1}{2}$  inch image, (RCA-Victor) on 10" direct viewing tube.

### Television Receivers Here

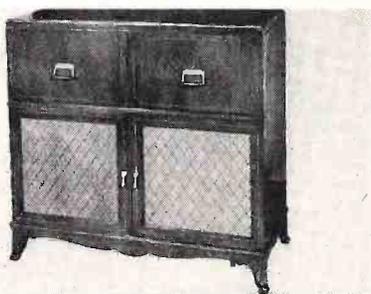
RCA Victor is showing initial post-war television home receivers to the company's television set distributors. Limited quantities of two of the newly designed sight and sound models shown are planned for delivery to dealers' stores for sale to the public early in November, according to Joseph B. Elliott, vice president in charge of RCA Victor Home Instruments. Prices: 621-TS, 7-inch picture, \$225. 630TS, 10-inch picture \$350. Two console models, one a large-screen projection type receiver which provides a picture almost the size of a standard newspaper page and incorporates FM (frequency modulation) as well as standard broadcast reception. Price: \$1200. The other includes 11 tube AM-FM radio reception and automatic record player. Price: 641TV, \$750.

To assure satisfactory customer de-

monstrations in dealer stores, a program of antenna installations in these stores by the company's factory service engineers is now underway. A similar program to provide the most efficient operating performance of each RCA Victor television receiver is also planned for the public.

Factory service engineers will install each receiver sold and provide antenna, antenna installation, instruction in operation of the set, and a year's service and complete maintenance of the receiver at a reasonable all-inclusive charge.

Meetings will be conducted by RCA Victor distributors for their dealers in areas presently served by television programs. Similar meetings will be held in other cities as new television stations provide ample program service.



### Six Crosley Models

1. Carrollton radio-phono combination, Model 146CS. 11 radio tubes, 1 rectifier 1 phase inverter, 1 tuning indicator. 18 watts output; 12" PM speaker; 4 bands, including FM; 117-volt AC operation improved signal web enclosed loop antenna. Automatic record changer; 6-position automatic electric push button station selection on standard band. Mahogany cabinet; built-in dipole FM antenna.



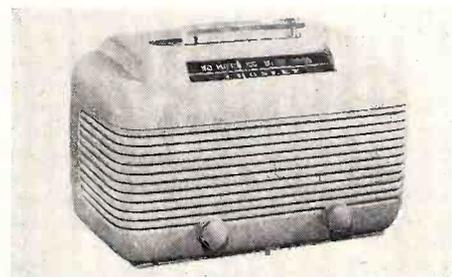
2. Debutante radio-phono combination, Model 86CS. 7 radio tubes, 1 rectifier. 6 watts power output; 10" PM speaker; 3 bands, including FM; 117-volt AC operation; slide rule dial; enclosed loop antenna. Automatic record changer; 4 album compartments; 8 matching albums for 48 12" and 48 10" records. Continuous tone control with automatic bass compensation. Mahogany or walnut.



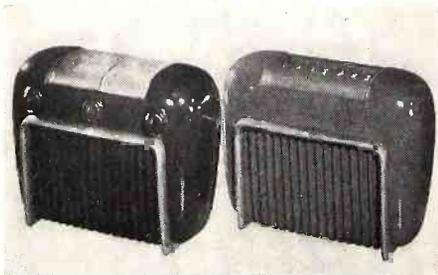
3. Por-Table radio, Model 56PA. Plays 3 ways: AC-DC or battery operation. 140 hours battery life. 4 radio tubes, one rectifier. 4" speaker. Plastic case. Enclosed loop antenna; carrying handle.



4. Minuette table model 56TJ; 4 radio tubes, 1 rectifier; 540-1600 KC; AC-DC. PM speaker, beam power output; automatic control. Slide rule dial; enclosed loop antenna. Walnut cabinet.



5. Minuette table model 56TH; 4 radio tubes, 1 rectifier; 540-1600 KC; AC-DC. PM speaker, beam power output; slide rule dial, loop antenna; retractable carrying handle. Ivory plastic case.



6. Duette end-table models 56TD, 56TE, 56TF (mahogany, tan & blue plastic cabinets). 4 radio tubes, 1 rectifier; 540-1600 KC, AC-DC. 4" PM speaker; loop antenna; slide rule dial; beam power output; back & front alike, gold trim.



### Promote Radio Rectifier

A new miniature selenium rectifier to function as does the rectifier tube in AC-DC portable, table and console home radios, is being given a comprehensive sales promotion program just announced by Norman E. Wunderlich, executive sales director, Federal Telephone and Radio Corp., Newark, N. J. The program has a triple appeal, being pointed to the dealer, the radio service man and to the consumer. For the two former, it plays up the profit and prestige angles; for the set owner it puts emphasis on the better radio performance resulting from the use of the rectifier. The sale and installation of Federal's selenium rectifier open up to dealers and repair men an attractive source of extra profit.

The rectifier is a five-plate, metal unit, measuring only  $1\frac{1}{4}$ " x  $1\frac{5}{32}$ " x  $\frac{5}{8}$ ". It is unbreakable, starts the set instantly, runs cool, delivers greater output voltage, increases sensitivity of the receiver, boosts performance to a new high and lasts the lifetime of the set. It is easily and quickly installed.

The consumer market potential for Federal's selenium rectifier runs into the millions. Most of the 25,000,000 home radio sets in use up to the first of this year are prospects for installation, as well as the approximately 6,000,000 sets produced thus far in 1946.

### DEMAND IS FOR GOOD TABLE MODELS

The current alarm over the "backing up" of radio table models, which has had quite a bit of discussion in the trade, is pretty much just talk, according to Nate Hast, merchandising manager of the home radio division of Lear, Incorporated. The only backing up on table models is in lines which would never have sold in the first place, except for the extreme scarcity of goods which, in the early stages, made it possible to sell anything.

"When people report that buyers are becoming more selective; that buyers are only looking for the better-known names, and not picking up anything, they are not saying the whole truth," commented Mr. Hast. "What they should say is that buyers are steering clear of the many monstrosities which had been foisted on the public, and which the public will not buy since it's had a look at the better, beautiful, more stylish and better-performing sets that are being produced. It just happens that the unknown brands, the 'quickies', did not have good design or good performance, therefore they do not sell.

Another fact that Mr. Hast pointed out is that this "backing up" is reported mainly in metropolitan centers. Rural sections are still in need of table models, and distributors continue to ask for more and more radios that have sound design and can offer good performance.

Sales of the rectifier are so promising, organizations with national distributive setups are interested in it. Sylvania, for instance, has an agreement with Federal whereby the miniature selenium rectifier will be sold through its country-wide organization of more than 200 outlets.

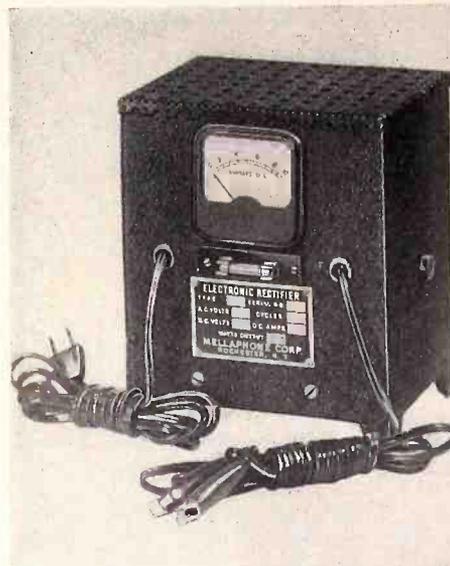
All of this indicates the potential for the repair man. It is estimated that the individual service man handles an average of ten sets daily. He can count on \$1 to \$2 clear profit per set—\$60 to \$100 weekly—through installing the rectifier. This profit is over and above the profit made from routine servicing of sets. A check on radio repair shops indicates that the new rectifier can be applied to two-thirds of all sets brought in for servicing. Since the repair man, in working on the radio, must remove the chassis from the cabinet, he can at the same time make the simple wire connections for installing the rectifier. The suggested selling price of the rectifier to the consumer is \$1.60 plus installation charge.

The radio service dealer price range is based on quantity ordered. For one to four standard packages of 12 type 403D2625, 100 milliamperes, rectifiers, the price is \$12 per package; eight packages sell for a lot price of \$89.28, and twelve packages for a lot price of \$129.60. There are discounts for jobbers.

### Battery Chargers

Mellaphone Corp. manufactures selenium plate battery chargers for 6 and 12 volt storage batteries. The chargers are handy in a radio repair shop. They will charge radio auto-batteries; they serve as battery eliminators on dealer display tables, supply D.C. for car radios. Typical data:

Charger comes complete with cords, clips and plug, ready to use. Operates

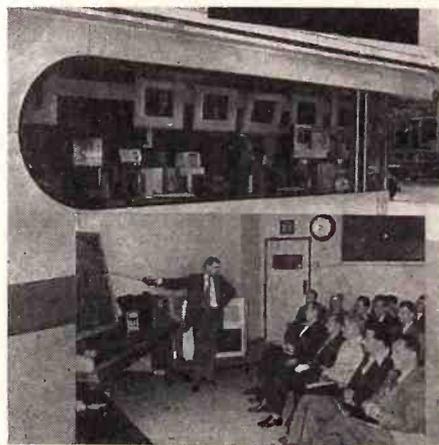


Mellaphone Rectifier

on 110 volts, 50/60 cycle A.C. power. Models will also be available for 220 volts 50/60 cycle power. Rated at 8 amperes—delivers an in dial charge of from 10 to 12 amperes on a discharged battery and automatically tapers to approximately 4 amperes at full charge. Will withstand an overload of 50% without harm. Ammeter on face of charger indicates rate of charge and insures proper connection to battery. Charger is connected easily to battery or to ammeter terminals of automobile, tractor, or motorboat. Protected against shorted or faulty batteries by conveniently located fuse. Uses Selenium rectifying plates which assure high efficiency and never require replacing. No moving parts, noiseless. Fully guaranteed. Firm address, Rochester 2, N. Y.

### Public Address Systems Win Wide Acceptance

Every day new uses for public address  
(See page 42)



THE COVER: Radio servicemen are given familiarization course in television installation and maintenance by William Burlingame, chief service engineer, Allen B. Dumont Labs., Inc.

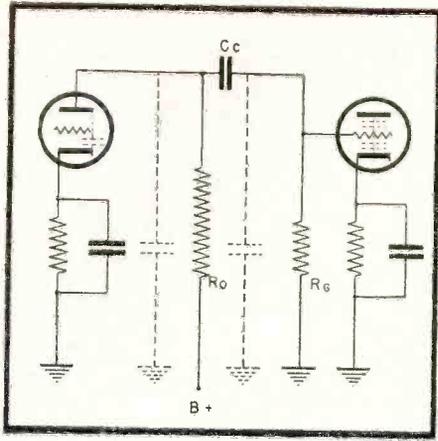


Figure 1.

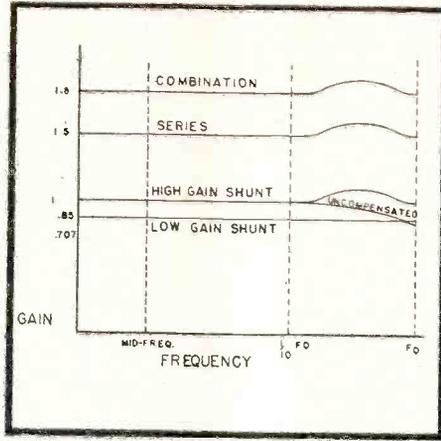


Figure 2.

transformer coupling for a great number of reasons, including better frequency response and economy.

At mid-frequencies, the plate load which is  $R_o$  as shown in Fig. 1 has a resistive value of 2000 ohms, and in shunt with it are the various capacities ( $C_t$ ) which include the stray capacities of the wire and the inter-electrode capacities in the output and input tubes. If these capacities amounted to 40 micromicro farads, then the capacitive reactance at 200 KC would be 20,000 ohms, therefore the resistance across  $R_o$ - $C_t$  would still

## How Video Amplification Works

**Complete explanation of frequency response of video amplifiers. Helps clarify relations of frequencies and shows how to get clearer and better images when aligning receivers.**

**T**ILL the advent of television circuits, the radio and electronic engineers, designers, and technicians had only to contend with amplification of audio frequencies. Since these frequencies range from 20 cycles to 15,000 cycles, there were few problems involved, because the average amplifier tube available could readily give a flat response to either all or nearly all of these frequencies.

Video signals present a much more complex problem, inasmuch as they range from 30 Cps to  $4\frac{1}{2}$  Mc.\* in the best black and white transmission, and undoubtedly will range much higher in color television.

Here then we have two problems. The first is to obtain a flat response, or uniform gain from the mid-frequencies to the highest desired video

frequency, and the second is to obtain a flat response or uniform gain from the lowest desired frequency to the mid-frequencies.

In order to solve the first problem, it is necessary for us to understand the cause of a fall in response at high frequencies. The formula for capacitive reactance ( $X_c = \frac{1}{2\pi FC}$ ) shows that the reactance of a condenser is inversely proportional to the frequency, or as the frequency goes up, the reactance goes down.

In coupling two video amplifiers, resistance coupling is used instead of

*\*P.S.—This figure does not represent the station transmitting frequencies. It is the frequencies that actually appear on the video amplifier of the receiver.*

be approximately 2,000 ohms.

