

radio service dealer

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In
This
Issue:

Test Equipment Schematics
Multi-Testers — New Service Plan
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September, 1944
25c



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by
FRANK FAX

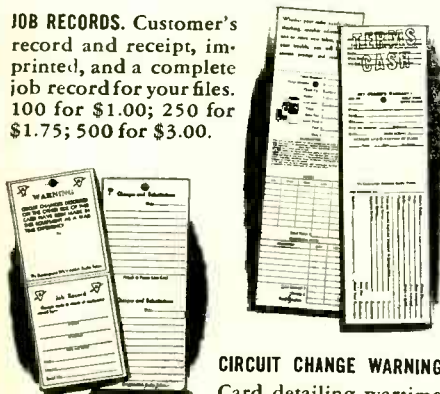


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RADIO DIVISION

September, 1944

radio service dealer

Covering all phases of radio, phonograph, sound and electrical appliance merchandising and servicing.

VOLUME 5, NUMBER 9

SEPTEMBER - 1944

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with the editor

Resumed Civilian Production

ALTHOUGH appliance manufacturers have been given the go-ahead signal by WPB, material shortages greatly retard most production schedules, and will for a while. Motors for mixers, refrigerators and vacuum cleaners and chrome-nickel wire for toasters and ironers are practically unobtainable.

No civilian radio set production is likely to be authorized this year but will be as soon as Germany falls. Signal equipment orders ex-

ceeding a quarter-billion dollars a month are being processed by manufacturers, leaving them no facilities for civilian production.

Most receiver manufacturers have already announced that they are all set to resume civilian production and merely need a green light. Dealers, distributors and the buying public are straining at the leash waiting for merchandise. When Germany goes "Boom!" radio-appliance dealers will enjoy a boom, and that's not double-talk.

War Veteran Subsidies

IT is rumored around the Capitol that legislation is being considered whereby honorably discharged war vets, who want to start their own business, may be granted a Government loan, subsidy or bonus approximating \$2,000. Such an amount would amply suffice to establish a radio-appliance service dealer business. Millions of men in the Armed Forces have learned a lot about radio in the past two

years and naturally many plan to make it their postwar life profession.

Progressive dealers, meanwhile, are already accepting down-payments on to-be-delivered radios and appliances, with customers to be served in order of receipt of their commitments. Better start looking into this clever merchandising idea.

"Victory Line" and L-76 Revoked

WPB made two excellent moves on August 28th. First, the production of so-called "Victory Line" components was ordered stopped so manufacturers can concentrate their efforts on standard lines, the increasing over-run of which is to be made available for civilian use. Second, L-76 which prohibited the production of many tube types, especially battery set types, and

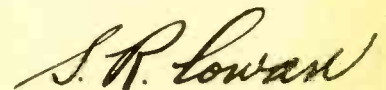
which limited production to 117 types, was revoked. Dealers must not expect distributors to get immediate delivery of standard parts or scarce tubes for the "Victory" parts will still come through for some time, and tube makers are not able to swing into restricted-type tube production at once. But the over-all picture is brighter.

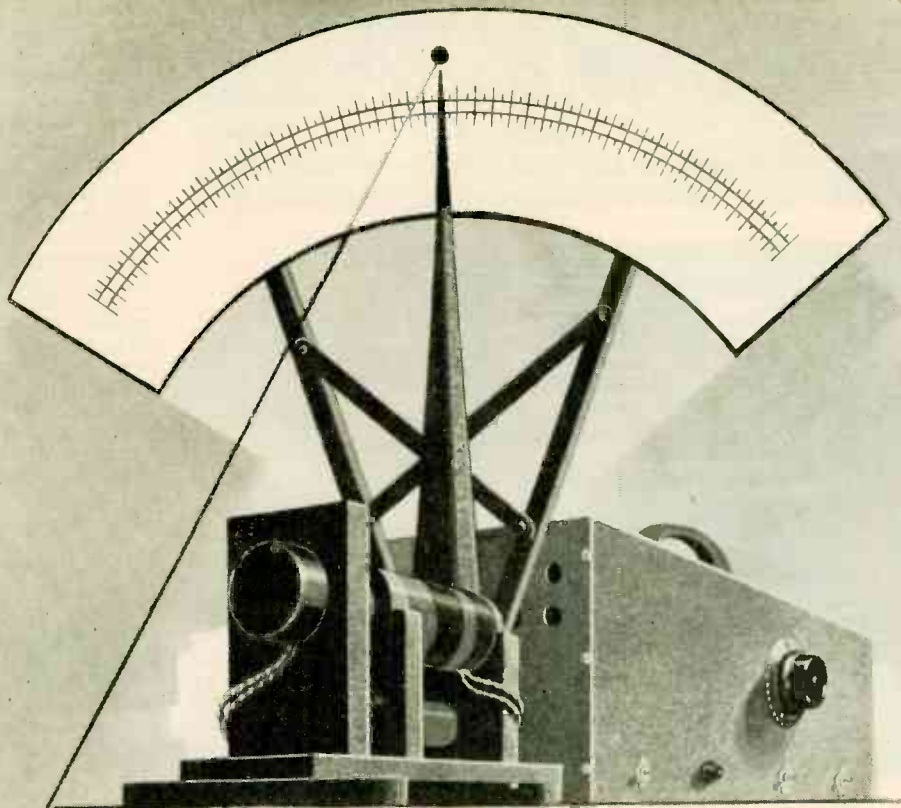
Impending Industry Conference

THE October 19-21 Electronic Parts & Equipment Industry Conference being held at Chicago, co-sponsored by the RMA's Parts Division, Sales Managers Clubs and NEDA should accomplish great deeds for the industry as a whole, and particularly for dealers and distributors.

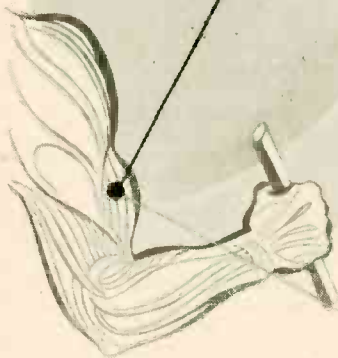
It is regrettable that no one organization, national or sectional,

exists to represent the interests of all service dealers at the Conference. As the bulk of the Nation's leading service dealer establishments subscribe to this publication, we shall try to represent them, "sincerely although not with official authorization."





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● The might of this midget motor is no secret to this special dynamometer used in the Utah laboratory. It accurately measures the horsepower; actually pre-determines the successful performance of this Utah motor in its many vital functions in actual use.

Utah's complete testing service is

playing an important part in the war effort today, and is scheduled for an equally important role tomorrow . . . in adapting war-born electronic and radio developments to commercial and consumer needs. ★ ★ ★

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In & Around the Trade

Being a condensed digest of some of the happenings in and around the radio trade as compiled by the Editors



Frank M. Folsom, vice president, shakes hands with Bickford of Buffalo's Paul Wolk, RCA Distributors.

RCA Victor Distributor

M. F. Blakeslee, RCA Victor's eastern region manager, announces appointment of Bickford of Buffalo, Inc., as wholesale distributor of the company's line of radios, phonographs, records, tubes and television. The organization is headed by Paul and Louis Wolk.

Zenith Policy for Dealers

H. C. Bonfig, vice president in charge of household radio, announces that Zenith Radio Corporation's program of future expansion has now reached the point where it is time for distributors to begin active work on adding strength to the company's already virile and aggressive dealer organization.

Zenith has already decided on a number of fundamental policies: "First," Mr. Bonfig stated, "Zenith is committed to a policy of remaining in the radionics field exclusively. By confining our efforts to the line of business we know, we will render infinitely better service. We intend to continue our policy of distributing merchandise through independent distributors and dealers.

This was announced at a Philadelphia conference with distributors—the fifth in a series of round table discussions which began in Chicago in July. Mr. Bonfig, accompanied by Edgar G. Herrmann, assistant vice president and director of advertising, and by E. R. Taylor, manager of Zenith's sales planning division, had similar meetings in Cleveland, Boston and New York.

Hoffman Radio Readies

R. J. McNeely, sales manager of the Hoffman Radio Corp., Los Angeles, for a number of years, but who became plant superintendent since the war, has returned to his sales post. His immediate work for the organization will be in planning the distribution of Hoffman's post-war lines.

Westinghouse Resumes Radios

Walter Evans, Vice President, announces appointment of Harold W. Schaefer as assistant manager of the newly formed radio receiver division of the Westinghouse Electric and Manufacturing Co., Pittsburgh. He will be in charge of engineering and production under Harold B. Donley, manager of the new division.

As soon as conditions permit, Westinghouse will build and sell a complete line of home radio receivers, including standard receiving sets and frequency modulation, with and without phonograph combinations, and home television equipment. Engineering and development work is already under way on these new models. The company last manufactured home radio receivers in 1928.

Since then, Westinghouse has been active in virtually all other fields of



H. C. Bonfig, vice president, Zenith Household Radio.

radio research, development and manufacture. The radio division at Baltimore and the company's lamp division at Bloomfield, N. J., build basic electronic equipment for broadcasting stations.

Motorola's Trade Plans

The sales management of the Galvin Manufacturing Corp., is now developing complete plans for post-war radio distribution, many of which will soon be announced to the trade. The company will resume the civilian production of a complete line of AM and FM home radio, automatic phonographs, portable and personal radios, standard and specific automobile sets, and 2-way radio telephone systems. Immediately the green light has been given by WPB, Motorola will be in an excellent position for quick conversion, as they have concentrated wholly upon radio manufacture throughout the war period.

Bendix Home Radio Sets

Ernest R. Breech, president, announces the Bendix Aviation Corporation will manufacture and market a line of home radio sets through the Bendix Radio Division, as soon as the military situation permits. Improvements in quality and performance of chassis components, speakers and record-playing mechanisms will be features of the complete line of AM-FM home radio and radio-phonograph combinations, to be manufactured at the Baltimore plant.

Models will be offered to the public at popular prices through selected distributors and retailers. Campaigns in national and local advertising media acquainting the public with the new lines, will begin as soon as the company's war production program is completed. This production includes aircraft radio receivers and transmitters, ultra high frequency and micro-wave equipment, aircraft instrument landing systems, precipitation static dissipators, and more recently adaptations of military models to intercommunication units for railways and municipal mobile equipment.

Mr. W. P. Hilliard, general manager of the Radio Division, believes that the tremendous volume of production for war (which recently reached a \$200,000,000-a-year level) has pointed the way to production of high quality radio equipment at a price well within the range of the average person's peacetime pocketbook. In the meantime, the company is establishing distribution and sales channels to prepare for transition to peacetime production, merchandising and employment.

Stromberg-Carlson Gets Set

Clifford J. Hunt, sales manager of the radio division of the Stromberg-Carlson Co. of Rochester, N. Y., announces the appointment of Frank J. McCloskey as southern region radio sales representative. He will contact distributors and key dealers of the company's lines of radio, F-M and television sets. Mr. McCloskey will also aid in the establishment of area distributorships, opening of key trading areas in readiness for the time when the post-war line is available and supervising the selection, training and assignment of sales personnel.

(Continued on page 6)

Radio Service Dealer



CAMERAMAN TRACKS DOWN A TRADITION

Come war or high water, there is one tradition in the radio industry that continues to stand the test of time! It is the traditional quality for which every Meissner product is famous. With this in mind, our roving photographer recently made another trip to Mt. Carmel, Ill., just to track down the source of this priceless

asset. Part of the answer he found in busy experimental laboratories and in superior manufacturing equipment. But most of all he found it in the skill of workers on the long assembly lines or in the care and pride revealed by every individual Meissner craftsman. Shown above is a typical Meissner production line.



Interesting, intricate are words which might well describe some of Meissner's highly specialized equipment (above and below) but "precision-el" is the one word which fits the company's highly trained personnel.



Father and (right background) son are typical of the way Mt. Carmel families have turned to electronics for lifetime work. Meissner is Mt. Carmel's leading industry.





MEISSNER

MANUFACTURING COMPANY • MT. CARMEL, ILL.
ADVANCED ELECTRONIC RESEARCH AND MANUFACTURE
 (Export Division: 25 Warren Street, New York; cable, Simontrice, New York)

In Trade

(from page 4)

Sprague's New Capacitor Catalog

Dry electrolytic capacitors are establishing new standards of performance on applications formerly reserved for more costly types, and the new Sprague Dry Electrolytic Catalog No. 10 contains compact "Size Factor Tablets" to make it easy to select a capacitor of the proper size, shape, voltage, and capacity, or any desired combination. Types cataloged include cardboard and metal tubulars, cylindrical metal container types, high-capacity low-voltage, cylindrical "FP" types, octal base, A-C motor starting and special purpose types. Application notes include a number of characteristic charts. Copies can be had from the Sprague Electric Co., North Adams, Mass.

Emerson Distributors

Charles Robbins, vice president, announces appointment of Neidhoefer & Co., Milwaukee, Wis., and Auto Equipment Co. of Denver, Col., Dixie Radio Supply Co., Columbia, S. C., and James Supply Company, Chattanooga, Tenn., as distributors of Emerson Radio products in those territories.

Activity on the widely heralded Emerson Radio "P.D.Q." Plan will be instituted by these firms immediately. Under this plan, the dealer issues a preference certificate to the consumer, which helps expedite early delivery of the type of radio set for which the consumer expresses preference when signing the "P.D.Q." Register in the dealer's store. The plan is being utilized by thousands of dealers throughout the country.



Philip M. Pritchard



E. Bruce McEvoy

Tube Catalog

Rex L. Munger, sales and advertising manager, announces a new catalog containing full information on all tubes manufactured by Taylor Tubes, Inc., as well as several new tubes for the ultra and very high frequencies. Catalogs can be had from local distributors free, or for 25 cents to cover mailing costs direct from the manufacturer, 2312 Wabansia Ave., Chicago.

White Star to Utah Radio

Fred R. Tuerk, president of Utah Radio Products Co., announces a White Star Award signifying that the firm has maintained the high standard set six months ago when they won the Army-Navy "E" pennant. Three Chicago plants and another in Huntington, Indiana, are producing radio and electrical equipment for the armed forces.

Sylvania Personnel Changes

C. W. Shaw, general sales manager of the radio tube division of Sylvania Electric Products Inc., announces promotion of Philip M. Pritchard to manager of equipment tube sales for the east central division. The new manager was for eight years a member of the company's radio division sales staff.

E. Bruce McEvoy is appointed assistant to L. S. Raynor, radio tube equipment sales manager for the eastern division. Recently discharged from the army, Mr. McEvoy was formerly with North American Lamp Company and with Ken-Rad Incandescent Lamps Division. Both appointees will work out of the New York office.

Weston Staff Changes

Caxton Brown, president of Weston Electrical Instrument Corp., Newark, N. J., announces changes in the engineering department. John H. Miller is promoted to chief electrical engineer; Frank X. Lamb is his assistant. Karl M. Lederer is assistant director of research, and W. N. Goodwin, Jr., continues as vice-president in charge of research and engineering.

Jobs for Signal Corps Veterans

Wesley M. Angle, president of Stromberg-Carlson Co., Rochester, N. Y., is chairman of the subcommittee on post-war employment problems of the National Association of Manufacturers. In an article published by the Institute of Radio Engineers, he makes the point that today's war-accelerated uses of radio, radar and electronics makes it imperative that the nation's radio engineering-minded youth in the armed forces or at school assume their places in the profession with the least possible delay. These young engineers of recent training must be looked upon as the "new blood" and the potential discoverers of new applications of communications' principles. The field of communications engineering promises to offer richer, fuller and more compelling interests than its sister fields in tomorrow's world.

Aerovox Awarded "E"

For excellence in war production, the Army-Navy "E" Award has been made to Aerovox Corporation, New Bedford, Mass.



H. C. Bonfig, Zenith Radio Corporation's vice president in charge of household radio (right), discusses future merchandising plans with E. L. Davis and Jim Pause of Reinhard Bros. Co. Inc., Zenith distributors in Minneapolis, Fargo and Aberdeen, at a cocktail party given recently for distributors. Gentleman at left scratching his foot thoughtfully . . . is evidently thinking with his "feet on the ground."



F. D. Masters (left) Stewart-Warner radio division manager, examines franchise with G. E. Gunther of Butler Bros., first new distributors appointed to handle post-war line.

General Mills Appoints Imhoff

Harry A. Bullis, president of General Mills, announces the appointment of Roscoe E. Imhoff as sales manager in charge of home appliance sales with headquarters in Minneapolis. The home appliance line is part of the company's Mechanical Division under the supervision of A. D. Hyde, vice president.

The company's plans provide for a line of volume-selling small home appliances, as typified by coffee makers and home mixers, to be sold through conventional trade channels.

With Westinghouse since 1919, where he had last been sales manager of the merchandising division, Imhoff left in 1940 and joined Proctor Electric Company as vice president and general sales manager. With this appointment, General Mills begins to build a sales organization to market its lines of appliances which are expected to be ready as soon as reconversion permits.

Ranges Coming In

A drop in the bucket compared to the estimated demand is WPB's authorization of three manufacturers to produce a total of 5,638 standard, four-burner model electric ranges in October, November and December. They are: Frigidaire division, General Motors Corp., 2,344 ranges; 2,500 ranges from Gibson Refrigerator Co., and 794 ranges from A. J. Lendemann and Hoverson.

These producers are able to meet their quotas without interference with war work. Since standard ranges have not been made for about two years, it is said that production might be delayed by the need for preparing equipment.

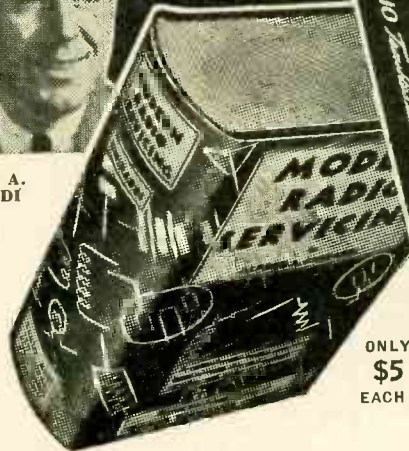
The Government hopes to authorize the production of 88,000 electric ranges for household use this year, or about 16 per cent of the pre-war output. But none of the four-burner ranges will reach dealers until late in the year, and most of them not until early in 1945. Then, only for essential replacements sales.

(Continued on page 8)

These 2 GHIRARDI BOOKS Will help you to Diagnose, Locate and Repair Receiver Troubles EASIER • BETTER and FASTER



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More Money!

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RADIO TROUBLESHOOTER'S HANDBOOK

744 big pages, chock-full of just the kind of time-saving, money-making, tabulated and charted servicing data that servicemen are finding invaluable.

HERE'S HOW TO TEST A RADIO IN 2 MINUTES or less!

Ghirardi's RADIO TROUBLESHOOTER'S HANDBOOK isn't a "study book." It's an on-the-job data book to be referred to in your everyday work. For example, don't waste your time on complicated troubleshooting for every ailing receiver you are called upon to repair! First, look up its model number in the big Trouble Case History Section of the Handbook which lists common troubles and their remedies for over 4,800 models of receivers and record changers.

CHOCK-FULL OF SPEED-UP DATA
Nine times out of ten the Handbook will give you the exact clue you need to repair a receiver at once—often without any testing at all! Similarly, on tubes, parts, replacements, substitutions, color codes, circuit alignment, auto radio, batteries, vibrators, ballasts, grid bias resistors, condensers, transformers, tone controls, filters, etc., etc., you get pages of quick-find, tabulated data to help do every repair job better—AND A LOT FASTER! This big new Handbook that weighs over 4 pounds is yours to use every day to make more money for only \$5 complete (\$5.50 foreign.) Order today!

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PREPARE FOR A BETTER JOB AS A RADIO-ELECTRONIC TECHNICIAN**

Men Trained in Radio and Electronics Now Available Through V. S. C.

Veterans Service Centers Now Placing
Technicians Trained by Army and Navy

New York—Sept. 1, 1944:—Employers seeking the services of trained Army and Navy technicians who have been working on radio, electronic and communications equipment are advised to communicate with:

1. The local draft board; and its Re-employment Committeeman.
2. The local United States Employment Service office. Veterans apply here when they know the work they want.
3. The Veterans Service Center. To this Center go servicemen in doubt about the kind of work they want.

There are thousands of men who knew nothing of radio before the war, who during their term of service were thoroughly trained in the theory and practice of electronic equipment.