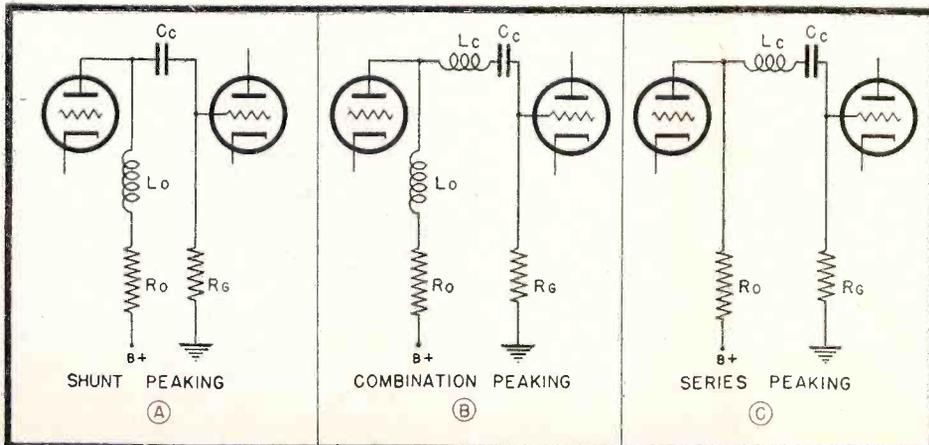
As the frequency goes up, the capacitive reactance goes down so that eventually, we reach a frequency where the capacitive reactance is equal to the plate load. This frequency is called  $F_o$ . Here the gain of the amplifier is down to 70.7% of the mid-freq. gain, or down 3 Db. If this frequency were  $4\frac{1}{2}$  Mc., we would have to compensate the circuit so that the response would be flat to this point instead of down. The method used is called peaking, and the three most common methods of peaking are shunt peaking, series peaking and combination peaking. The results of frequency runs with these peaking coils are shown in Fig. 2.

### Shunt Peaking

The simplest and quite often used method of compensation. Here a coil is placed in series with the plate load so that the inductive reactance there will counteract the capacitive reactance. There are two different values of coil which might be inserted in shunt depending upon whether high gain shunt or low gain shunt methods are used. The response of the low gain shunt method is 15% lower than the high gain shunt response, but is very flat up to  $F_o$  and beyond, whereas in the high gain shunt method, there is a slight hump in the response curve just before  $F_o$  is reached. For low gain, the coil inserted in series with

(See page 34)

Figure 3.



# SERVICE DATA

for

## ADMIRAL, CHASSIS 5B1A

### PHONO-RADIO

#### ALIGNMENT PROCEDURE

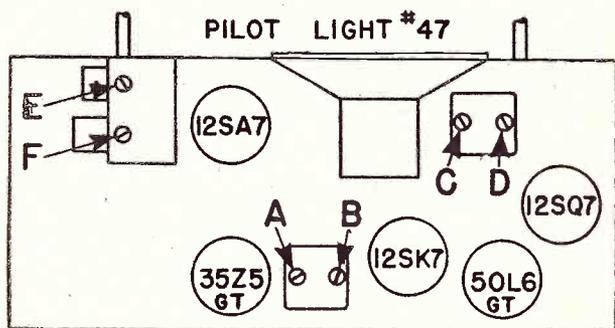
1. Be sure Radio Receiver and Signal Generator are thoroughly warmed up before starting alignment procedure.
2. Check setting of Pointer Extremes and note correct 600 K.C. and 1400 K.C. positions on Dial Background. (See Dial Diagram below.)
3. Connect Output Meter across Voice Coil.
4. Turn Receiver Volume Control—full on.
5. Use lowest Output setting of Signal Generator capable of producing adequate Output Meter indication and then proceed in the following sequence.
6. Repeat adjustments to insure good results.

Connect Signal Generator to—	Dummy Antenna Between Radio and Generator	Set Generator Frequency to—	Set Receiver Dial Frequency to—	Adjust Following Trimmers	Type of Adjustment
Tuning Condenser Antenna Stator	250 mmfd. Condenser	455 K.C.	High frequency end of Dial	C—D 2nd I. F. A—B 1st I. F.	Adjust to maximum Output
Tuning Condenser Antenna Stator	250 mmfd. Condenser	1630 K.C.	High frequency end of Dial	E—Osc.	Adjust to maximum Output
Loop radiator (or place pickup lead from gen. close to loop of set to obtain adequate signal).	No actual connection between set and generator.	1400 K.C.	Tune in generator signal	F—Ant. (See Note)	Adjust to maximum Output

NOTE: Antenna trimmer "F" must be aligned after chassis and loop are mounted in the cabinet. This adjustment can be made by lifting up the top cover and removing the plug button which is directly above trimmer "F."

#### TOP VIEW

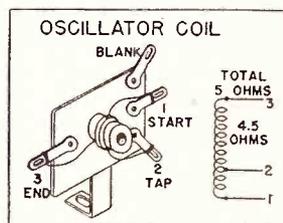
#### TUBE & TRIMMER LOCATION



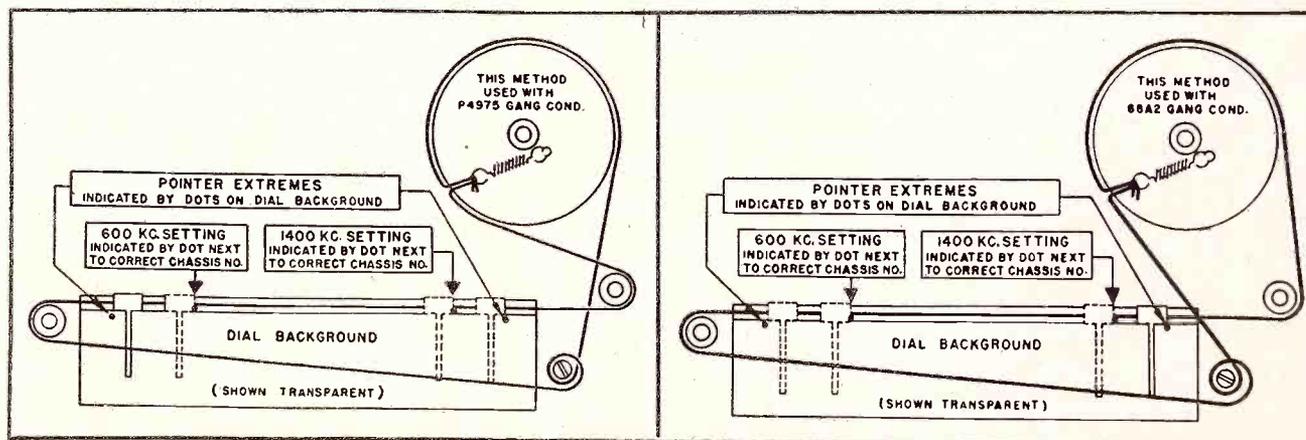
BACK OF CHASSIS

#### RECORD CHANGER SERVICE DATA

Complete service information and parts lists for record changers are contained in separate manuals. Check record changer for model number. Reference should then be made to the proper manual for all record changer service information.

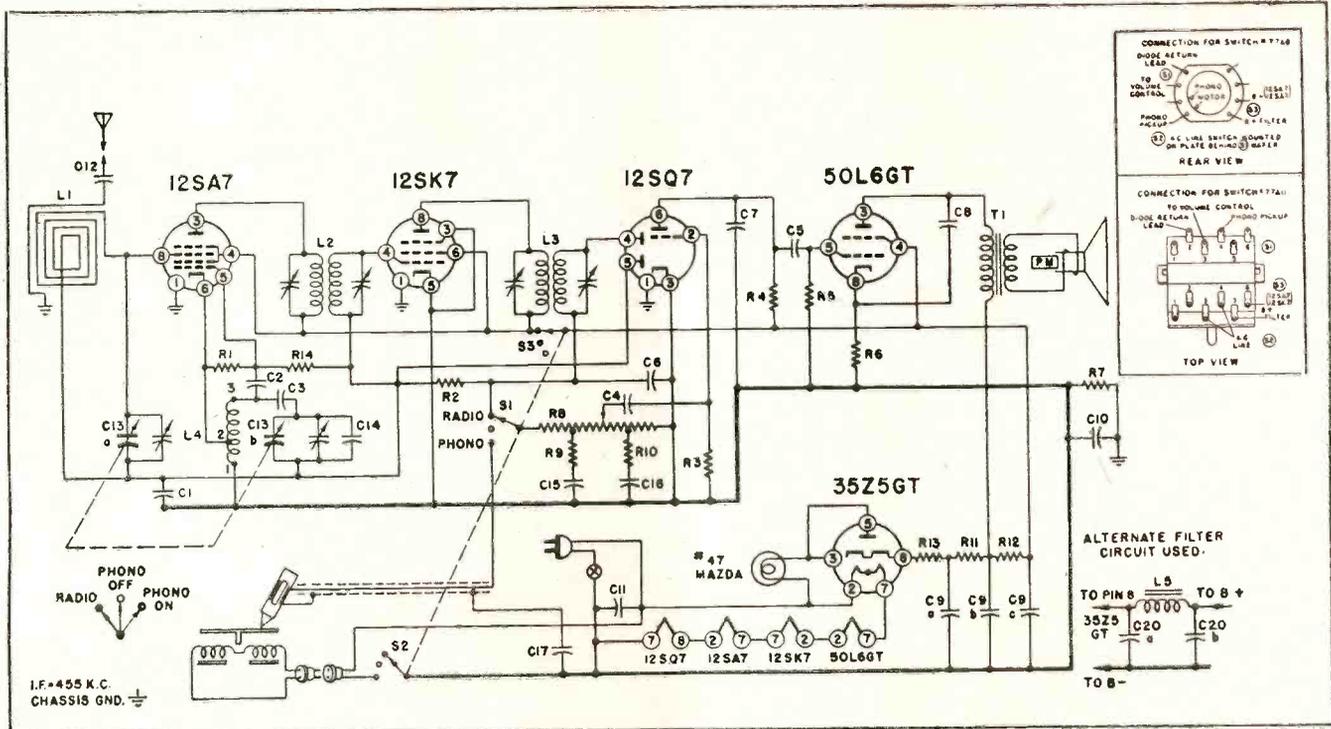


#### POINTER SETTINGS AND DIAL CORD STRINGING

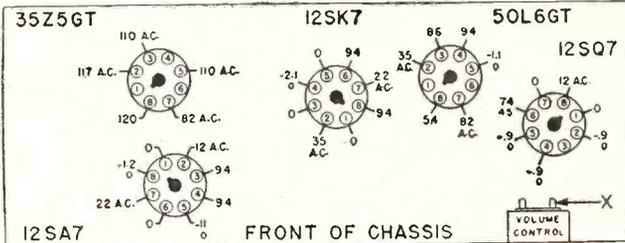


(Continued)

## SERVICE DATA ADMIRAL, 5B1A-PHONO



### VOLTAGE DATA



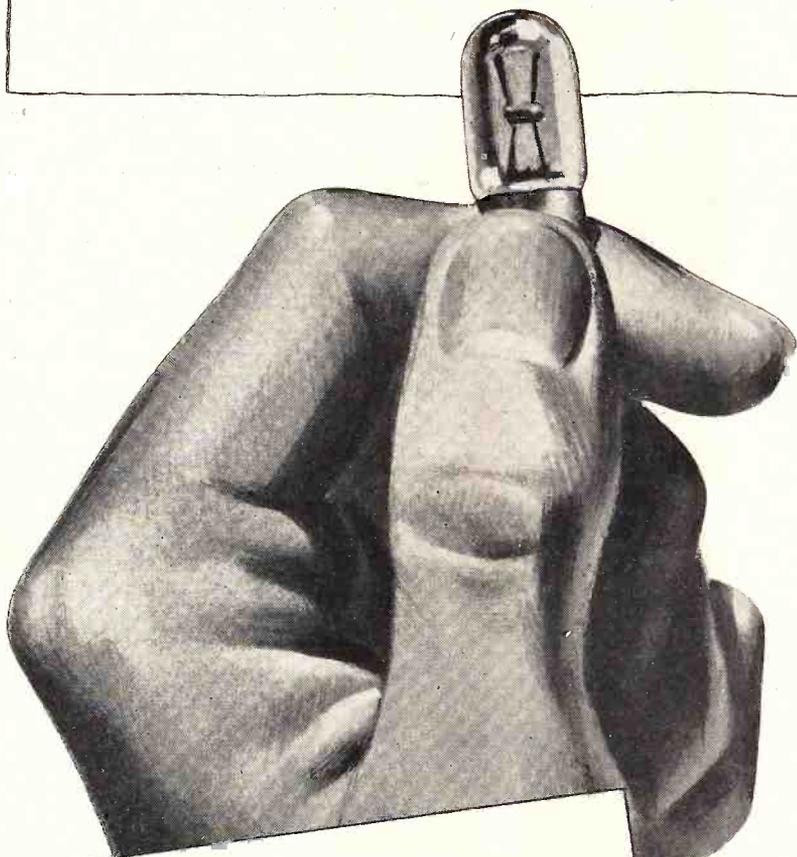
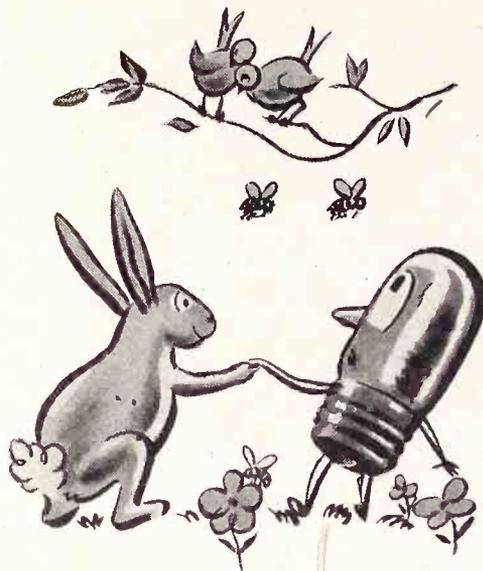
Bottom View of Chassis, Showing Voltages

- All readings made between Tube Socket Terminals and Switch Lug on volume control (Point "X" on drawing).
- Measured on a 117 Volt A.C. line.
- Volume control full on.
- Dial tuned to low frequency end, no signal.
- Voltage obtained on Vacuum Tube voltmeter.
- A second voltage reading is shown made with a 1000 ohm-per-volt meter when use of this instrument would result in appreciably lower readings.