During the past three years Rider Manuals and Rider Books have been providing "The Extra Hand" needed to replace radio servicemen who had joined the armed forces. Now, however, men are being released; more will be available with each victory.

Thousands of them are trained radio and electronic equipment maintenance men who can help you turn out the huge volume of work you have in your shop.

But they will need authoritative servicing information if they are to operate at peak efficiency.

Check your Rider Manuals. Do you have all thirteen volumes—a set for each bench? Check, too, the list of Rider Books at the right. These are check full of helpful hints on civilian set maintenance; should be made available to all your new men.

PLACE YOUR ORDER TODAY

Thousands of dollars were spent by the Government in training each of these servicemen. Their knowledge and skill are now available to employers who communicate with the proper Government offices:

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 Volumes XIII to VII.....\$11.00 each volume
 Volumes VI to III..... 8.25 each volume
 Abridged Manuals I to V [1 volume]....\$12.50
 Automatic Record Changers and Recorders 6.00

OTHER RIDER BOOKS YOU NEED

The Cathode Ray Tube at Work
 Accepted authority on subject..... \$3.00
 Frequency Modulation
 Gives principles of FM radio..... 1.50
 Servicing by Signal Tracing
 Basic Method of radio servicing..... 3.00
 The Meter at Work
 An elementary text on meters..... 1.50
 The Oscillator at Work
 How to use, test and repair..... 2.00
 Vacuum Tube Voltmeters
 Both theory and practice..... 2.00
 Automatic Frequency Control Systems
 —also automatic tuning systems..... 1.25
 A-C Calculation Charts
 Two to five times as fast as slide rule..... 7.50

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 On "Alternating Currents in Radio Receivers"—
 On "Resonance & Alignment"—
 On "Automatic Volume Control"—
 On "D-C Voltage Distribution"..... 90c each

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 13 E. 40th Street, New York City Cable: ARLAB

In Trade
(from page 7)

Government to Release Surplus Tube Stocks Through Manufacturers

According to Bob Almy, manager distributor sales, Sylvania Electric Products, Inc., radio tubes are one of the first items in the electronic classification which the government has listed for disposal. Radio tubes were selected because there are relatively few manufacturers and a critical civilian shortage exists.

The first lot of radio tubes which has been declared surplus by the government will soon be released. The exact quantities are not yet known. It is believed that the majority of receiving types can be absorbed quickly in the civilian market, if they are not needed for war orders.

Bob Almy questions if the first tube release will make a sizable dent in the overall shortage condition; and when distributed nationally, will not be particularly noticeable to individual radio service dealers and their customers.

On tube production, reports from the field show that deliveries of "MR" tubes have generally improved during the past sixty days. Certain types such as the 12SA7GT/G and the battery types continue on the "acute" list.

Of the 4,500,000 "MR" tubes scheduled by WPB for the third quarter of this year, it is doubtful if the goal of 1,500,000 per month will be exceeded appreciably. The WPB is reviewing fourth quarter schedules, though, with the view of authorizing additional "MR" production, particularly critical types. Our feeling is that the fourth quarter will see gradual improvement in "MR" deliveries in types and quantities.

(Continued on page 34)

RIDER MANUALS GIVE YOU THE HELP YOU NEED!



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Standardize on

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Transformers

Call your nearest Stancor Jobber...
or write us for his address

STANDARD TRANSFORMER CORPORATION
1500 N. HALSTED STREET CHICAGO



VERY CRITICAL None received by Century for months	CRITICAL A very few received each month. By actual count less than 100 received during (Mar., June or July)	AVAILABLE IN SMALL QUANTITIES These types in quanti- ties sufficient to allow to most customers.	"CATS AND DOGS" These types available in almost any quan- tity.
10A5	10A5	6X4	6X4
10A6	10A6	6X5	6X5
10A7	10A7	6X6	6X6
10A8	10A8	6X7	6X7
10A9	10A9	6X8	6X8
10B6	10B6	6X9	6X9
10B7	10B7	6X10	6X10
10B8	10B8	6X11	6X11
10B9	10B9	6X12	6X12
10C6	10C6	6X13	6X13
10C7	10C7	6X14	6X14
10C8	10C8	6X15	6X15
10C9	10C9	6X16	6X16
10D6	10D6	6X17	6X17
10D7	10D7	6X18	6X18
10D8	10D8	6X19	6X19
10D9	10D9	6X20	6X20
10E6	10E6	6X21	6X21
10E7	10E7	6X22	6X22
10E8	10E8	6X23	6X23
10E9	10E9	6X24	6X24
10F6	10F6	6X25	6X25
10F7	10F7	6X26	6X26
10F8	10F8	6X27	6X27
10F9	10F9	6X28	6X28
10G6	10G6	6X29	6X29
10G7	10G7	6X30	6X30
10G8	10G8	6X31	6X31
10G9	10G9	6X32	6X32
10H6	10H6	6X33	6X33
10H7	10H7	6X34	6X34
10H8	10H8	6X35	6X35
10H9	10H9	6X36	6X36
10I6	10I6	6X37	6X37
10I7	10I7	6X38	6X38
10I8	10I8	6X39	6X39
10I9	10I9	6X40	6X40
10J6	10J6	6X41	6X41
10J7	10J7	6X42	6X42
10J8	10J8	6X43	6X43
10J9	10J9	6X44	6X44
10K6	10K6	6X45	6X45
10K7	10K7	6X46	6X46
10K8	10K8	6X47	6X47
10K9	10K9	6X48	6X48
10L6	10L6	6X49	6X49
10L7	10L7	6X50	6X50
10L8	10L8	6X51	6X51
10L9	10L9	6X52	6X52
10M6	10M6	6X53	6X53
10M7	10M7	6X54	6X54
10M8	10M8	6X55	6X55
10M9	10M9	6X56	6X56
10N6	10N6	6X57	6X57
10N7	10N7	6X58	6X58
10N8	10N8	6X59	6X59
10N9	10N9	6X60	6X60
10O6	10O6	6X61	6X61
10O7	10O7	6X62	6X62
10O8	10O8	6X63	6X63
10O9	10O9	6X64	6X64
10P6	10P6	6X65	6X65
10P7	10P7	6X66	6X66
10P8	10P8	6X67	6X67
10P9	10P9	6X68	6X68
10Q6	10Q6	6X69	6X69
10Q7	10Q7	6X70	6X70
10Q8	10Q8	6X71	6X71
10Q9	10Q9	6X72	6X72
10R6	10R6	6X73	6X73
10R7	10R7	6X74	6X74
10R8	10R8	6X75	6X75
10R9	10R9	6X76	6X76
10S6	10S6	6X77	6X77
10S7	10S7	6X78	6X78
10S8	10S8	6X79	6X79
10S9	10S9	6X80	6X80
10T6	10T6	6X81	6X81
10T7	10T7	6X82	6X82
10T8	10T8	6X83	6X83
10T9	10T9	6X84	6X84
10U6	10U6	6X85	6X85
10U7	10U7	6X86	6X86
10U8	10U8	6X87	6X87
10U9	10U9	6X88	6X88
10V6	10V6	6X89	6X89
10V7	10V7	6X90	6X90
10V8	10V8	6X91	6X91
10V9	10V9	6X92	6X92
10W6	10W6	6X93	6X93
10W7	10W7	6X94	6X94
10W8	10W8	6X95	6X95
10W9	10W9	6X96	6X96
10X6	10X6	6X97	6X97
10X7	10X7	6X98	6X98
10X8	10X8	6X99	6X99
10X9	10X9	6X100	6X100

What every dealer knows: tubes in and out of stock (from Century Radio Co.)

Radio Service Dealer



Yesterday and **TODAY**

The Army-Navy Production Award for outstanding achievement in producing vitally important materials essential to the war effort will be an added incentive to the management and employees of

WARD PRODUCTS CORPORATION to keep producing more and better equipment for the men who are doing the fighting. While yesterday WARD Antennas were accessories for pleasure, today they are implements of War.



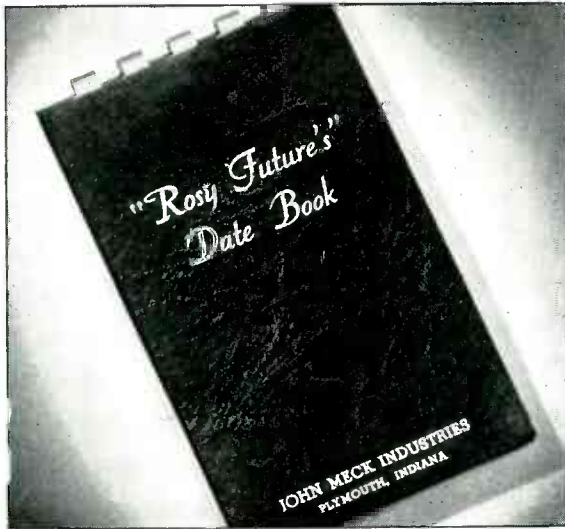
WARD

Antennas

THE WARD PRODUCTS CORPORATION, 1523 EAST 45TH STREET, CLEVELAND, OHIO

WANTED

"HOME ENTRY" AND "CONFIDENCE" WORKERS



BIG OPPORTUNITY FACING YOU

As a result of your knowledge and skill in radio, you are welcome in the homes of your community. Your statements carry weight because your customers have confidence in you. Have you thought what this sales advantage means to your future? To meet that future, when there may be less service work, MECK has planned a line of Radios and Phonographs that are Built to Perform and Priced to Sell. MECK is offering you "Rosy Future's" Date Book—Free—to record the future needs of your present service customers. Send for your copy today. Then — when "Delivery Day" comes, meet those customers' needs with MECK Radios and Phonographs.

Built to Perform — Priced to Sell!

WRITE FOR *Free*
"DATE BOOK" NOW

Pocket size, durable—get started on YOUR post-war plans now. Just write—it's free!



DISTRIBUTED NATIONALLY THRU RADIO PARTS JOBBERS

 **MECK** RADIOS • PHONOGRAPHS
★ ★ ★
INDUSTRIAL SOUND

BUY MORE BONDS—AND KEEP THEM!

JOHN MECK INDUSTRIES, PLYMOUTH, INDIANA, U. S. A.

ADDRESS DEPT. RSD-9

Radio Service Dealer

TUBES and PARTS

Why radio service dealers are hard-up for trade replacements. Peace in Europe will see release of parts for volume business in civilian radio service.