### REPLACEMENT PARTS

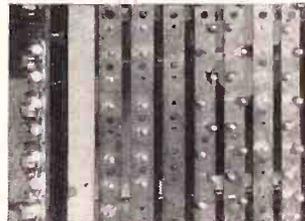
CONDENSERS			RESISTORS			MISCELLANEOUS		
Symbol	Description	Part Number	Symbol	Description	Part Number	Description	Part Number	
C1	.1 mfd., 200 Volts	64B1-30	R8	1/2 Megohm, Volume Control and Switch. Tapped at approximately 100,000 and 200,000 ohms from start.	75B3-2	Background, Dial.....	22B7-1	
C2	50 mmfd., Mica	65B7-11	R9	47,000 Ohms, 1/2 Watt	60B8-473	Buttons, Snap (Dial).....	13A1-3-2	
C3	.02 mfd., 400 Volts	64B1-24	R10	27,000 Ohms, 1/2 Watt	60B8-273	Cabinet Body less cover (6RT41A Mahogany).....	34D2-11	
C4	.01 mfd., 400 Volts	65A3-10	R11	150 Ohms, 1 Watt	60B28-1	Cabinet Cover (6RT41A Mahogany).....	34D2-10	
C5	.01 mfd., 400 Volts	65A3-10	R12	1,000 Ohms, 1 Watt	60B28-2	Cover Support.....	37A7-1	
C6	250 mmfd., Mica	65B7-27	R13	33 Ohms, 1 Watt	60B28-3	Dial Scale.....	21B4-1	
C7	500 mmfd., Mica	64B1-24	R14	10 Meg., 1/2 Watt	60B9-106	Drum and Hub Assembly.....	A1012	
C8	.02 mfd., 400 Volts					Grommet, Rubber Insulating.....	12A1-1	
C9a	30 mfd., 150 V.	Electrolytic 67A8	<b>TRANSFORMERS and COILS</b>			Grommet, Rubber for Drum.....	12A1-2	
C9b	30 mfd., 150 V.		L1	Antenna, Loop	69B6	Knob, Tuning, Volume Control.....	33A1-2	
C9c	20 mfd., 150 V.		L2	Transformer, 1st I. F.	72B3	Knob, Radio-Phono Switch.....	33A11-5	
C10	.1 mfd., 400 Volts	64B1-20	L3	Transformer, 2nd I. F.	72B4	Pilot Light No. 47.....	81A1-8	
C11	.05 mfd., 400 Volts	64B1-22	L4	Oscillator, Coil	69A5	Pilot Light Socket and Leads.....	82A2-1	
C12	.005 mfd., 600 Volts	64B1-12	L5	Choke Coil (Filter)	74A1	Plug, Button.....	13A2-1-57	
C13a	.00042 mfd., Gang	68A2 or P4975	T1	Transformer, Output	98A4	Plug, Alden (Motor Leads).....	88A8-1	
C13b	.00018 mfd., Gang		<b>PHONOGRAPH PARTS</b>			Pointer.....	25A1-2	
C14	15 mmfd., Mica	65B5-3	See Record Changer Service Manual for Detailed Parts List.			Pulley, Fibre Dial.....	17A1-3	
C15	.01 mfd., 400 Volts	65A3-10	Description	Part Number	Shaft, Tuning.....	28A1-1		
C16	.01 mfd., 400 Volts	65A3-10	Centerpost.....	G400A12	Socket and Leads (Alden).....	89A6-2		
C17	.05 mfd., 400 Volts	64B1-22	Crystal Cartridge.....	409A1	Socket, Octal Tube.....	87A5-1		
C20a	30 mfd., 150 V.	Electrolytic 67A3	Idle Wheel (407B3 Motor).....	G400A23	Speaker, 5" PM & Output Transformer.....	78B13-1		
C20b	50 mfd., 150 V.		R1	22,000 Ohms, 1/2 Watt	60B8-223	Spring, Dial Cord Tension.....	19B1-7	
			R2	1 Megohm, 1/2 Watt	60B8-105	Switch Rotary Radio-Phono.....	77A8	
			R3	10 Megohm, 1/2 Watt	60B8-106	Transformer, Output.....	98A4	
			R4	220,000 Ohms, 1/2 Watt	60B8-224	Washer, Flat Insulating.....	5A1-6	
			R5	470,000 Ohms, 1/2 Watt	60B8-474	Washer, Offset Insulating.....	5A2-5	
			R6	150 Ohms, 1/2 Watt	60B8-151	Washer, Spring.....	4A6-3 U	
			R7	150,000 Ohms, 1/2 Watt	60B8-154			

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# CIRCUIT COURT

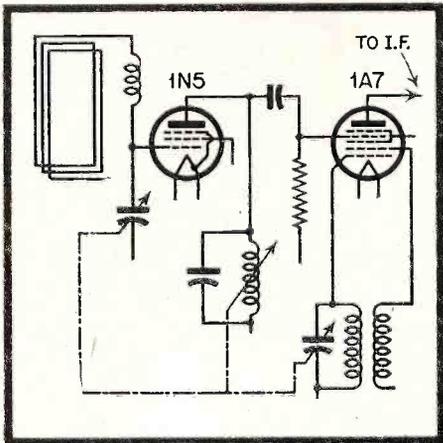


Fig. 1. Admiral 6E1.

## Capacity and Inductance Tuning (Fig. 1).

It is not uncommon to find a combination of capacity and inductance tuning in today's receivers. One example of this method is shown in Fig. 1 which indicates the essential parts of the Admiral 6E1-6E1N chassis. The loop is tuned by one section of the two gang condenser; the oscillator portion of the 1A7 converter by the other gang section. The intermediate circuit between the 1N5 RF tube and the mixer is tuned by a metal slug which moves in and out of the coil as the gang is rotated.

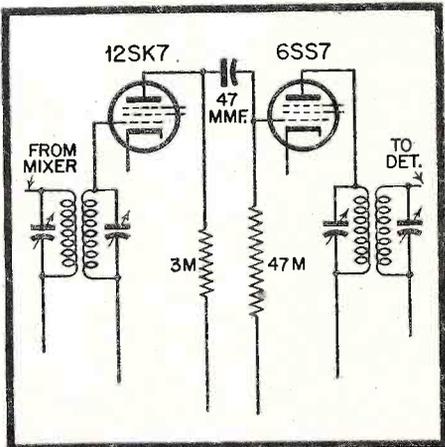


Fig. 2. Truetone.

## Transformer and R-C Coupling (Fig. 2)

The use of a combination of transformer and R-C coupling in an I.F. system is illustrated in Fig. 2. This particular circuit is of the Truetone D2624. The over-all gain will be greater than a single stage with similar transformers, but far less than if an inter-stage transformer were used between the stages. It will be noted that both 12 and 6 volt tubes appear in the set, in addition to the 35 volt output and rectifier tubes. All have the same heater current so voltage drops take care of themselves.

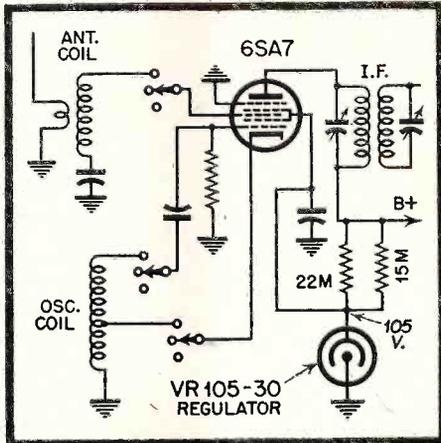


Fig. 3. Majestic 4809.

## Voltage Regulator Tube (Fig. 3)

The use of a voltage regulator tube is common practice in commercial and military receivers to gain increased oscillator stability, but its inclusion in a broadcast set deserves mention. The new Majestic chassis 4809 uses a VR-105-30 tube to maintain the screen and oscillator plate of the 6SA7 converter at 105 volts in spite of line voltage variations or other tendency to vary. Short wave reception should be unusually stable.

Note the parallel 15M and 22M ohm resistors which drop the plate voltage to 105 volts for application to the screen (Fig. 3). It has been shown that a variation in the screen voltage may change the frequency of the locally generated oscillator voltage in this type of circuit. The use of a voltage regulator should overcome this condition.

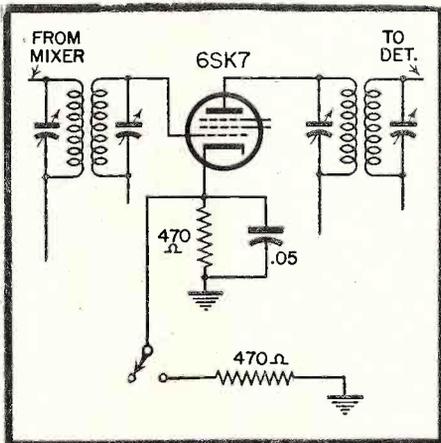


Fig. 4. Garod 6DPS.

## Single I.F. Stage (Fig. 4)

It is frequently advisable to hold down the sensitivity of broadcast band receivers in these days of strong nearby stations, but when receiving short wave stations it is advantageous to use the maximum sensitivity of which the set is capable.

The Garod Model 6DPS has provis-

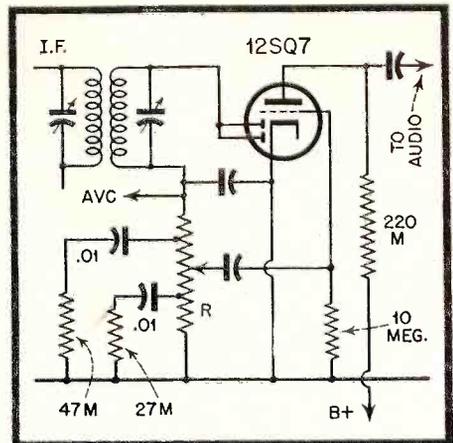


Fig. 5. Admiral 5B1.

ion for this desirable feature. Fig. 4 shows the elements of the single I.F. stage. On broadcast, a 470 ohm cathode resistor provides bias to the 6SK7 tube; one bank of the band switch shunts another 470 ohms across the first one when the set is switched to short wave. This cuts the bias in half and raises the gain of the stage considerably. Weak stations can then be tuned in better. On the broadcast band where signals are generally strong this sensitivity would tend to make the receiver unduly noisy and possibly cause overloading, with attendant distortion on locals.

## Tone Compensation (Fig. 5)

While many of the simpler receivers do not employ any form of tone compensation, it will be found in most combination phonoradio instruments. The Admiral 5B1 is a good example of the usual type employing this feature. Shown in Fig. 5 are the essential elements. The 500M ohm volume control is tapped at 100M and 200M from the low end and bass boosting elements added. As the arm moves down the control, the lows tend to drop off faster than the highs, and the added R-C circuits compensate for the change.

Note that the capacitors are the same value at both compensating tops but that the series resistor decreases in value as additional compensation is required. A less complicated and less expensive method is sometimes used in which only one tap is provided.

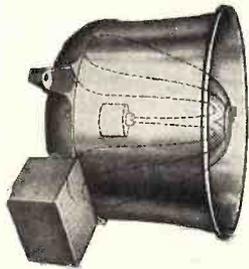
## Battery Terminal Voltage (Fig. 6)

Longer tube life and better economy of battery expense are possible in dry-cell operated receivers if provision is made to compensate for the normal decrease in terminal voltage. This is particularly true of the A battery circuit. Shown in Fig. 6 is the method used in the Admiral 4A1 form set. The switch SW is opened (See page 35)



# RACON

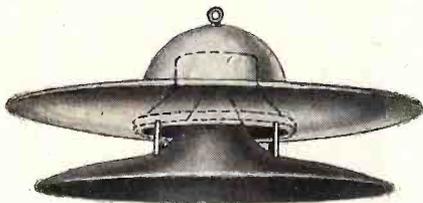
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# RACON

## RACON ELECTRIC CO.

52 EAST 19th ST. NEW YORK, N. Y.

## HOW VIDEO AMPLIFICATION WORKS

(From page 28)

TYPE	$R_0$	$X_{L0}$	$X_{LC}$	RELATIVE GAIN AT $F_0$
UNCOMPENSATED	$X_{CT}$			.707
LOW GAIN SHUNT	.85 $X_{CT}$	.3 $X_{CT}$		.85
HIGH GAIN SHUNT	$X_{CT}$	.5 $X_{CT}$		1
SERIES	1.5 $X_{CT}$		.67 $X_{CT}$	1.5
COMBINATION	1.8 $X_{CT}$	.12 $X_{CT}$	.52 $X_{CT}$	1.8

Table 1

the plate load has an inductive reactance which equals 30% of the Capacitive Reactance of the shunt capacities at  $F_0$ , so that now  $R_0$  is equal to 85% of the shunt capacitive reactance. For high gain shunt, the coil has an inductive reactance equal to 50% of the shunt capacities reactance. Here  $R_0$  has the same impedance as  $X_{CT}$ .

### Series Peaking

For series peaking, a coil is inserted in series with the coupling condenser.

Here the gain will be 50% greater than for the high gain shunt method. The value of this series coil should be 67% of the shunt capacitive reactance at  $F_0$ , so that now  $R_0$  is equal to one and a half times the shunt capacitive reactance at  $F_0$ .

### Combination Peaking

The combination peaking method entails putting in two coils, one in series with the plate load ( $L_0$ ) and the other in series with the coupling condenser

( $L_c$ ). The value of the coil in series with the plate load should be such that it's reactance equals 12% of the shunt reactance, and the value of the coil in series with the coupling condenser should be such that it's reactance equals 52% of the shunt reactance both at  $F_0$ . The various methods of coil insertion are shown in Fig. 3, and the values used together with the gain is shown in Table 1.

In all video amplifiers pentode tubes are used so that the interelectrode capacitances are small, therefore the capacitive reactance which shunts the plate load is high. A value of about 40 micromicro farads might be so obtained for the total shunt capacities.