ACCORDING to the findings of a meeting of the Electronics Distributors Industry Advisory Committee held recently in Washington under the auspices of the War Production Board, lines of radio replacement parts will remain standardized in accordance with the restrictions of WPB L-293, which is in effect for the primary purpose of conserving critical materials. Standard lines are now in existence on paper and electrolytic condensers, transformers and choke coils. Standardization of volume controls is not as necessary now as it was 2 years ago when the order was issued. As far as radio and radar equipment is concerned, the bottleneck is in manufacturing facilities and not in materials.

Deliveries of victory line transformers have been, according to reports, very poor, particularly on power transformers. It is believed that the victory line might as well be eliminated since transformers were fairly well standardized anyway. A further objection to the victory line is the lack of a small, 6-volt transformer, which would probably be the largest-selling type. The dimensions of the victory line transformers are too large for the chassis of a table model radio because the line is made to better specifications, involving additional materials such as larger core and more wire.

But some of the restrictions contained in the above order have been relaxed. Condenser manufacturers, for example, have been permitted to use aluminum cans. A similar step is planned for transformers, since producers who request it will be authorized to make specific quantities of their regular transformers for replacement purposes. That does not mean that a special run will be allowed, but merely an increase beyond the quantity for which the company has military and industrial orders. At present it does not appear that much production will be authorized until the fourth quarter of 1944, but by the end of the year the transformer situation should be better. In general, however, the radio industry may be one of the last to be freed from all restrictions.

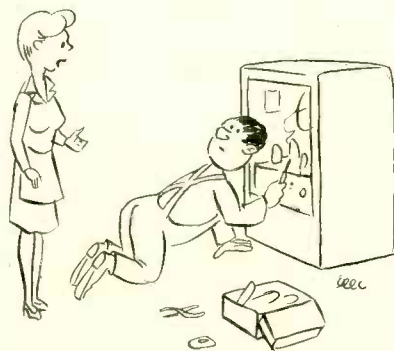
Replacement Tubes

Early this year the WPB began issuing firm production directives on all glass GT receiving tubes. Manufacturers were directed to produce certain quantities of tubes of

each type, marking them "MR" and to interchange a specified number with each of the other manufacturers on a basis comparable to the 1941 inter-manufacturer distribution. Manufacturers have been asked to allocate tubes to their distributors in accordance with their 1941 pattern for the sale of carton-packed tubes. Private-brand lines for which carton-packed tubes are purchased are included in the allocation, but equipment manufacturers who buy tubes in bulk and then repack them are not. Each tube manufacturer has presented a definite distribution plan, which has been approved by the WPB.

But radio service dealers should bear in mind that the peak in war production has not yet been reached in the electronics industry. To meet this year's schedules the industry must produce during the last half of the year at a rate 25 per cent greater than ever before. But in receiving tubes, all military requirements for metals, glass GT's, and locktals should be met during the third quarter.

On the basis of a yearly requirement of 18,000,000 tubes, virtually all civilian requirements should be produced during the third quarter (which ends in September). Since the going rate for the first 5 months has been only 16,000,000 a year, the situation is improving. While the



"Maybe it's clogged with corn, we've been listening to lots of comedians."

Division has given the producers 100 per cent of their material requirements and has not attempted to hold back production in any way, overall production has decreased because of attempts to switch from one type of tube to another. Moreover, even a yearly requirement of 18,000,000 tubes will not satisfy the demand, since 1941 shipments of carton-packed tubes were 33,000,000.

An industry representative estimated that the normal demand for the last few years has been as much as 65,000,000 or 70,000,000. Although the figures published by the RCA license bureau for 1941 were only for 36,000,000 tubes, it is believed that many tubes purchased in bulk have been used for replacements rather than for original equipment. The fact that no new radio sets have been made since 1941 means that demand has substantially increased. In addition production in 1942 and 1943 has met only a fraction of even the 36,000,000 tube requirement.

Tubes For Dealers

Insofar as distribution of tubes is concerned, the point might be made (which RADIO SERVICE DEALER has made time and again) that in metropolitan areas especially dealers are not receiving fair treatment, because numbers of distributors are holding tubes to use in their own repair and servicing departments rather than allocating them to dealers. Because of complaints received from consumers in small markets changes in WPB-547 have been suggested which would rate distributors on their past sales and the factor of population shifts, applied to the total number of tubes actually manufactured. But it is generally believed that no change should be made, and that the present system in which quantities to which ratings were assigned were based only on distributors' past sales, should be given a longer trial. And anyway, many of the complaints are considered unjustified, in view of conditions. If there were sufficient production of a limited number of critical types for one quarter, the problem would clear up automatically.

There are about 20 types of tubes that are the most urgently needed, and except for the fact that the greatest complaint in rural areas has to do with the lack of battery tubes, production of which was stopped by L-76, other complaints are not always so well justified. The loudest protests come often from those who were not in the radio business in 1941 or from dealers who are unwilling to take any stock except the most critical types of tubes. Actually, distributors have been reluctant (to put it mildly) to allocate any tubes to dealers who are entitled to them unless they agreed to buy a lot of extremely slow turnover tubes as well. —L.C.S.



Record Exchange

BUILDS STORE TRAFFIC

WEEKS & DICKINSON have been in the record-merchandising business for over 25 years. The war has changed many aspects of their record-vending business but it has added new and unusual selling methods which are well worth discussing.

Weeks & Dickinson believe that the average defense worker invariably is thoroughly tired after putting in a hard day at a lathe or drill press. Music is the most satisfactory way of giving them a "lift." For that reason, this music dealer sponsors a half-hour weekly radio program consisting of recordings of music requested by defense workers in the

In business 25 years, this record merchandiser makes a "specialty" of variety in discs. "Service Bar" offers special numbers for armed forces. Children are made record-conscious thru clubs

community. Any worker may come into the store and leave the name of his or her favorite tune—classical or otherwise—to be played on a forthcoming program. Names are not mentioned but the recordings

by George Whittaker

are played and the worker recognizes his desired musical number.

Another feature of *Weeks & Dickinson's* wartime program is the establishment of a "Service Bar." This counter features musical recordings which can be sent to boys and girls in the service. Practically every domestic camp has one or more phonographs available and the boy or girl receiving his or her recordings from home can easily arrange to have them played without undue difficulty.

At this counter may be found the "Service Hit Parade," a list of numbers especially popular with servicemen and servicewomen. This acts as a guide to the purchase of records.

In order to especially plug this "Service Bar," *Weeks & Dickinson* recommends a five-minute weekly radio program entitled, "In the Service." On this program news of promotions, transfers, and other happenings of interest to armed forces are mentioned. Naturally, the commercial stresses the desirability of giving records to servicemen on their birthdays, anniversaries, or just any old time.

Nor is this the only "Bar" at *Weeks & Dickinson's*. They have a "School Days" bar in another section of the store where musical recordings of interest to boys and girls from the first grade through high school are featured.

Boys and girls have a special club of their own where they make a purchase of at least two recordings per month. At the end of four months, when eight records have

been purchased, they receive a record absolutely on the house. Selected lists of recordings are made up and a mimeographed copy of the list is given to each pupil in the school system. The list is divided into sections, each section featuring recordings which have particular interest to students of say the first, second, fifth or seventh grades. Teachers are more than happy to give out these lists to pupils because it makes their classroom more musically inclined. It takes but a little time to mimeograph these copies and children are asked to look over the list and talk over the list with their parents.

Weeks & Dickinson realize that the average family is more apt to have a victrola in its home that is not being used than it is a radio. Families are so used to twisting a dial to pick up the radio news that they do not think of the enjoyment to be derived from their phonograph. For this reason, the firm runs a series of newspaper displays pointing out the advantages of phonograph usage. Among the advantages mentioned in the ad are (1) ability to play a tune over again as often as desired; (2) freedom from static or man-made interference; (3) use-

fulness of the victrola to allow children who practice on the piano or some other musical instrument to appreciate the way a real professional plays a certain tune or passage.

Also, they run ads pointing out that by running the phonograph more and the radio less for the duration, scarce radio tubes and other parts may be conserved, for it is a well-known fact, says *Weeks & Dickinson* in the ad, that if a radio gives out, it may not be repaired for some weeks or even months.

The company also promotes a record exchange where possessors of recordings two, three or four years old may trade them for other used recordings. Those having used records bring them to the store to trade them for others which they desire. This department is in charge of a saleslady who concentrates entirely on the recordings from one to fifteen years old. The trades are usually "even-steven," though occasionally money is involved. *Weeks & Dickinson* makes no direct profit—or very little—from this department but it is one of the greatest traffic-builders this store has ever known.



Cover photo, showing actual point-of-sale easel display.

Announced by Ben Abrams, president of Emerson Radio and Phonograph Corporation, the company's new radio program, "You Can't Take It With You," is important to the marketing side of the radio industry as it will be used as a vehicle to publicize the great postwar plan for Emerson Radio dealers known as the "P.D.Q. Plan."

With the P.D.Q. Plan, the dealer gets: streamers for window display, point-of-sale counter easels, a Preference Delivery Quota Register with room for about 150 names on detachable blanks and a stub book of certificates. The customer gets: advice—to register with the dealer right then and there. In three stages the customer is moved along to the final result:

"1. Sign the Preference Delivery Quota Register now. Write in your choice of the type of set you think you will want.

"2. You will be given a Preference Delivery Quota Certificate to keep until sets become available.

"3. Then all you will need do is bring in your certificate and every effort will be made to give you preference in your purchase of an Emerson Radio.

"When civilian production begins it will take more than a year to catch up with the public demand for new

radios. . . . This is not an order. You will be under no obligation to buy. You pay nothing until you have made your purchase. Your Preference Delivery Quota Certificate simply means that you will be assured early delivery of a new postwar radio. . . ."

Dealers are asked to return only completely filled in register forms, direct to the manufacturer, although they may have gotten the register folios through their jobbers.

Naturally, this merchandising plan has attracted many "write-in" applicants. That is, those who have never before been radio or appliance dealers, but wanting to enter the field after the war find the PDQ plan tailor-made to help them break in to what promises to be a gigantically lucrative business. According to Jack Gaertner, advertising manager, the company considers such applicants, with few exceptions, to be sheer opportunists. They are eager to get in on the first "cream" demand, but will drop out when that tapers down to more normal levels. Well established outside retail outlets (such as department stores, or hard goods stores where radios are logical plus lines) may, however, be added to the roster of legitimate dealers where it is warranted by local competitive conditions.

DEALERS REGISTER CUSTOMERS

**Emerson's Dealer support—
P. D. Q.—keeps consumers
"tuned-in" on buying radios.**

The PDQ plan serves more than one purpose:

1. It qualifies the buyers well ahead of time, together with the models wanted.

2. Since the register provides spaces for checking two varieties each of radios, phono-radios and portables, besides "other type" (which customers fill in with "television" "FM" and the like) the company gets a preview of the kinds of models it should put into production first. Some customers have been found to indicate a "full-line" purchase, such as: 3 table models, 1 console combination, 1 3-way radio, 2 personal radios and 1 television set.

3. The column, "price I would pay," gives the company an idea of the range of models that can be most profitably produced for immediate postwar demand. With few exceptions Emerson finds that the prices entered by customers fall within established ranges, so the entries offer reasonably accurate indications of the kind of money the customer actually has for post-war radio buying.

The customary quotas for distributors and dealers are not being set up as yet—too early. But the stir being created by the P.D.Q. plan in the trade, and with customers through the radio program "You Can't Take It With You," is accomplishing a great deal towards making the public radio-purchase-conscious, against the strenuous competition offered by other types of consumer goods.



Advice to worn appliance users in handy booklets arranged for dealer-imprints.

NEW Servicing Plan "KEEPS 'EM WORKING"

by **LEWIS C. STONE**
Managing Editor

A STREAMLINED household appliance service plan designed by General Electric to improve service facilities to the consumer, and at the same time to cooperate fully with WPB's material conservation effort by conserving replacement parts for use only in making essential repairs, is in operation in San Francisco, Boston, Atlanta, New York, New Jersey, Philadelphia and Chicago, with additional locations being planned. A separate service program for radios and combinations is being developed by the radio, television and electronics department of the company.

This operation need not interfere in any way with already well established and smoothly functioning distributor and dealer service facilities. With the aid of local advertising the centers make it easier for housewives to avail themselves of reliable servicing, and it may mean a permanently improved system of appliance service to the public. The way the

General Electric Appliance Service Centers encourage consumers to consult local service dealers. Parts and servicing speeded on major and "traffic" appliances.

Photos courtesy of General Electric



regional service centers may operate will vary with the particular problems and requirements of the areas which they serve.

Some distributors, for instance, (particularly in metropolitan areas) may call on the service centers for parts only. Others will encourage their appliance service center dealerships (qualified service dealers) to make use of the regional centers not only for parts, but also for service facilities over and above the standard services performed by dealers.

Each distributor or dealer within servicing distance of the regional centers will have the advantage of drawing upon a more complete local stock of replacement parts than he might be able to maintain, and he will not be required to have a large investment tied up in parts. Moreover, there will be fewer replacement parts lying unused on the shelves of one regional service center than would be required to fill the shelves of each of several distributors. Therefore, the plan allows a smaller backlog of parts in each region, thus conserving parts and making them readily available to the customers who need them.

Dealer Service Centers

G. E. dealers who are in a position to offer adequate repair facilities in accordance with minimum standards outlined in the plan, are authorized as local G. E. appliance service centers in their communities. Fundamental and refresher courses of instruction are available to the servicing personnel of appointed dealers. Such dealers are required to have the following qualifications:

1. Adequate trained personnel.
2. Adequate stock of supply parts on all products serviced by the dealer.
3. Shop equipped to make minimum standard repairs.
4. Installation and service records.
5. Up-to-date file of service manuals, price lists and catalogues.
6. Handle with courtesy calls for service which he is not equipped to render, which means either sub-letting the job to the nearest qualified shop or directing the customer to one.
7. Identify his store adequately as a headquarters for G. E. service, with decalcomania displays and local advertising.
8. Equip all servicemen with adequate tools.

How It Works

Let's suppose that dealer Jones in Fitchburg, Mass., is the local G. E. appliance service center. He handles a fairly complete line of appliances and can make all of the repairs required in G. E. minimum standards for dealer service centers. A Mrs. Smith comes in to dealer Jones with

a number of G. E. appliances which were broken when a moving van was damaged in an accident. The items include a refrigerator, range, cleaner, fan, clock, and radio.

Jones has on hand the most commonly called for repair parts on most of the appliances. But in the accident, several of Mrs. Smith's appliances suffered unusual damage. Through his distributor Jones orders from the regional G. E. appliance service center (in Boston) the parts he needs for repairs which he is able to make. The parts are shipped the same day if his order reaches the center before 4 p.m., and the parts arrive at the store the following morning. Overnight service is the aim of the regional centers within their coverage.

A few repairs on the range are of major character and they require heavy, expensive equipment. The dealer ships those jobs to the service center. Jones doesn't sell clocks, but he has on hand full information on the repair of Mrs. Smith's clock. He may either sublet the clock repair job to the nearest authorized G. E. clock repair shop, or he may tell Mrs. Smith where to take it, depending on circumstances.

Jones can handle Mrs. Smith's radio, as he happens to be a qualified G. E. radio service shop, besides being the local appliance service center. If this were not the case, he would sublet the radio repair job to another qualified G. E. shop.

Rebuilding of sealed refrigerator units requires factory equipment,

and this job is too big even for the regional appliance service centers. This kind of job is handled by five G. E.-owned factory rebuilding centers in operation in Long Island City, N. Y., Cleveland, Schenectady, Kansas City and San Francisco.

Following the principle of "restored service" only for the duration, G. E. is asking its qualified local service centers not to sell parts unless the parts are necessary for the operation of an appliance. Every effort will be made to prevent a run on parts. No consumer will be encouraged to keep on hand spare parts, for only by using such parts judiciously can essential "restored service" be maintained.

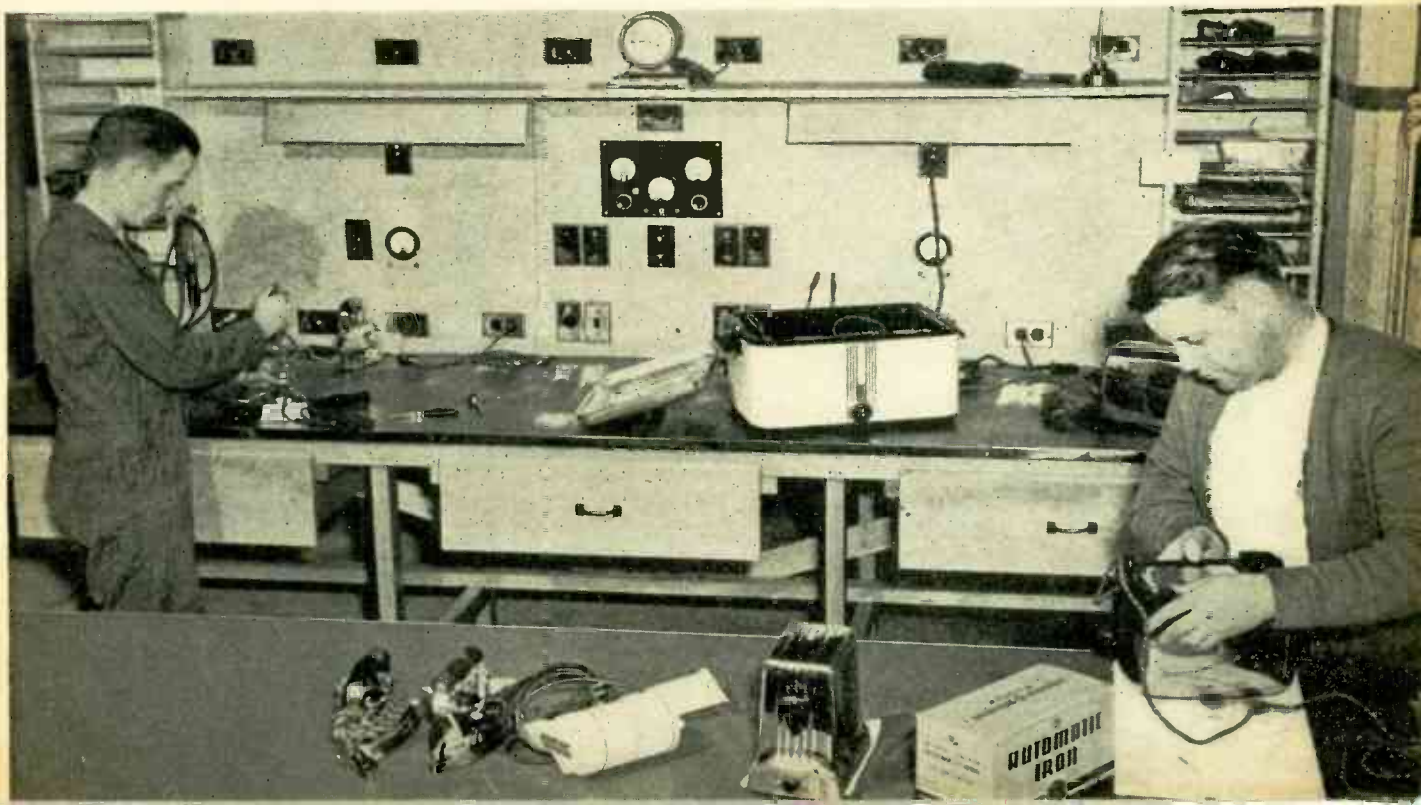
Dealer-Helps

Compact folders and a booklet intended for appliance users, giving common-sense suggestions for keeping appliances in good working order are distributed to dealers for use in conjunction with the service program. In preparing these leaflets (see illustration) G. E. enlisted the aid of home service editors of national magazines, advertising managers of several central stations and housewives themselves. This pre-tested literature is designed to help customers avoid making unnecessary calls on the service dealer and, on the other hand, to encourage service calls in place of amateur tinkering when such a call is advisable.