The problem of gain for low frequencies must also be considered, because at low frequencies the capacitive reactance of the coupling condenser is high enough so that there is a voltage drop across it. Since the signal for the input tube is taken across the grid resistor ( $R_g$ ), at high frequencies the coupling condenser acts like a short circuit, and all of the signal voltage is developed across the grid resistor, whereas at low frequencies, there is a voltage divider action inasmuch as some of the signal voltage is developed across the coupling condenser and the rest of it is developed across the grid resistor. This is compensated for by an R-C filter in the plate load circuit which causes an increased signal output to be delivered to the input tube.

There is a certain low frequency

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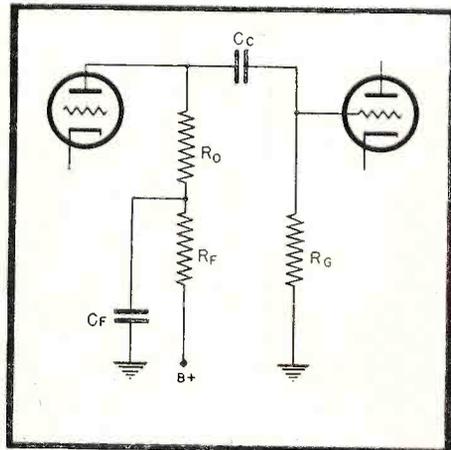


Figure 4.

where the capacitive reactance of the coupling condenser is equal to the resistance of the grid resistor. Here again the gain is down to 70.7% of maximum. With a filter circuit inserted, there would be a voltage drop across the coupling condenser and also a drop across the grid resistor which would still be equal in response to the gain at mid-frequencies.

The way this filter is inserted in the circuit is shown in Fig. 4, and the values used are such that the time constant

(See page 37)

## CIRCUIT COURT

(From page 32)

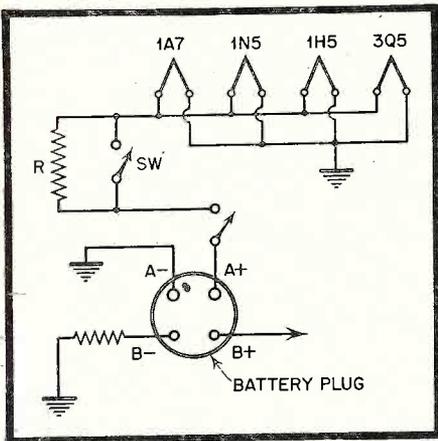


Fig. 6. Admiral 4A1.

when a new battery is installed. This places R (.75 ohm) in the filament circuit and limits the voltage to a safe value. Later the switch is closed to compensate for the decrease in voltage with age. Results will remain substantially uniform over a longer period, and tube life will increase materially compared to operation without the compensating feature.

## MEN IN THE NEWS

(From page 41)



Dr. Norman C. Beese.

### TALKING LAMP

Secret, two-way conversation over an invisible light beam is made possible by a caesium vapor lamp developed by the Westinghouse Lamp Division, Bloomfield, N. J. Dr. Norman C. Beese, research engineer who designed the infrared lamp, shows how "beamcasting" operates. The scientist's voice, fed into the lamp from the microphone, is amplified by the generator in background. In inter-ship or ship-to-shore service, the voice waves are transmitted over a carrier wave having 350 million times

the frequency of normal radio broadcasting bands. At the receiving station, a photoelectric cell picks up the rays and converts them into a reproduction of the spoken word. In confidential service, the caesium lamp utilizes a filter cover which blocks out all stray visible light.

### TALKING MIKE

Vice-president and general manager Robert J. Cannon (with Miss Leorlei Fleming) of Cannon Electric Development Co. examine microphone plug and its adapter for a Universal "D20A" mike. Directly in front of Mr. Cannon is American Microphone's "D5" Dynamic with HB3 floor stand. Mr. Cannon's father who still retains an active role in the presidency of the concern, designed



R. J. Cannon (left)

and built the first microphone plugs for the pioneer "talking" pictures.

(See page 41)

Masco MA-50 Amplifier 50 Watts of Truly rated power output for big PA systems

Masco Record Changer-Top Amplifier Improved and Modernized

Masco De Luxe Phono-Top PA Equipment

Masco RC-1 Portable Automatic Record Changer For twelve 10" or ten 12" records

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**MASCO SOUND EQUIPMENT**  
 reprinted from our recent ads

Masco Intercommunication Equipment Master-to-Remote and Master-to-Master 6 and 12 position

Masco MPA-3 All Electric Phonograph Reproducer

Masco MAP-15 True-Tonal Musical Instrument Amplifying System

Masco De Luxe High-Fidelity Amplifier For Records, FM and Television

**MARK SIMPSON MANUFACTURING CO., Inc.**  
 32-28 49th Street, Long Island City 3, N.Y.

**SOUND SYSTEMS and Accessories**

Ravenswood 8-5810-1-2-3-4

# Shop Notes

## METER REPAIRS

Repairing meters requires a steady hand and common sense. In general, meter troubles can be classified under the following categories:

1. Inoperative.
2. Inaccurate.
3. Pointer sticks (friction).
4. Meter balance needs adjustment.

Under item (1) the trouble might be traced to an open multiplier, meter hair-spring or armature. Exact replace-

ment parts should be used. These may be obtained from the manufacturer.

When replacing hair springs or armatures, the following tools are necessary:

- a. Small soldering copper heated by alcohol flame.
- b. Light-tensioned tweezers.
- c. Watchmaker's screw-drivers and pliers.
- d. Watchmaker's eye-piece.

Ordinary electric soldering irons

should not be used due to their excessive heat. Application of this heat to the hair springs will destroy their temper.

If the meter magnet has to be removed, a keeper, or bar of steel should be placed across its ends.

Under item (2), inaccurate meter readings may be traced to defective shunts or multipliers. If the meter magnet has been dropped, or has been left lying around without a keeper, it will lose some of its magnetism and the overall accuracy of the meter will be affected. Re magnetization should be done by the manufacturer, unless instruments are available to check the calibration of the remagnetized unit.

Item (3), commonly referred to as meter friction, is usually caused by small iron or dust particles which have found their way into the space between the armature and the pole pieces. Blowing gently on the exposed movement, and observing any eccentric action of the pointer, will reveal this condition. These particles are easily removed with a fine needle.

Other reasons for friction are; rubbing of the dial pointer against the meter scale, tight adjustment of the set screws controlling the jewel bearing pressure on the pivots, cracked jewels, and defective hair-springs.

Meter balance (item 4), can be checked by holding up the meter in various planes, and observing the effect on the relative position between the pointer and zero on the scale. A well balanced pointer should remain at zero in any plane. Balance adjustments are made for each plane by shifting or changing the weights on the balance arms.

If the jewel bearings are adjusted too loosely the movement will rest sloppily between the pivots and perfect balance will be impossible to obtain. This condition can easily be checked by moving the armature gently with the tweezers.

## ZENITH MODEL 7S585— INOPERATIVE

Sounds alive—but no reception. Open contact on band switch. Examine each pair of contacts carefully. Clean with carbon tetrachloride.

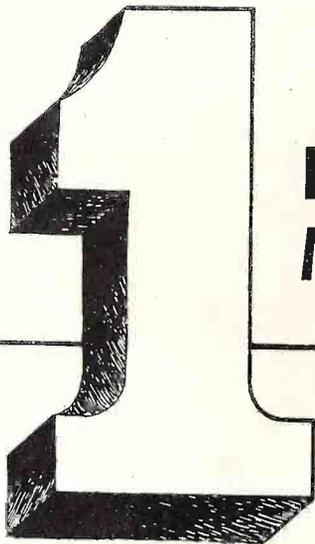
## R.C.A. QBZ—REACTIVATING RECTIFIER

To reactive the rectifier short (A+) and (A-) terminal of socket for four minutes. Heat developed will restore discs to normal.

## G.E. MODEL 250—TESTING CHARGING RATE.

Insert 2-ampere ammeter in series with battery. Charging rate should be  
(See page 39)

There's only



RIDER  
MANUAL

BUT IT'S IN FOURTEEN VOLUMES

Rider Manuals are the only single source upon which you can depend for authoritative servicing data on pre-war American made receivers.

Rider Manuals cover the things which our 16 years of specialized publishing have proved you want and need; supplying such vital material as receiver schematics, voltage data, resistance values, chassis layouts and wiring, and trimmer connections.

Further evidence of our continuing service to the servicing industry will be found in the forthcoming Volume XV. This new volume will contain specially prepared and highly refined servicing information available from no other source—not even from the set manufacturer. This supplementary material is information you need, offered in a form that will make it most useful to you. It will result in the saving of servicing time—an increase in production worth many times the price of the volume!

Our advertisement next month will announce Volume XV and give important details on the revolutionary and exclusive features it will contain.

With Volume XV as with the other fourteen volumes "You're right with a Rider Manual!"

### RIDER MANUALS



You Need All 14 Volumes

Volumes XIV to VII..each volume	\$15.00
Volume VI .....	11.00
Abridged Manuals I to V.(1 vol.)	17.50
Record Changers and Recorders..	9.00

**JOHN F. RIDER PUBLISHER, INC.**  
404 FOURTH AVENUE, NEW YORK 16, N. Y.

Export Division: Rocke-International Corp. 13 E. 40th Street New York City Cable: ARLAB

## Video Amplification

(From page 34)

of the load resistor and the filter condenser is equal to the time constant of the grid resistor and coupling condenser, and the filter resistor should be twenty times as great or greater than the capacitive reactance of the filter condenser at the lowest frequency to be used.

The filter system also aids the circuit inasmuch as it isolates this stage from the other stages, which might otherwise be coupled through the filter system in the 'B' supply.

## "Pulsed Light" for Television Stations

A new "pulsed light" movie projector for television stations has been developed by the General Electric Company's electronics department at Syracuse, N. Y., and will be sold in 16 and 35 mm size as a product in the G.E. television station equipment line, according to P. G. Caldwell, sales manager.

Precise electronic timing of illumination and camera tube scanning of movie film frames is a feature of the new projector. This is accomplished by using a mercury capillary lamp whose light pulses are timed and controlled by signals from the television station's synchronizing pulse generator which also times the "sweeps" of the television camera tube that views the film frames. The "on-off" light pulsing action of the mercury lamp eliminates the need for the mechanical shutter used in conventional movie projectors.

The mercury capillary lamp is operated at 10 times normal current (about 10 amperes) during its short period of operation (500 microseconds every 1/60 second) so that bright flashes of light are produced when the lamp is energized. Because of the intermittent operation, the average lamp current used is less than one-third of normal operation. And the lamp does not produce the heat created by light sources used in conventional projectors.

The mercury lamp, an optical system consisting of reflector and condensing lens which direct the light through the film, and an electronic pulse generator are "packaged" together and mounted on a standard projector pedestal in place of the conventional arc lamp or other light source. The rest of the mechanism is similar to that used in present-day television movie projectors, except for the elimination of shutters and associated gearing, shafts and guards.

(See page 42)



# RAYTHEON

MANUFACTURING COMPANY

*Excellence in Electronics*  
**RADIO RECEIVING TUBE DIVISION**  
 NEWTON, MASSACHUSETTS      CHICAGO

...and put Raytheon tubes in my set please." That's the customer specifying "Raytheon"—a name he knows to be synonymous with quality and dependability. Stock Raytheon tubes to keep your customers happy; to keep your business growing.

## IMMEDIATE DELIVERY!

Model 5015

### Clinton Walnut Automatic Radio Phonograph Combination

Beautiful walnut cabinet with hand rubbed piano finish, lid of seasoned walnut with core 13/16" thick, guaranteed against warping, 18 3/4" D. x 10 1/2" H. x 16" W. 5-tube radio, 6" dynamic speaker with Alnico five magnet, heavy duty power transformer, complete with tubes (6SA7, 6SR7, 6C5, 6V6, equi. 6X5) takes 12-10" or 10-12" records, automatic Crescent changer, dual volume and separate tone controls ..... **\$56.00**



Model R5515

### Clinton Electrola Automatic Radio Phonograph Combination

Expensive luxurious leatherette, brass hardware throughout with saddle stitched leather handle, 15" D. x 9 1/2" H. x 21" W.

5-tube radio, 6" dynamic speaker with Alnico five magnet, heavy duty power transformer, complete with tubes (6SA7, 6SR7, 6C5, 6V6, equi. 6X5) takes 12-10" or 10-12" records, automatic Crescent changer, dual volume and separate tone controls..... **\$49.50**



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 Write for our new illustrated catalog;  
 it's FREE!

Depf. B

## UNION Radio Corporation

328 S. Paulina • Chicago 12, Ill.

## IN TRADE

(From page 13)

ture of approximately eight inches wide by six inches high and will be able to tune in all 13 television channels without the need of service work. In addition to AM reception, this model will receive FM on the new frequency band and will also have an automatic record player in the phonograph. The company plans to market four television receivers by next year. They will range from a small direct-view table model to a de luxe large-screen projection re-

ceiver which will sell for almost \$1,200. Announcement of plans to market this complete unit, which will sell for approximately \$475, was made by Paul L. Chamberlain, manager of sales for the division, at a special sales meeting of district managers of the Electronics Department. Attending the meeting, which covered sales, manufacturing and advertising, were: W. M. Boland, San Francisco; R. J. Meigs, Kansas City; W. M. Skillman, Dallas; G. S. Peter-

son, Chicago; R. P. VanZile, Cleveland; T. B. Willard, Atlanta; T. B. Jacocks, Phila.; H. J. Mandernach, New York, and R. L. Hanks, Boston.

### Educational Sales

W. H. Knowles, well known in the audio-visual field, has been appointed manager of the Educational Sales activities of the RCA Victor Division, announces Walter M. Norton, director of distribution. Mr. Knowles will be responsible for the promotion and sale, in the educational field and in the field of industrial training, of audio-visual equipment such as the 16 mm projector, electron microscope, FM and AM radio, television receivers, RCA Victor records, transcription and playback equipment, disc and wire recorders. His department studies school requirements and assists teachers in utilizing the latest developments in audio-visual equipment.

### Name Change

A. A. Juviler, President of the Hamilton Radio Corporation, 510 Avenue of the Americas, New York, announced after a special stockholders' meeting yesterday, that the company name had been changed to Olympic Radio & Televisions, Inc. Other officers of the company are P. L. Schoenen, Executive Vice-President; J. F. Crossin, Director of Sales and Morris Sobin, Treasurer. A nationwide sales organization through 78 exclusive distributors has been set up.

### Lear Cabinets

To increase production of its home radios and combination radio-phonographs, Lear, Incorporated, has completed a long-term lease of all facilities of the Grand Rapids Woodcraft Corporation, 1400 Front Street, N.W., it was announced today. According to Elmer R. Crane, vice president of Lear, Incorporated, who completed negotiations with Joseph R. Wolf, owner of the furniture company, Lear will use the plant to assemble and finish a portion of its radio cabinets and consoles. Mr. Wolf will act as a consultant to Lear officials. Mr. A. F. Christy will be in direct charge for Lear.

### Television Antenna

One of the formidable problems facing television, the necessity for an antenna to be of a length one quarter of the size of the television wave-length received and yet able to receive all of the thirteen wave-lengths now assigned to commercial television by the Federal Communications Commission plus the various wave lengths assigned to Frequency Modulation has been solved by a new inexpensive re-

(See page 40)

## SERVICE DEALERS

Every issue of "RSD" carries Service Data on the popular new radio receivers now being manufactured. These Data Sheets fit into standard manuals—should be kept until new manuals are available—every technician wants this service!

"RSD" publishes more authentic articles on new servicing methods and new test equipment than other magazines. Trouble shooting is made easier—time is saved—more jobs can be done at greater profit.

Merchandising guidance is given to Service Dealers—from the 1-man shop owner to the biggest establishment. It's important to know how other successful Service Dealers conduct their business.

### YOU GET YOUR MONEY'S WORTH EVERY MONTH

During the past two years "RSD" has published over 305 pages of exclusive technical data . . . or about as much as the two contemporary trade papers combined. "RSD" also published over 200 pages of general interest and semi-technical material during the past two years—more than any other trade paper carried on these subjects. Besides—"RSD" carries more advertising from more manufacturers catering to Service Dealers. Subscribe to "RSD" today.

**USE THIS COUPON—FILL IN—RETURN IT TO US AT ONCE WITH YOUR REMITTANCE ATTACHED.**

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## SHOP NOTES

(From page 36)

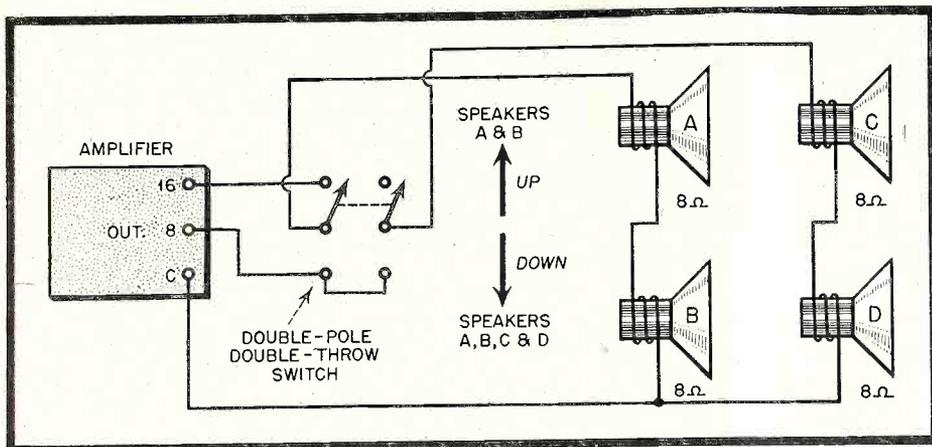


Figure 1.

about 1.8 amperes. If considerably less, rectifiers may be defective.

### PHILCO 41-608—LOW PHONO RECEPTION

If receiver operation is normal and phono operation low, the trouble is most likely due to a defective photo cell in the pickup.

### PUBLIC ADDRESS SYSTEMS.

In order to insure satisfactory operation of any P.A. installation certain

conditions and precautions must be observed. These are:

1. The power output of the amplifier must be such that adequate sound coverage of the serviced area is obtained.
2. The sensitivity of the microphone must be matched to the gain of the amplifier so that rated power output can be obtained with ordinary input levels.
3. The power handling capabilities of the loud speakers must be equal to or higher than the rated power output of

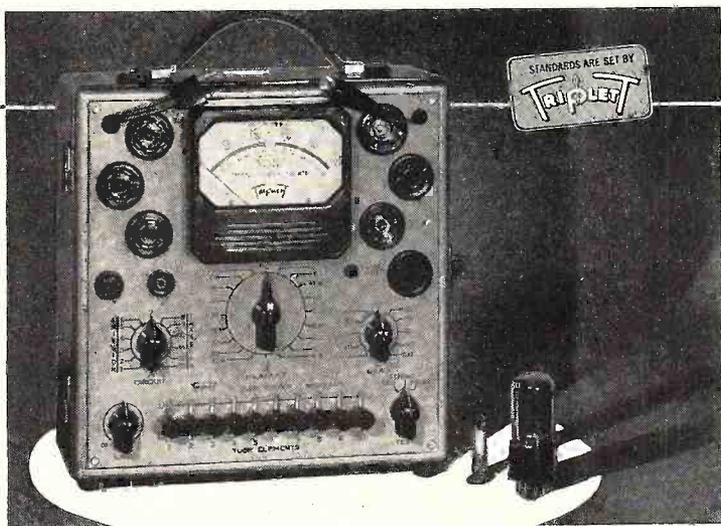
the amplifier.

4. The total impedance of the loud speakers must match the output impedance of the amplifier. For this purpose amplifiers are generally supplied with output impedance taps between 2 and 16 ohms for direct connection to the speaker voice coils, and one or more 500 ohm taps for connections to a line transformer. The low resistance taps are used where the distance between the speakers and the amplifiers is less than 50 feet. Distances greater than this require line transformer connections.

When matching loads to amplifiers, the laws of resistors in series, parallel, and series-parallel apply. Suppose it is required to connect up to 8 ohm speakers to an amplifier. The speakers may be connected in series to the 16 ohm tap or in parallel to the 4 ohm tap.

The series method of connection has the advantage that the line resistance is relatively small when compared to the total resistance of the speakers. However, should one speaker become open-circuited the whole system will become inoperative. In the parallel

(See page 45)



## A New TRANSCONDUCTANCE READING Tube Tester

### For the Man Who Takes Pride in His Work

Microhmo (Dynamic mutual conductance) readings and simplified testing—are two of the 20 exclusive features found in the new model 2425 tube tester. Transconductance readings are made possible through a simple measurement directly proportional to  $G_m$  and a properly calibrated measuring instrument. No possibility of grid overloading. "Short" and "open" tests of every tube element. Gas test rounds out full check of all tubes. New Easy-Test Roll Chart. These exclusive features, amplified by Triplet Engineering, make Model 2425 the outstanding 1947 tube tester.

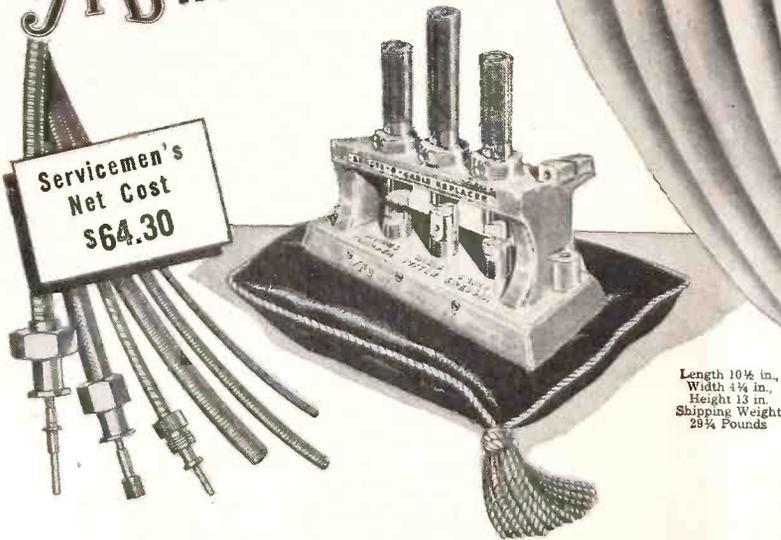
*Precision first*

# Triplet

*...to last*

ELECTRICAL INSTRUMENT CO. BLUFFTON, OHIO

# Presenting The New Improved JFD REMOTE-O-CABLE REPLACER



Servicemen's  
Net Cost  
\$64.30

Length 10 1/2 in.  
Width 4 1/4 in.  
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Shipping Weight  
29 1/4 Pounds

## The Most Efficient Auto Radio Tuning Cable-Servicing Machine in Use Today!

1. SWEDGES SHAFTING TO PREVENT UNRAVELLING.
2. CUTS SHAFTING TO EXACT LENGTH
3. REPLACES OLD FITTINGS ON NEW SHAFTING.
4. CASING GROOVE MAKES CUTTING EASY

J. F. D. MANUFACTURING CO., 4111 FT. HAMILTON PKWAY, BKLYN, N. Y.

## RECEIVER JOBS

(From page 22)

usually 8 mfd. or more each. Since C1 usually is from .006 to .02 mfd., such a replacement can be made slightly larger in capacity than the original, or an identical capacity can be used with hardly any noticeable difference.

Almost all of the circuit diagrams of the new post war receivers shown in "Radio Service Dealer" and other magazines, show condenser C1 connected as in Fig. 1. There may be some improvement in tone quality when checked with an oscilloscope, but it cannot be detected by the human ear. It is suggested that this condenser be connected as shown in Fig. 2 on all repair jobs, or at least make the change whenever any soldering is done around the audio tube socket, or when C1 has been disturbed in any way.

## IN TRADE

(From page 38)

ceiving antenna especially adapted to television.

This device is based on a patent application filed by the United States Navy on behalf of Dr. Frederick A. Kolster, well known radio engineer, for use on aircraft and naval vessels where space is at a premium and yet a variety of short-wave, ultra high, and VHF transmitters must be employed. While the Navy retains the royalty-free rights for its own and other U. S. Governments use, the commercial rights to all developments under this invention have been assigned to the United States Television Manufacturing Corporation by Dr. Kolster.

For television this means that a single broad-band antenna of inexpensive design can cover all commercial wave lengths desired. In the past quarter-wave dipoles have been used which can pick up a neighboring wave length satisfactorily, though with a loss in efficiency, that is in signal strength. However, to date there have only been a maximum of three television stations operating in any one city and those three have been on closely neighboring wave-lengths or channels.

In the next year or two, under the newly assigned commercial bands, or wave lengths, they may be as far apart as one hundred and sixty-two megacycles instead of the six to ten megacycle separation encountered to date. The antenna also tunes to the entire band of Frequency Modulation wave-lengths, and, of course, picks up ordi-

(See page 42)

## You Should Have An OLSON PANEL LAMP TOOL

for easy installation and  
removal of all size  
panel lamps



25¢  
POSTPAID

No  
C.O.D.'s

The slickest tool yet offered to the Radio Service Man. Made of live rubber, with two size openings so that any bulb will fit. No more fumbling to get at a burned-out lamp. No more squirming to install a new one. Put a couple in your kit!

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Send me \_\_\_\_\_ Panel Lamp Tools at 25c ea.  
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STATE .....

## MEN IN THE NEWS

(From page 38)



**Henry Hutchins**

Henry Hutchins announces formation of Hutchins Industries, 325 West Huron St., Chicago 10, Ill., and will specialize in the national distribution of radio and electronic products serving radio parts distributors.

Negotiations are now under way with manufacturers for radios, speakers, sound systems, inter-coms, and component parts. Hutchins Industries have been appointed National Sales Agents for Dilks compressed air Sound Systems of Norwalk, Conn. and are expediting and handling War Surplus for Hoffman Radio Corp. of Los Angeles.

Recently Mr. Hutchins was President of the J.M.I. Sales Corp. which has been dissolved. He was formerly General Sales Manager of the National Union Radio Corp. for many years during which time he returned to the Navy as Executive Officer of the U. S. Naval Officers Indoctrination School at the University of Arizona in Tucson.

To Henry—good luck!

### Farm Market Growing

About 3,000,000 farms — slightly more than half the total in the U. S. — are now using electric service, according to G. C. Neff, president Wisconsin Light & Power Co. An estimated 900,000 farms not taking service are within one-quarter of a mile of existing lines and may take service at their option. At the end of 1945, business-managed utilities served 1,811,000 farms, REA co-ops 1,050,691, and other agencies served 159,000 farms.

The big job of extending electric lines to the farms will be about completed by the end of 1948, when almost every farm is expected to have electric service available. Privately owned utilities are expected to connect about 600,000 farms in this period, and the co-ops an equal number.

# A LABORATORY QUALITY OSCILLOSCOPE For the Service Man . . .

Portable, sturdy, compact—the CRO-5A is an ideal unit for rapid, accurate, high quality service work. Check the utility and features which you have always wanted in the instrument on your bench.

- For better laboratory and production testing . . .
- For routine Service work . . .
- For studying any variable which may be translated into electrical potentials by means of associated apparatus . . .
- Designed with tubes for maximum amplification with minimum noise . . .
- Exceptionally stable trace even under adverse power line variations . . .
- Frequency response—essentially flat from 20 cycles to 350 KC . . .
- Completely self-contained . . .

Write to General Electric Company, Electronics Department SRS-6407, Syracuse 1, New York.