The policy is to have the customer bring the smaller appliances to the

(Continued on page 30)

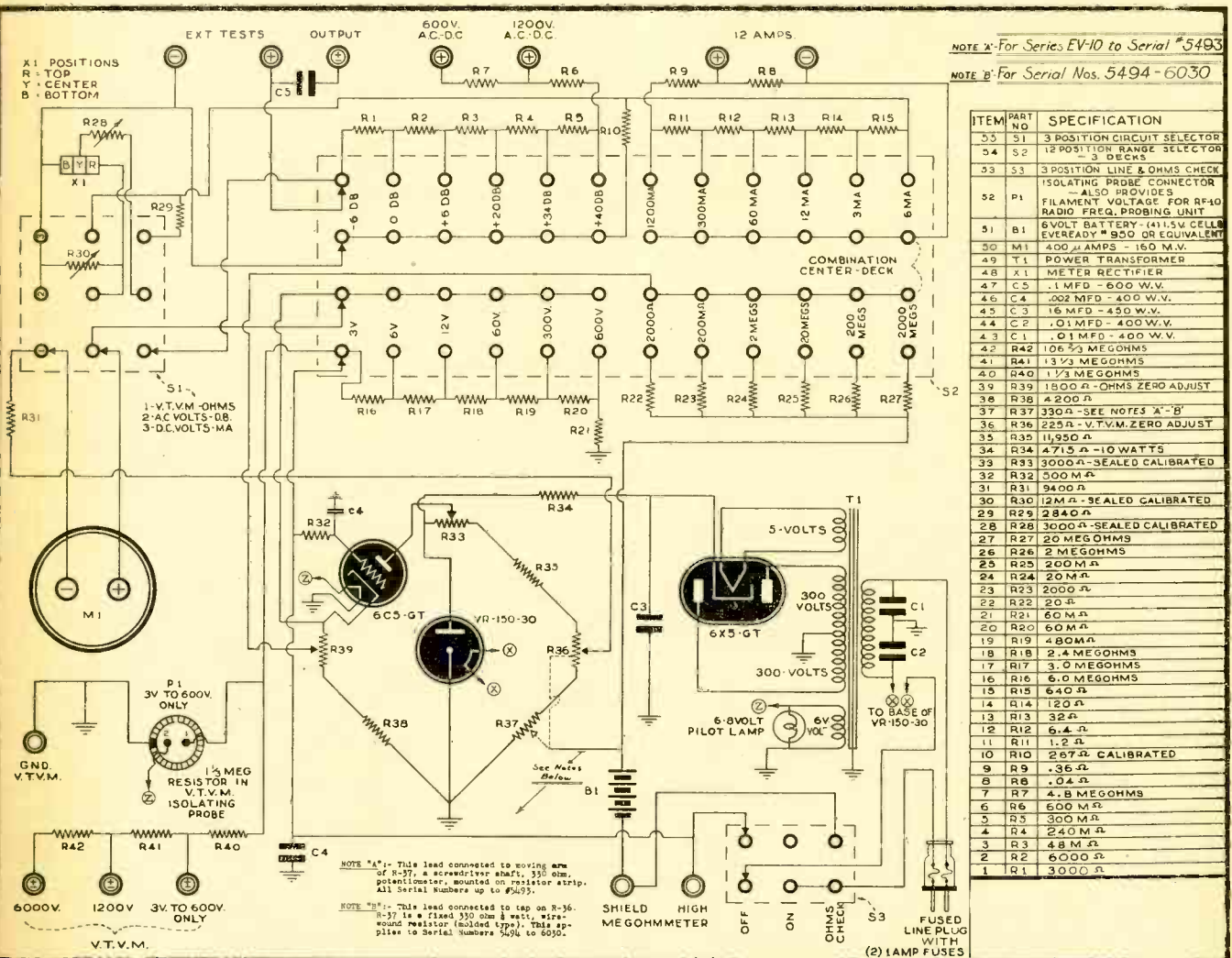
In "handbag" folders the consumer is urged to "call your dealer for service." Below and on facing page, expert appliance servicemen at work in one of the new G.E. appliance centers. Each center serves as a pool of hard-to-get replacement parts and also amplifies repair facilities of service dealers.



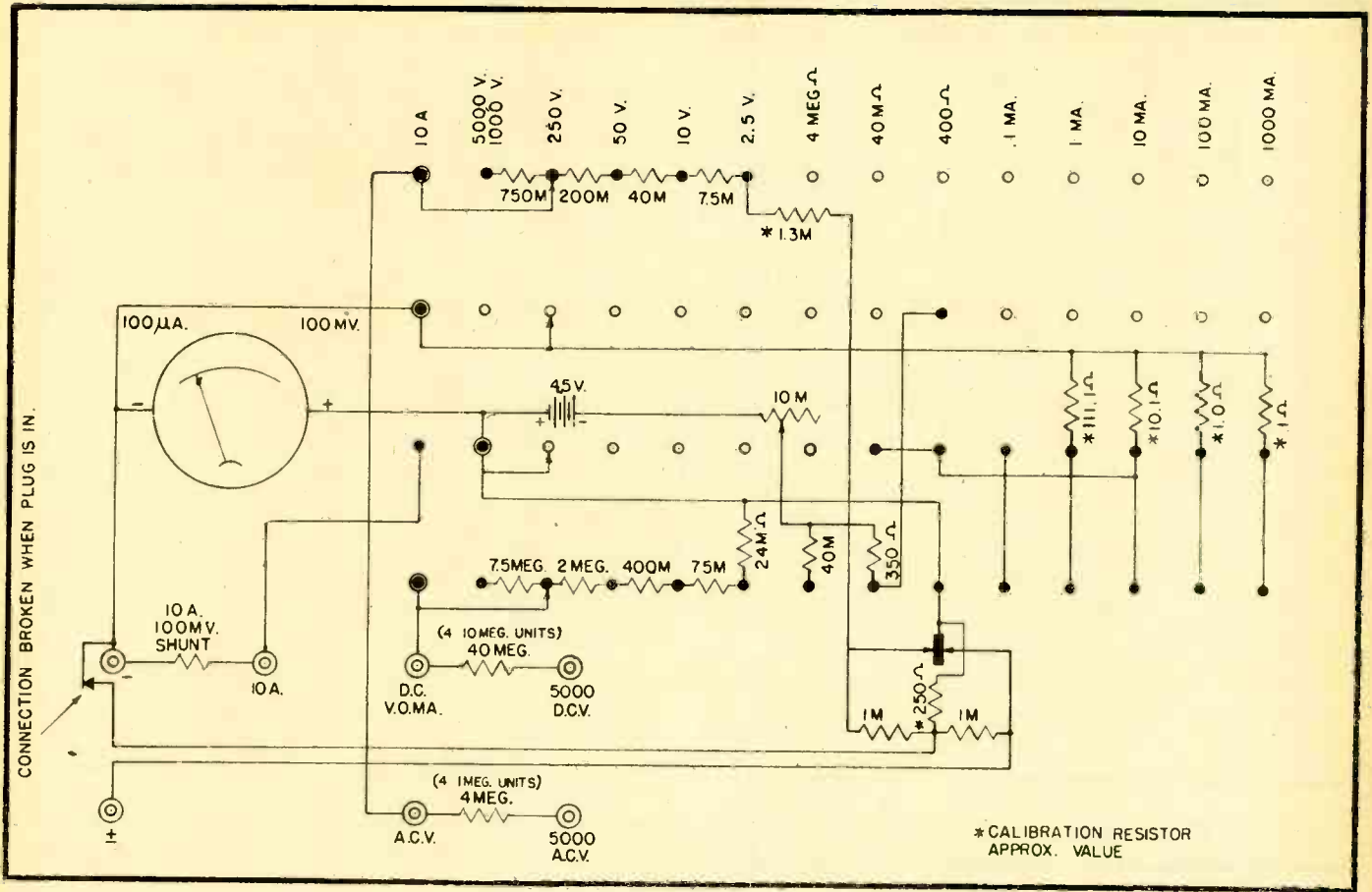
Technical Service Portfolio

TEST EQUIPMENT CIRCUITS-Part I

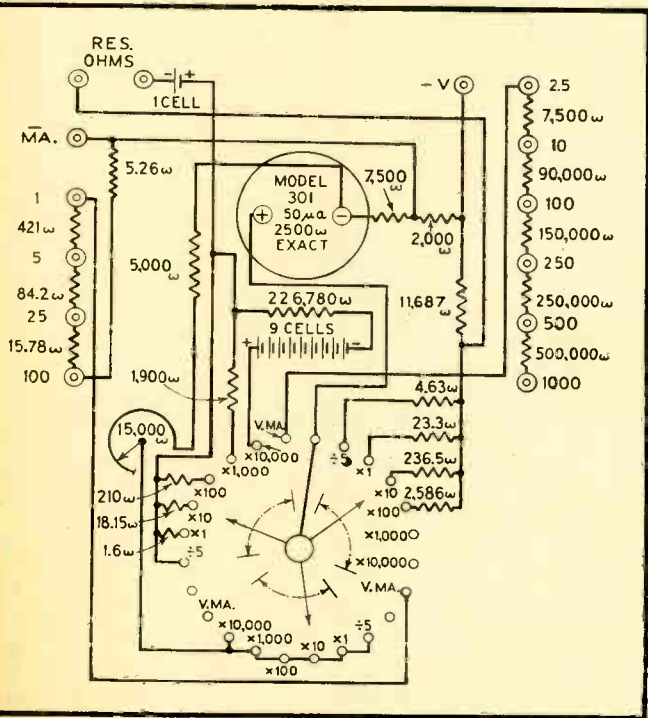
Through the cooperation of test equipment manufacturers we are publishing a series of hitherto unavailable schematics of their instruments. The circuit diagrams will be published without technical comment in a series of "Portfolios" of which this is the first. Subscribers desiring publication of circuits for specific instruments should write to Editor, Radio Service Dealer, for issue priority.