**CRO-5A**

**GENERAL  ELECTRIC**  
177-E2

## Automatic Combinations-NOW!

**The New Arnold Shure Automatic Wired Record Player ready for immediate delivery**

The Shure automatic record player connects easily to any radio. Its featherweight crystal pickup and quiet, smooth changer action assure high quality playing of ten 12" records or twelve 10" records. Every one of your customers can now own a fine automatic combination at a remarkably low cost.

Shure players are shipped complete with A.C. cord and shielded cable—only 2 wires to connect and it's ready to play.

**Your price only \$21.92 net.**

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OPA Retail Price \$31.30 Zone 1  
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Orders are now being accepted for immediate delivery—no waiting. Terms: 2% check with order. Or 25% deposit, balance express C.O.D.



### PHONO AMPLIFIERS

1-Tube Phono. Amplifier . . . . .	\$2.35 ea.
3-Tube Phono. Amplifier . . . . .	4.50 ea.

### PM SPEAKERS

4" Alnico (5) PM Speaker . . . . .	\$1.39 ea.
5" Alnico (5) PM Speaker . . . . .	1.49 ea.
6" Alnico (5) PM Speaker . . . . .	1.89 ea.

### TUBULAR ELECTROLYTICS

100-MFD-25 V. . . . .	.22 ea.	10-MFD-450 V. . . . .	.29 ea.
10-MFD-50 V. . . . .	.22 ea.	16-MFD-450 V. . . . .	.39 ea.
20-MFD-150 V. . . . .	.22 ea.	10-10-MFD-450 V. . . . .	.59 ea.
30-MFD-150 V. . . . .	.29 ea.	20-20-MFD-150 V. . . . .	.29 ea.
40-MFD-150 V. . . . .	.39 ea.	30-20-MFD-150 V. . . . .	.39 ea.
50-MFD-150 V. . . . .	.45 ea.	40-30-MFD-150 V. . . . .	.45 ea.
8-MFD-450 V. . . . .	.25 ea.	50-30-MFD-150 V. . . . .	.59 ea.

**HOLLANDER RADIO SUPPLY CO.**  
549 West Randolph Street Chicago 6, Illinois

## MERCHANDISE PRE-VIEWS

(From page 27)

systems are developed. Used first in auditoriums and on sound trucks, public address systems are now standard equipment in hundreds of other types of places where people gather. In armories, at carnivals and fairs, in athletic stadia, at race tracks, sound systems are now regarded as an essential part of the equipment.

They are used in ballrooms, dance halls and banquet halls. Night clubs and taverns find them an important aid

in entertainment. Hotels require them for paging in public rooms and there is a growing trend among hotels to install them in guest rooms or hotel corridors for fire warnings.

Industrial plants find thousands of uses for their installations as do stores, offices and other commercial enterprises.

Schools find them a great aid in large classrooms and auditoriums, as well as on their athletic fields.

Skating rinks and bowling alleys are other types of enterprises which get great value from their sound systems.

The basis of the system is the amplifying unit. These are installed with suitable microphones, record players,



50-Watt Amplifier can operate 2 to 12 speakers.

radio pick-ups and loudspeakers for each installation. Illustrated here is a 50-watt amplifier suitable for many of the above types of installations. It operates from 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. Other MASCO Sound Systems from 12 to 80 watts are also available.

Mark Simpson Manufacturing Company of Long Island City, New York, has free literature explaining the many purposes of these systems.

### Portable Time Switch

The "Robot" controls any household appliance that can be plugged into an electrical outlet. It is an electrical time instrument—not an ordinary electric clock with a switch added. It is powered by the same unit as used in recorders, controllers and other electrical instruments.

The 24-hour dial of the "Robot" has two pointers which can be set to turn appliances *on* and *off* at specified times. It is about three inches wide and five

(See page 44)

### "Pulsed Light"

(From page 37)

In network operation of television stations, the new G-E projector will allow comprehensive switching without difficulty. Wide tolerance on phase of the film-drive mechanism will permit simple methods to be used for making the projector "follow" the station synchronizing. It will not be necessary to dictate the phase and frequency of the synchronizing signals which govern the whole television system.

## SPEED UP REPAIRS WITH THESE G-C AIDS!

G-C is HEADQUARTERS for  
RADIO PARTS and SERVICE AIDS



All Types  
of Radio  
Cements,  
Chemicals,  
Coil Dopes,  
Compounds

G-C leads the field in  
supplying Radio-Electronic  
Manufacturers and Service  
Men with Parts, Tools,  
Radio Cements, Chemicals  
and Compounds. Insist  
on Genuine G-C  
Quality.



Dial Cables, Dial Belts,  
Packaged Hardware,  
Cabinet Repair Kits

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Wire  
Strippers

Alignment Tools  
Ne-O-Lite Testers

Order from Your Jobber — Send for G-C Catalog



**GENERAL CEMENT MFG. CO.**  
ROCKFORD, ILLINOIS

### STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

OF RADIO SERVICE DEALER, published monthly at Orange, Connecticut, for October 1, 1945.

State of New York }  
County of New York } ss.:

Before me, a Notary Public, in and for the State and county aforesaid, personally appeared Sanford R. Cowan, who, having been duly sworn according to law, deposes and says that he is the Publisher of RADIO SERVICE DEALER, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the dates shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business manager are: Publisher, Sanford R. Cowan, 1620 Ocean Ave., Brooklyn 30, N. Y.; Editor, Lewis C. Stone, 235 E. 22nd St., New York 10, N. Y.; Business Manager, S. R. Cowan, 1620 Ocean Ave., Brooklyn 30, N. Y.

2. That the owners are: Cowan Publishing Corp., 342 Madison Ave., New York 17, N. Y.; and Sanford R. Cowan, 1620 Ocean Ave., Brooklyn 30, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent, or more of total amount of bonds, mortgages, or other securities, are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock, and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

(Signed) SANFORD R. COWAN, Publisher.

Sworn to and subscribed before me, this 18th day of September, 1946.

(Seal.) SYLVESTER J. VITKANSAS, Notary Public.

Kings Co. Clk's No. 12, Reg. No. 64-V-8; N. Y. Co. Clk's No. 48, Reg. No. 90-V-8; Bronx Co. Clk's No. 1, Reg. No. 28-V-8. Commission Expires March 30, 1948.

## Huge Christmas DEMAND FOR CHILDREN'S RECORDS

**T**HE present demand for children's records is phenomenal. Not five years ago less than two million children's records were pressed by the industry. This year more than 27,000,000 records will be produced, and it is doubtful whether that figure will meet the demand. Performing as they do the functions of both story book and story teller, records have become a major item for Christmas giving.

To meet the huge demand for children's sets and records, Columbia Recording Corporation has just released a group of eight new children's albums and expedited production of all repertory popular to Young America, announces Paul Southard, vice-president in charge of sales.

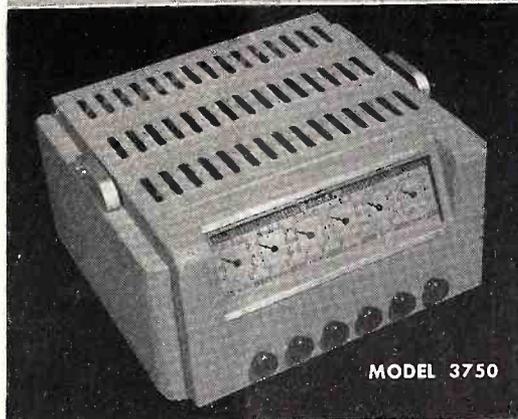
Gene Kelly, popular MGM song and dance man, is featured in five of the new sets, including such popular items as "Peter Rabbit" (Set J-30), "Nursery Songs—Volume I" (Set J-26), "The Little Red Hen" (Set J-MJ-27,) and "The Shoemaker And The Elves" (Set J-MJ-29,). In the same release are three albums by the cast of the CBS children's program, "Let's Pretend"; including "Puss In Boots" (Set J-MJ-33), "Cinderella" (Set J-MJ-32), and "Jack And The Beanstalk" (Set J-MJ-31.) Mr. Kelly has also recorded for Columbia "The King Who Couldn't Dance" (Set J-25) which has been a best seller for some time. "Little Black Sambo," narrated by Don Lyon with orchestra is another popular children's story featured in the new releases.

### Children Want Records

The addition of these albums to Columbia's Children's catalog is the result of a survey of record stores, book stores and public schools, to determine the most popular literature and repertory in the children's field. It was the aim in these albums to meet the tastes of children in all age groups.

"We were aware that in making children's records we were working for a very critical audience," said Goddard Lieberman, vice-president in charge of Masterworks, children's and educational records. "Children have clearly defined tastes and know what they like. In fact if a child takes a fancy to a record, he will play it over and over again. Thus we take pains that our Children's albums shall not be diluted adult material, but stories especially conceived for a youthful public."

## Another BELL SOUND Standard Bearer out front with sales appeal!



MODEL 3750



### STAY A STEP AHEAD IN PROFITS WITH BELL SOUND SELLERS

Here's power-packed, high-fidelity performance in a smart, compact 50-Watt Amplifier with remarkably extensive coverage. The new "Sound-Master" has wide-range bass and treble controls, plus volume controls for 3 mikes and 1 phono, all handily arranged for easy, precise adjustment. Check the "specs" on this up-to-the-minute Model 3750 for other outstanding features.

This is only one of many BELL "best sellers," for all commercial and industrial sound needs. Ask about BELphone "intercom" systems, recording and disc-playing units, P.A. systems, permanent and portable amplifiers, industrial voice-paging and broadcasting equipment, and other electronic sound devices. Satisfy market demands and boost your profits with these advanced BELL Sound Systems. Your nearby BELL distributor has details. See him today.



**BELL SOUND SYSTEMS, INC.**  
1202 ESSEX AVENUE COLUMBUS 3, OHIO  
Export Office: 4900 Euclid Ave., Cleveland 3, Ohio



## RADIO PARTS SETS • AMPLIFIERS Concord Catalog FREE!

Revised! Up-to-the minute! Listing the newest, the latest and best in RADIO PARTS, RADIO SETS, AMPLIFIERS, AMATEUR GEAR, ELECTRONIC EQUIPMENT, SUPPLIES and ACCESSORIES! Hundreds of items for every Radio and Electronic need—Condensers, Resistors, Transformers, Tubes, Test Equipment, Tools and Repair, Replacement and Maintenance Parts of every kind. ●●● All standard top quality, nationally famous makes, are fully represented in the great new Concord Catalog. Complete lines including new and hard-to-get parts and equipment at latest O.P.A. prices or lower. Thousands of items—and complete stocks ready for immediate shipment from CHICAGO or ATLANTA. Your copy of the new Concord Catalog is ready now—FREE! Mail the Coupon below.

SEE... COMPLETE SHOWING of ham gear, equipment, supplies and accessories for AMATEURS, ENGINEERS, SERVICEMEN, SOUNDMEN, RETAILERS.

SEE... the first peacetime Concord line of modern Radio Sets and Radio Phonograph combinations—featuring a host of new, approved post-war developments... richer tone quality... super-selective tuning and reception... high fidelity... new modern design cabinets.

SEE... the thrilling new MULTIAMP Add-A-Unit Amplifiers, entirely new and revolutionary development in amplifier engineering. Sensational flexibility, power, fidelity, and economy, exclusive with Concord!

All in the new complete Concord Catalog... Mail the COUPON Now!

**10H 40 MA. CHOKE**  
Extremely compact highly efficient choke well suited for auto radio receivers and AC/DC radios. Also excellent filter chokes for other receivers and amplifiers. 1 5/16" x 1 1/4" x 1 1/8" ins. Unshielded strap type mounting. **46¢**  
C1601

**Midget Electrolytic**  
Midget dry electrolytic will handle any job requiring an electrolytic capacitor. Polarity clearly indicated. Barely replaces larger wire leads. Easily replaces larger capacitors. Cap. Mfd 20-20. DC-WV 150. 3/8" x 2 inches **60¢**  
C3153

**ROTARY SWITCH**  
Single gang, 6 pole, 3 position, shorting switch, 1 5/16" dia. with 1/4" shaft dia. Threaded bushing 3/4" long, 3/8" shaft. **39¢**  
5B3984

**CONCORD**  
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LAFAYETTE RADIO CORPORATION  
CHICAGO 7 ATLANTA 3  
901 W. Jackson Blvd. 265 Peachtree Street

CONCORD RADIO CORPORATION, Dept. K-106  
901 W. Jackson Blvd., Chicago 7, Illinois  
Yes, rush FREE COPY of the comprehensive new Concord Radio Catalog.

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ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

**Order from LAKE!**  
**You'll Make No Mistake!**

**RADIO CABINETS & PARTS**

**NOW AVAILABLE!**  
**Postwar 2 Post RECORD-CHANGER**



with luxurious brown leatherette portable case, 15" L. x 15" W. x 10" H.

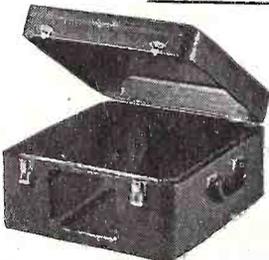
D. Latest electronic developments make this modern record-changer the finest on the market today!

Changer ..... **\$19.00**  
 Cabinet for same..... **8.95**

**DE LUXE RECORD-CHANGER and AMPLIFIER CASE**

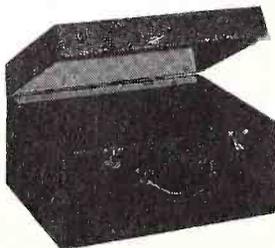
De luxe changer case with ample room for amplifier. Overall dimensions, 20" L. x 16" W. x 10" H. Sturdily built of 5/8" plywood, de luxe brass hardware throughout. Inside dimensions: 15 1/2" L. x 14 1/4" W. x 9 1/2" H.

Net ..... **\$12.95**



**DeLuxe 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 net price..... **\$8.95**



Portable Phono-graph Case of sturdy durable plywood in handsome brown leatherette finish. Inside dimension 16 1/2" long, 14" wide, 9 1/2" high. Has blank motor board. As illustrated. Specially priced at

**\$6.95**

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 8 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 7/8"	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.