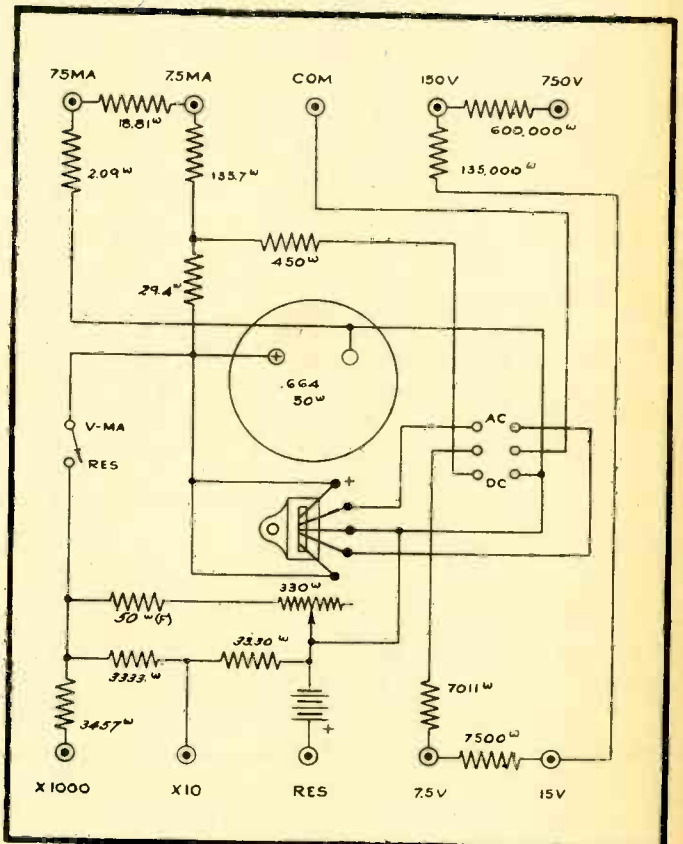
Precision Apparatus Co. Vacuum Tube Multi-range Tester, (Series EV-10).

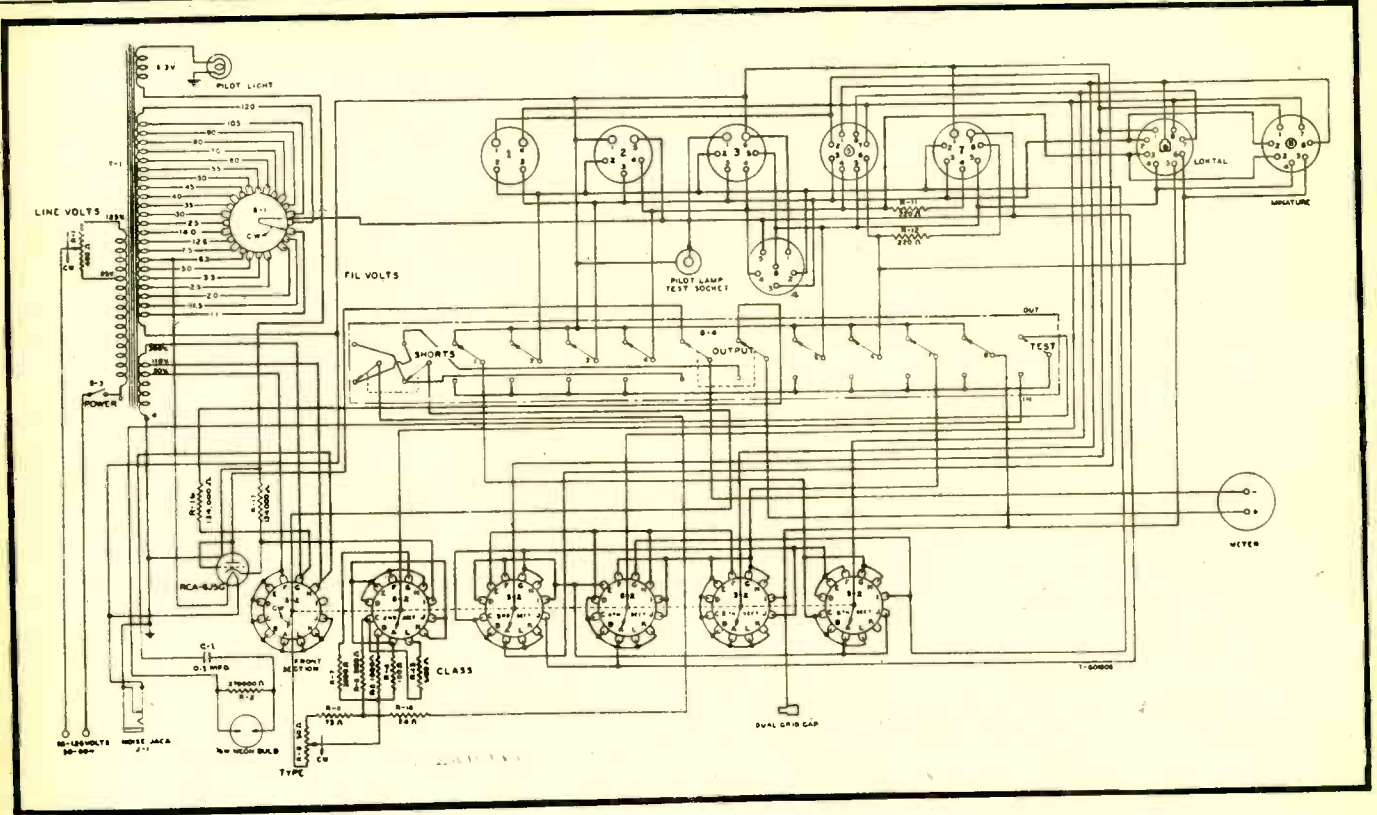


Triplet Electrical Instrument Co. Wide-Range Portable Volt-Ohm-Ammeter, (Model 625-7).

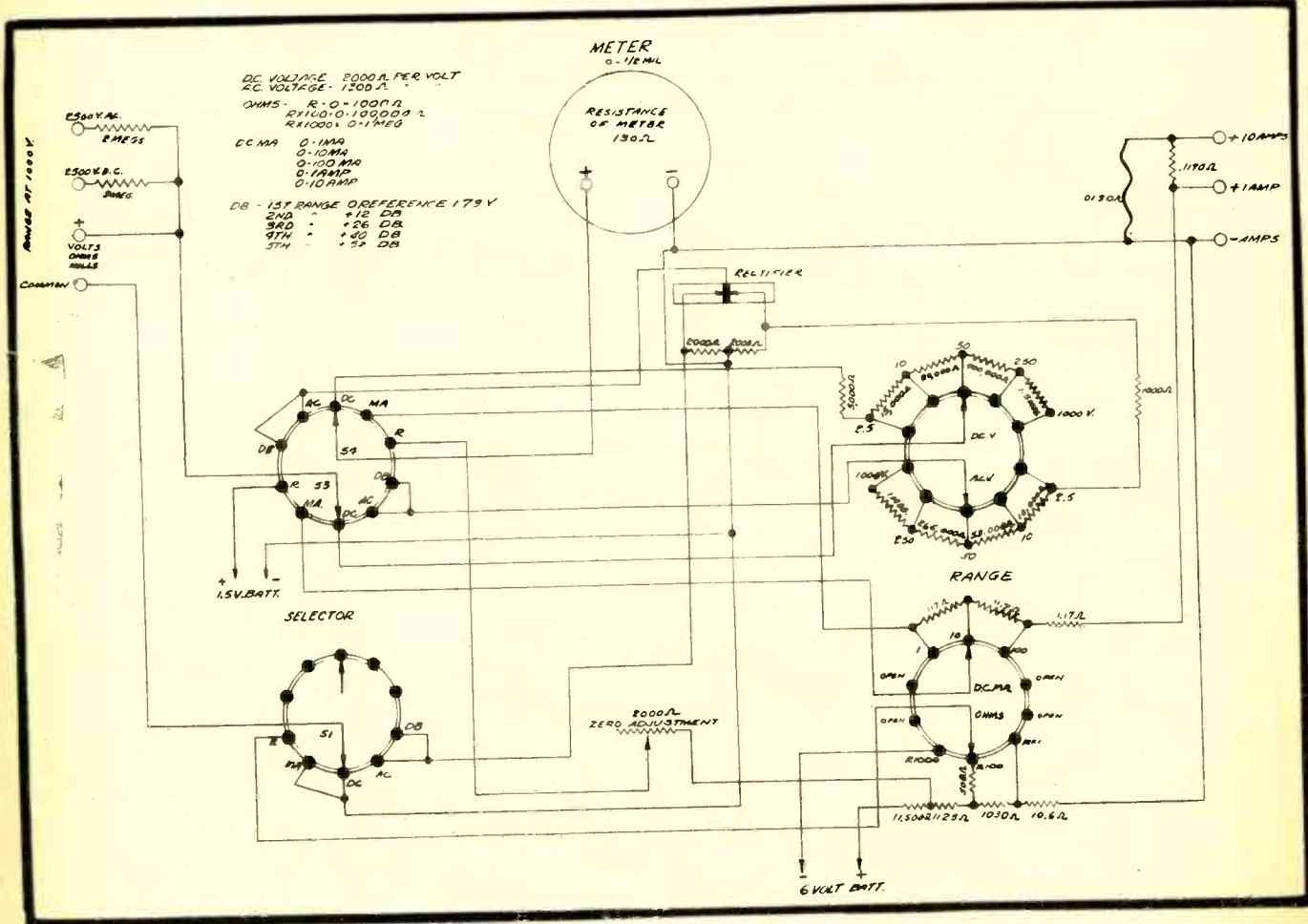


Weston Electrical Instrument Co. (above), 0-1000 volt D.C. Volt-Ohmmeter, (Model 663). Right: Weston 1000 Ohms-per-Volt ac/dc Volt Ohm-Milliammeter, (Model 697).





RCA Tube Tester (Stock No. 156-D portable; No. 156-E counter type). Below: General Electric Co. Unimeter, (Model UM-3).



CARD 1

STROMBERG CARLSON 10 AND 11

The Stromberg Carlson 10 and 11 use special interstage audio transformers to couple a screen grid detector to a pair of 45 grids. A hum balancing arrangement requiring a split secondary is used. Under present conditions a replacement transformer of that type may not be obtainable, but a substitute can be used if the hum bucking circuit or balancing arrangement is changed slightly. The centertap of the secondary is connected to B- and a 25 ohm wire-wound potentiometer is used for balancing. If the hum is very loud, additional capacitance can be added to the filter system. The value required can be determined by experiment on individual

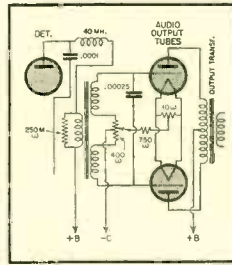


Figure 1.

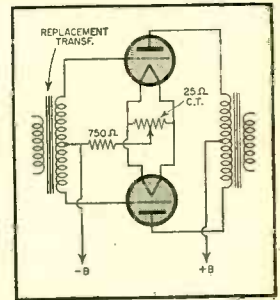
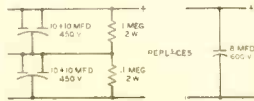


Figure 2.

sets of this type. The original circuit is shown in Fig. 1 and the modification in Fig. 2.