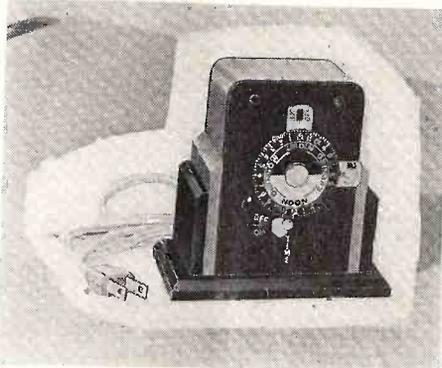
**Order our New Catalog Today!**  
**Get on our mailing list!**

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

**MERCHANDISE PRE-VIEWS**

(From page 42)

inches high and comes in an attractive metal and plastic case. The cord at-



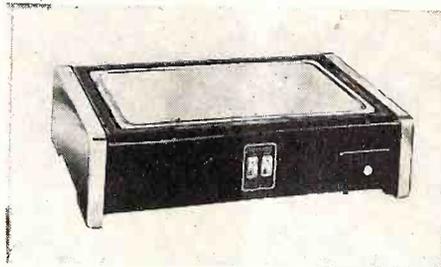
Height, 5 7/8"; depth, 15"; length, 22 1/2"; griddle weight 23 1/2 lbs.; shipping weight, 33 pounds net. Further information may be obtained by writing Thermador Electrical Mfg. Co. 5119 District Blvd., Los Angeles, Calif.

**AC Phonograph Operation On DC**

A new vibrator inverter permits operation of alternating current phonographs with direct current, now in production by Electronic Laboratories, Inc., (See page 46)

tached to the "Robot" may be plugged into any electrical wall socket. Lamps, radios, refrigerators and other appliances are then plugged into a socket in the device and are actuated at the desired time. Refrigerators may be defrosted each night by the "Robot" during the early morning hours—eliminating the usual defrosting inconvenience and permitting the refrigerator to work at top efficiency at all times.

The Miller-Harris Instrument Co. also produces a number of other control units among which are the Heat-O-Meter, the TS3 Time Switch, Poultry House Time Switches, Interval Timers, Photographic Process and Exposure Controls. 1434 W. Atkinson Ave., Milwaukee 6, Wis.



**Speed Griddle**

Production of the Thermador Electric Speed Griddle has once again been resumed, designed for use at the table, in the kitchen or on the patio for grilling bacon, eggs, hamburgers, pancakes and many other short-order specialties. The large cooking surface (171 square inches), will fry eight hot cakes at the same time.

A polished aluminum griddle top eliminates the necessity of using grease in cooking pancakes and eggs; new toggle-type switches that provide low heat (500 watts), medium heat (1000 watts) and high heat (1500 watts) at 120 volts A.C.; all porcelain enameled body, chromium steel ends and rubber feet; and six foot heavy duty cord with spring action plug that fits into any standard wall convenience outlet.

**Radio Books For Radio Servicemen**

**"INSIDE THE VACUUM TUBE"**

A goldmine of information for the student, amateur, serviceman or engineer.

425 PAGES PRICE \$4.50

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- THE CATHODE RAY TUBE AT WORK . . . . \$4.00
- FREQUENCY MODULATION . . . \$2.00
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- AN-HOUR-A-DAY-WITH-RIDER SERIES—on "Alternating Currents in Radio Receivers," on "Resonance & Alignment," on "Automatic Volume Control," on "D-C Voltage Distribution." Hard bindings . . . \$1.25 each

**JOHN F. RIDER PUBLISHER, INC.**  
**404 - 4th Ave. N.Y. 16, N.Y.**

Specializing in books for advancement of the radio servicing industry.

## SHOP NOTES

(From page 39)

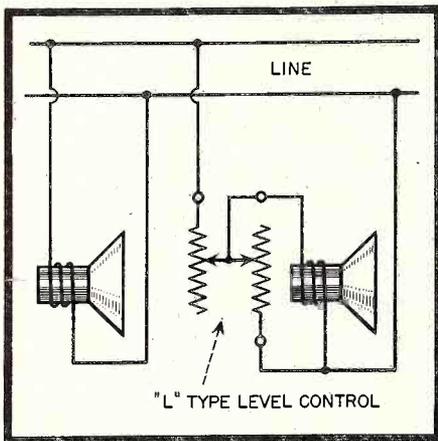


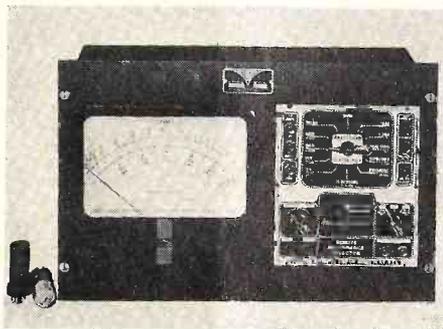
Figure 2.

method of connection the failure of one speaker will not render the complete system inoperative. However, the total impedance of the speakers is reduced to a value comparable with the line, and considerable line loss results.

Fig. 1 illustrates the connections to a system requiring master-control operation of 2 or 4 speakers without disturbing the impedance match. In this diagram correct speaker phasing is adhered to.

Whenever it becomes necessary to adjust the volume of a particular speaker, in a group, without changing the output of the other speakers or affecting the impedance match of the system, it is advisable to use a level control for this purpose.

Fig. 2 illustrates a typical circuit using an "L" type level control. The resistance value of the control is the same as that of the voice coil. Furthermore, the impedance of the combination is also that of the voice coil. This circuit can be applied to any speaker in Fig. 1.



### Multi-Range Selector

Precision Apparatus Co., Inc., 92-27 Horace Harding Blvd., Elmhurst, N. Y. announces production of a 41-range, panel mount, AC-DC laboratory circuit tester, incorporating a 9" rectangular, 5000 ohms per volt meter. This instrument is designated as Series 864.

The Series 864 Deluxe Multi-Range Tester provides the functions of an AC-DC voltmeter, ohmmeter, milliammeter, ammeter and decibel meter. It is housed in a standard 12 1/4 x 19" panel with completely enclosed rear dust cover and is designed for standard relay rack mounting. The separately enclosed remote control range selector unit slides easily out of its panel compartment for convenient bench operation. A seven foot flexible cord, permanently connecting meter to remote selector unit allows complete freedom of manipulation while the panel-mounted 9" meter is permanently out of the path of flying nuts, bolts and tools. A wide selection of ranges is provided up to 6000 volts AC and DC; 20 megohms, 12 amperes, 70 db. For additional information write the manufacturer.

### Decontrolled

Television receiving sets in combination with radio sets. (Those not in combination sets have already been removed from price control.) Effective Sept. 11, 1946.

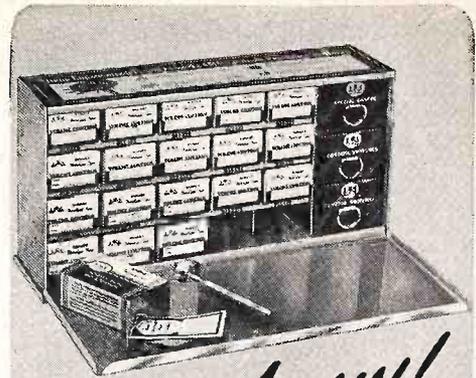
NEWCOMB JOBBERS LEAD THE FIELD IN PROFITS SELLING THE FINEST EQUIPMENT MADE TODAY

**AMERICA'S  
TOP QUALITY  
AMPLIFIER  
WILL GIVE  
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MORE PROFIT  
PER SALE**

A sound rule for increasing jobber profits will be sent to you upon request. Write for free booklet.



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**BACK AGAIN!**  
**IRC**  
**VOLUME CONTROL KIT**

THE KIT THAT ENDS YOUR STOCK HEADACHES

Here's a time-saver, service speeder—IRC Volume Control Kit, 18 Type D All-Purpose Controls, 6 Switches and 5 Special Shafts—a wide utility stock suited to 87% of all replacements.

This kit is delivered to you factory-packed in an attractive all steel cabinet, which provides 20 individual, marked compartments for the controls—you see at a glance what types to reorder. Three handy drawers accommodate switches and shafts. The hinged cover fastens shut securely so the cabinet may be carried with you when required. Base is arranged for stacking where more cabinets are needed.

The cabinet is FREE with the kit of 18 controls ordered at standard control prices. It is not sold separately. Order from your IRC distributor today!



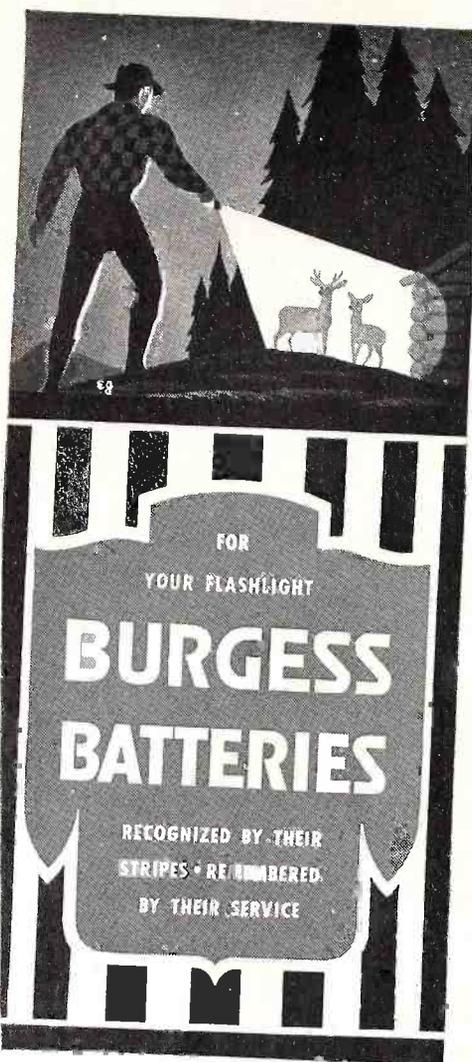
ALL STEEL  
CABINET  
FREE WITH  
ORDERED  
CONTROLS



**INTERNATIONAL  
RESISTANCE CO.**

401 N. BROAD ST., PHILADELPHIA 8, PA.

Canadian Licensee: International Resistance Co., Ltd., Toronto



**Longer nights mean increased sales of flashlight batteries**

... and 20,000,000 pairs of eyes will see this striking reminder in leading magazines in the next few weeks. Order Burgess Batteries now to be ready for flashlight check-up time. Display-packed for compact counter display and quick sales.



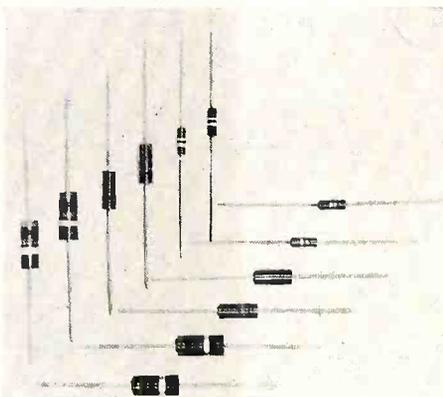
**FREE DEALER HELPS!**

BURGESS BATTERY COMPANY  
Dept. 62, Freeport, Illinois  
Please send free display card on BURGESS Flashlight Batteries.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

**Merchandise Pre-Views**  
(From page 44)

Indianapolis, according to Walter E. Peek, vice-president. The unit is 4½ x 4 x 2¼ inches, weighs only 14 ounces, can be installed under the turntable or in a corner of the phonograph cabinet. Input 115 volts d.c.; output, 110 volts, 60 cycle alternating current, providing a maximum load capacity of 25 watts. The vibrator inverter may also be used with timing devices, AC electric razors and similar items equipped with small synchronous motors of low wattage requirements.

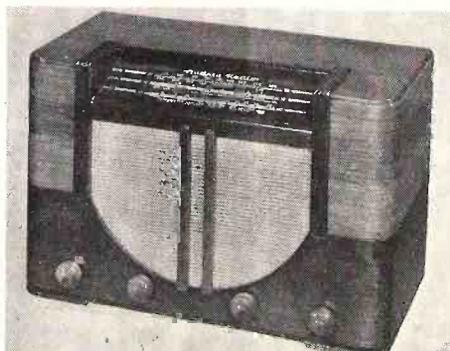


**Resistors**

Composition resistors for the radio serviceman, and other users of electronic equipment, are announced by the Specialty Division of General Electric Company's Electronics Department.

Capable of being operated at full rating in ambient temperatures up to 70 degrees (168 degrees F.), the resistors are available in standard RMA resistance values and in sizes of one-half, one and two watts. Three hundred and fifty volts RMS may be applied continuously to the one-half watt unit, 500 volts RMS to the one watt unit, and 1000 volts RMS to the two watt unit, providing the wattage rating is not exceeded.

Further information and a specifications sheet on the newly-announced resistors may be obtained on request to the company at Syracuse, N. Y.



Now in production by Andrea Radio Corp., L. I. City, N. Y. — Table Model T-16AC; Model T-U16, AC/DC.



• Yes, it's Aerovox for resistors, too. The latest Aerovox catalog contains a solid page of resistor listings. There are "Slideohm" wire-wound vitreous-enamelled adjustable resistors (25- to 200 watt); "Pyrohm Junior" fixed resistors (10- and 20-watt); insulated molded carbon resistors in ½ and 1 watt ratings. It's a stream-lined, most-handly, minimum-stock selection geared to profitable servicing.

**• Ask Our Jobber . . .**

Ask for Aerovox resistors when you are ordering Aerovox capacitors. They go together! 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.

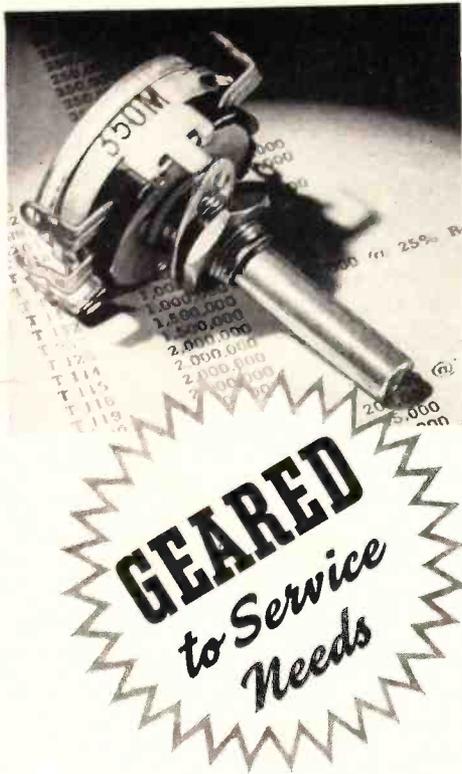
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RSD Circulation Dept.

**Cowan Publishing Co.**

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



★ The latest Clarostat Catalog No. 46 is chuckful of listings of many different types of resistors, controls and resistance devices. Yet each and every type and value has been selected because it is definitely geared to service needs. Yes, you can save a lot of time, effort and expense by referring to this Clarostat Catalog No. 46.

★ SEE OUR JOBBER . . .

Ask him for your copy of the latest Clarostat catalog. Use it in your daily work. Ask our jobber for those controls or resistors you need in your work. Or if you prefer, write us for the catalog.



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

**\$1.00 PAID  
FOR SHOP NOTES**

Write up any "kinks" or "tricks-of-the-trade" in radio servicing that you have discovered. We will pay \$1 for such previously unpublished "SHOP NOTES" found acceptable. Send your data to "Shop Notes Editor," RADIO SERVICE DEALER, 342 Madison Ave., New York 17, N. Y. Unused manuscripts cannot be returned unless accompanied by stamped and addressed return envelope.

**In Trade**

(From page 40)

nary broadcasting AM wave lengths which present no additional problem.

**Dealer Display Contest**

RCA Victor Records will cap its Warner Bros. "Night and Day" promotion—the company's biggest film tie-in to date—with a nationwide window display contest open to all RCA Victor Record dealers, according to J. M. Williams, Record Department advertising manager. The contest closes December 31. First prize for the display contest winner is a free trip to Hollywood for two, including visits to the Warner Bros. studio and RCA Victor's record pressing plant and studios. Five other prizes are offered to runners up, ranging from \$150 to \$25.

Dealer windows will be judged on the basis of originality and effectiveness of display and a 50-word or less essay on "How Movies Stimulate Record Sales." Contestants are asked to send three photographs of their window to RCA Victor in Camden, N. J. addressed to the "Night and Day" Window Display Contest, Building 2, Floor 8. Photos are to be taken at the contestant's expense. Duplicate prizes will be awarded to any two entries of equal merit by a committee of judges that includes J. W. Murray, Vice-President in charge of RCA Victor Activities, and the following RCA Victor Record executives: J. L. Hallstrom, general merchandise manager; M. Seklemian, general sales manager; H. J. Allen, field sales manager; R. Q. Weddell, director of publications, and advertising manager Williams.

**Dealer Aids**

Two aids for dealers—one an improved metal record outdoor sign, on which production was discontinued during war years because of metal shortages, the other a "sign blazer," described as a radical new development in fluorescent lighting display technique, are offered by RCA Victor.

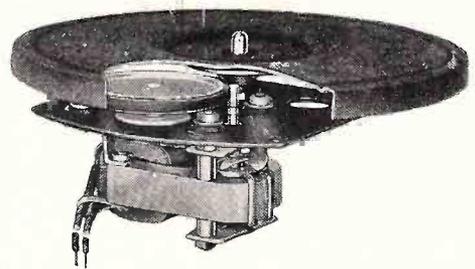
The "Sign Blazer" is 10¾ inches high by 26¾ inches long. Glass face, illuminated by two 20 watt standard fluorescent tubes, is 8¾ inches high by 21 inches long. It can be displayed by a suspension cord or as a standing display on floors, counters or tops of stock racks.

The new metal outdoor sign, made of 20 gauge steel, with silk screen identification copy, is larger than the pre-war model. Finished in shiny black, the color scheme displays a red label with lettering in white. The sign comes equipped with an ornamental bracket for hanging.

**Smooth Running  
Smooth Selling**

with

*Smooth Power*



You'll build smoother performance into your phonographs, recorders and record-changers when you equip them with GI *Smooth Power* Motors.

Every unit in our wide line provides that combination of quick pick-up, unvarying speed and velvety operation which pleases customers and makes your selling job easier.

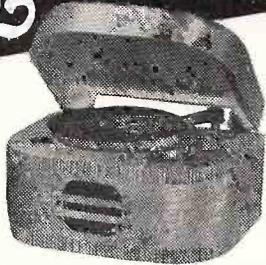
For smooth running and smooth selling, *standardize on Smooth Power Motors.*



Dept. MS

Elyria, Ohio

**R-L PORTABLE & TABLE MODEL RECORD PLAYERS**



Beautifully designed cabinet of matched birch veneer. Built-in amplifier, 5" PM speaker with Alnico #5 magnet. Light-weight tone arm assures longer life for records. Shipping weight, 13 lbs.

**B6201 Net \$26.97**

Portable model similar to B6201, with wood case covered in smart two-tone leatherette. Shp. wt. 17 lbs.

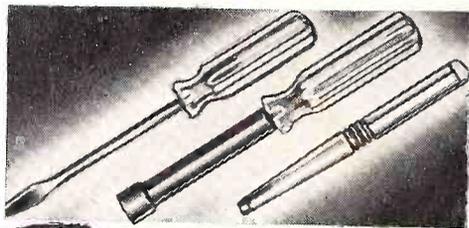
**B5816 Net \$28.22**



Write for Free 1946 Parts Catalog



731 West Washington Boulevard  
DEPT. S CHICAGO 6, ILLINOIS



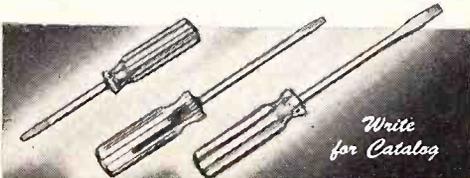
For Every  
**RADIO NEED**  
there's a fine

**VACO**

Shock-Proof • Break-Proof  
Amberyl Plastic Handle  
**SCREW DRIVER**  
to do the job better!  
**173 TYPES**



317 E. ONTARIO ST. • CHICAGO 11, ILL.  
Canadian Warehouse: 560 KING STREET, WEST • TORONTO 2, ONTARIO



Write for Catalog

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**Emerson Radio Vice President**

Harvey Tullo, who recently rejoined Emerson Radio and Phonograph Corporation as director of purchases was elected vice president in charge of purchasing, at a recent Board of Directors meeting, according to Benjamin Abrams, president. Mr. Tullo recently left the Zenith Radio Corporation of Chicago where he was Vice President in charge of Purchasing. Previously he served in purchasing capacities for the Kolster and Pilot Radio Companies.

**Snyder SM**

Dick Morris, widely known in the auto radio antenna and auto accessories field, has been appointed general sales manager for the Snyder Manufacturing Company, of Philadelphia, it was announced by Ben Snyder, president.



**FREE! Radionic Catalog**

Don't miss your copy of this big new 1947 catalog of radio parts, P.A. Test Equipment, Tubes, accessories and CHANCELLOR RADIOS.

**RADIONIC EQUIPMENT CO.**  
Dept. 3010-170 Nassau St., N.Y. 7, N.Y.

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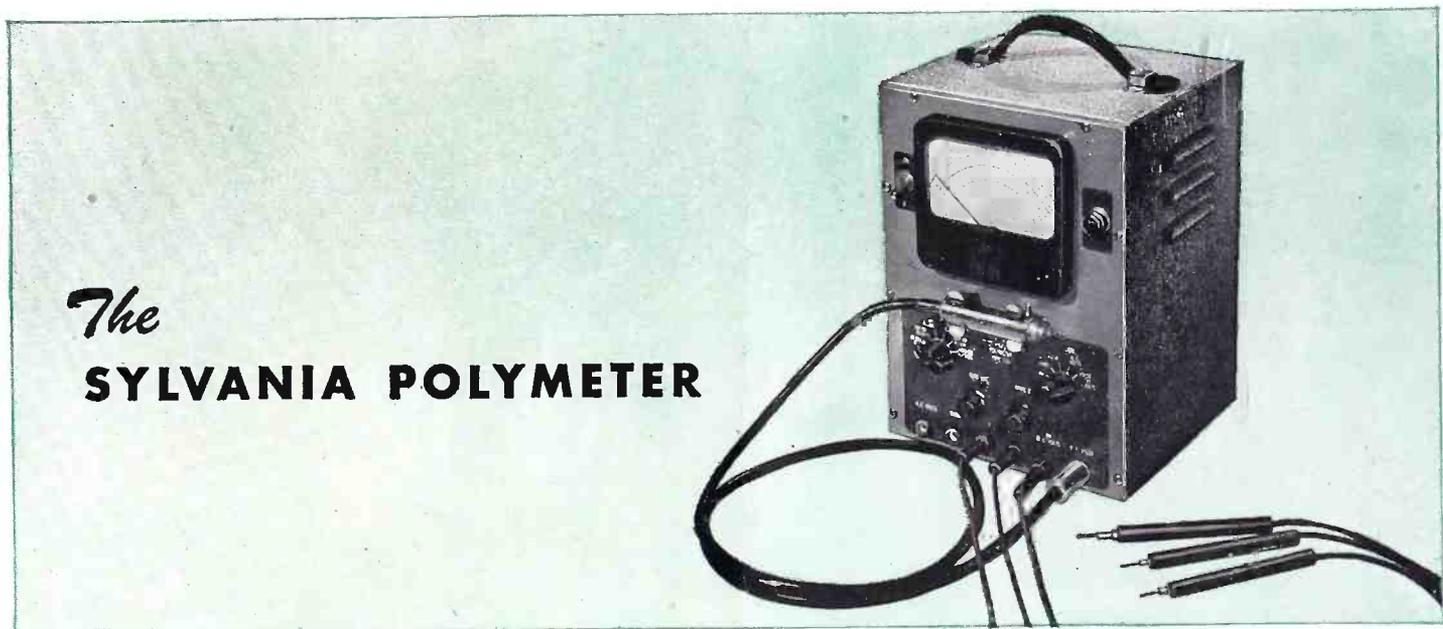
# SYLVANIA NEWS

## RADIO SERVICE EDITION

OCT. Prepared by SYLVANIA ELECTRIC PRODUCTS INC., Emporium, Pa. 1946

# ONE DEVICE NOW USED BY RADIO SERVICEMEN FOR GREAT VARIETY OF TESTS

## Electrical Measurements Made Easy With New Sylvania Unit!



Radio servicemen now can use the new Sylvania Polymeter type 134 to facilitate a multitude of electronic measurements and tests to radio equipment.

This product of Sylvania Research is stabilized against errors due to voltage variations or gas current in tubes. All accessories included. See your Sylvania Distributor.

### CHARACTERISTICS AND SPECIAL FEATURES

Tests audio, A.C. and R.F. voltages from 20 cps to 300 mc through use of proximity fuze-type tube built into handy probe. Full scale range of 3, 10, 30, 100, 300.

Measures D.C. from .1 to 1,000

volts in full scale ranges of 3, 10, 30, 100, 300, 1,000.

Measures D.C. current from .1 milliamperes to 10 amperes in full scale ranges of 3, 10, 30, 100, 300, 1,000 milliamperes and 10 amperes.

Measures resistance from  $\frac{1}{2}$  ohm to 1,000 megohms in full scale ranges of 1,000, 10,000, 100,000 ohms and 1, 10, 1,000 megohms.

### ACCURACY

D.C. ranges  $\pm 3\%$  of full scale.

A.C. ranges  $\pm 5\%$  of full scale up to 30 volts and  $\pm 7\%$  above 30 volts.

R.F. ranges  $\pm 5\%$  of full scale up to 10 volts;  $\pm 7\%$  from 10-100 volts;  $\pm 10\%$  on 300 volt range.

Ohms  $\pm 6\%$  to the left of  $\frac{1}{2}$  scale;  $\pm 13\%$  to the left of  $\frac{3}{4}$  scale.

Current  $\pm 3\%$  of full scale on all but 10 ampere scale which provides  $\pm 5\%$  of full scale.

### INPUT IMPEDANCES

R.F. ranges—2.7 megohms resistance shunted by approximately 3 mmf. capacity.

A.C. ranges—2.7 megohms resistance shunted by approximately 40 mmf. capacity.

D.C. ranges—16 megohms resistance.

Remember the Sylvania Polymeter type 134. It's beautifully styled, compactly designed, has easily read meter and dials.

# SYLVANIA ELECTRIC

Emporium, Pa.

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



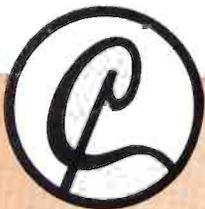
**Cunningham's** great line  
of receiving tubes is your assurance  
of bigger profits

CUNNINGHAM'S line of metal, glass, and miniature receiving tubes meets practically every service requirement. With Cunningham tubes you won't need to carry additional lines to round out your stock—and you'll seldom have to turn away a customer.

And you can be sure that Cunningham has or will have the right type tubes for the new AM, FM, and television receivers

that are on the way—because Cunningham is backed by the engineering leadership of the Radio Corporation of America.

Remember, too, that Cunningham Electron Tubes are *built for service*. They've been famous for over 30 years for their *consistently* high quality, long life, and top performance. That's why customers look for the big "C" in your store window when they need new tubes.



LISTEN TO "THE RCA SHOW," SUNDAYS, 2:00 P. M., EST, NBC NETWORK

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AND DEALERS BY THE RADIO CORPORATION OF AMERICA**