Submitted by Willard Moody

CARD 2



SERIES CONNECTION OF ELECTROLYTICS

When connecting electrolytics in series, choose capacitors of the same voltage and capacitance rating and parallel the capacitors with an inter-connected resistance voltage divider in order to insure equal distribution of voltage

between the capacitors. The resistors should be of the fixed composition type with a resistance tolerance of not greater than 10 per cent. Make sure that the wattage rating of the resistors is high enough to provide an adequate safety factor against damage from overheating. A typical arrangement used in replacing an 8 mfd., 600-volt peak, wet electrolytic by two 10 plus 10 mfd., 450-volt units is shown in the diagram.

Courtesy, Solar Capacitor Sales Corp.

CARD 3

ZENITH 10B1; 10B2

Set is dead on manual broadcast, otherwise OK. Trouble is usually in fixed compensating condenser in automatic tuning assembly which may be grounded to set frame. The remedy is to remove the assembly cover and dress bare lead away from the frame.

—From Zenith Service Hints

CARD 4

REPLACING WET ELECTROLYTICS AND HIGH SURGE DRY ELECTROLYTICS

Properly installed miniature size capacitors can replace wet and high surge voltage dry electrolytics in practically all receivers. To insure satisfactory operation, the circuit surge voltage must not exceed the surge peak voltage of the replacement capacitor (525 volts for 450 volts working). In many cases this means series connection of replacement capacitors.

To determine the circuit surge voltage, temporarily replace the faulty unit by a 1 or 2 mfd., 600 or 1000-volt paper capacitor. Then connect a 1000 ohms/volt or higher

resistance voltmeter across the capacitor. Watch the meter pointer as you snap the set switch. The surge voltage is the voltage at which the pointer hesitates after its first swing before beginning a relatively slow decrease to operating voltage as the set warms up. This test should be made with the highest line voltage which may occur in the location where the set will be used.

If the surge voltage is too high for a single miniature unit, connect units of the proper capacitance and voltage rating in series to serve as the replacement.

Dry electrolytics with a capacitance as low as two-thirds of the original capacitance will usually be found satisfactory when replacing wet electrolytics.

Courtesy, Solar Capacitor Sales Corp.

CARD 5

FORMULA FOR SOLDER

In replacing bypasses and filters in older models of Majestic and Grunow radios, I find that practically all of them were made of tin foil. By saving this tin foil and melting it down and then mixing it with clean soft lead in the proportion of 6 parts tin to 4 parts lead. I obtained excellent solder for radio work. I cast the solder into sheets 1/16-inch thick and cut it into narrow strips. It should be used with soldering paste. Care must be taken not to overheat or burn the solder while melting it.

Submitted by E. C. Entler

AUTO RADIO SNAGS

If the noise of the motor is heard only when the cowl antenna is above the roof level of the auto, place an .00008 condenser between antenna and ground.

If the set reception fades while in the car, but checks favorably on bench test—mere alignment will not help. Replace the 0Z4 tube and the fading usually will be cured.

Submitted by Leon Stein, Mount Vernon, N. Y.

CARD 6

EMERSON FU427

To correct a bad howl when the volume control is turned down, replace the 40 mfd. 25-volt condenser which is mounted below the main filter. Intermittent operation may be caused by a defective main filter (20-20-150).

Submitted by Spears Radio Service.

The MULTI-TESTER

by OSCAR E. CARLSON

HOW multi-range meters are designed, constructed & operated.

PART I

ELECTRICAL instruments, or meters, are older than the electron theory and come from a long chain of inventions. The inventor of the dial and pointer, so prominent on early sun-dials, is lost in antiquity. Springs and jewels are of more recent development. The Nuremburg Egg, a watch, used a mainspring and was made in about 1500 A.D. by Peter Hele, of Nuremburg.

A patent was granted to three English watch makers in 1704 for "jewels to pivot holes of watches and clocks." The inventor, Nicholas Facis, was originally a native of Switzerland.

The D'Arsonval, a moving coil permanent magnet type of instrument, had a succession of evolutionizing developments from 1850 to 1888, when Weston gave us the modern instrument which has seen little basic change since then.

To understand more fully the use of the instrument which is the foundation of nearly all of our modern "Multi-Testers" and D.C. instruments, we must first review some fundamentals.

ELECTRIC AND MAGNETIC FIELDS

It is common knowledge that the earth revolves around the sun because of the pull of gravity. This gravitation is a field of force, or sphere of influence, attracting the earth to the sun, even though no physical bonds connect them.

You will remember that a simple two-plate capacitor, or condenser, has a difference of potential between the two plates when charged. This difference of potential manifests itself by a dielectric field of force, often called the "electro-static field," or "electric field." This field is visualized as dielectric lines radiating from the plates of the capacitor through the dielectric which contains the charge. In drawings, the number of

lines indicate the field intensity. Arrowheads on the lines are used to indicate the direction of the field. This is the direction in which a small, positively charged body would be moved if placed within that field. This is shown in Figure 1.

Figure 2 illustrates the direction of the lines of force for three conditions. Part (a) shows the lines of force around both a positive and a negative charge; part (b) shows the lines of force between two adjacent but oppositely charged particles; part (c) shows the lines of force between two adjacent but similarly charged particles.

An impressed voltage always produces an electric field proportional to the voltage strength. *What we then term voltage may be considered the manifestation of an electric field.*

We are all familiar with the fact that a "magnet" can attract a piece of iron or steel through space. There must then be a field of force between the magnet and the iron or steel attracted to it. We call this field of force the "magnetic field of force," or more simply the "magnetic field."

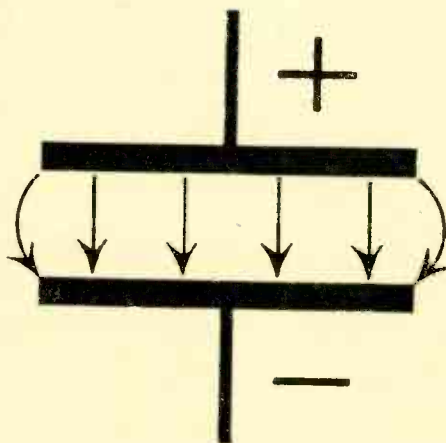


Figure 1.

We have also seen that an impressed voltage always produces an electric field that is proportional to the impressed voltage. Now, a flow of current always produces a magnetic field, the strength of which, in air, is proportional to the strength of the current.

Fundamentally, what is termed voltage is there only because the electric field manifests itself as voltage, and perhaps what is called current is there only because the magnetic field causes a phenomenon that has been termed current. Strictly speaking, electric energy is not carried by voltages and currents; it is carried by the electric and magnetic fields in which the energy is stored.

We have learned that a moving electric current sets up a magnetic field. In Figure 3 are illustrated the magnetic lines of force around a wire which is perpendicular to the printed page and through which electrons are flowing from the rear of the page toward the front. When two wires are side by side such that electrons, or current, through one move in the opposite direction from the other, the resultant magnetic lines of force are as shown in Figure 4. Here the current is flowing from the back of the page through the wire labeled (—) and back to the rear of the paper through the wire labeled (+). Current flow is herein taken to be the same as electron flow, from negative to positive.

If we now take a wire carrying an electric current and form it into a helix, we will have what is termed a coil, or inductance. The lines of force will then be concentrated as shown in Figure 5 so that the coil becomes an electro-magnet with a north and a south pole. It is to be remembered at this point that like magnetic poles repel each other and unlike magnetic poles attract each other.

When a wire carrying current lies in a magnetic field, the wire experiences a force tending to push it out

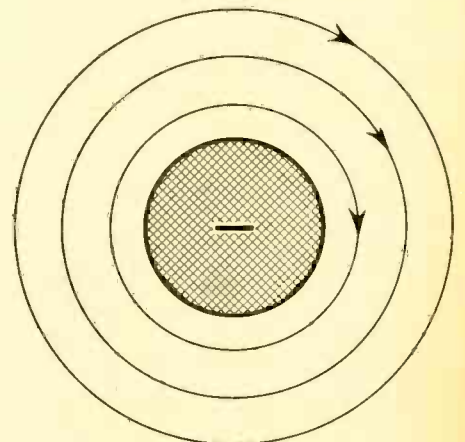


Figure 3.

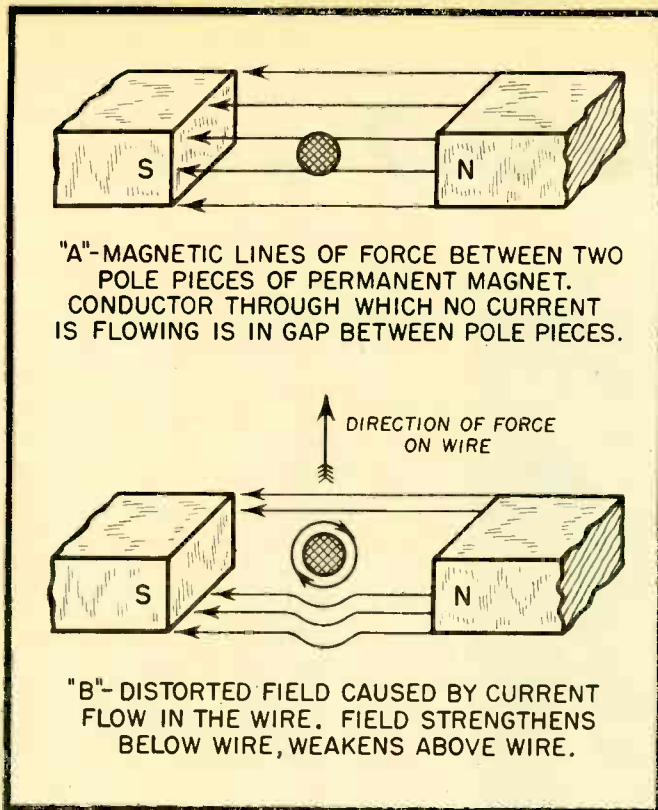


Figure 6.

of the field. In Figure 6.(a), a wire perpendicular to the page lies in a magnetic field between the pole pieces of a permanent magnet. No current is flowing through the wire and the magnetic field is undisturbed. In Figure 6(b) electrons are flowing through the same conductor from the rear of the page. Then a magnetic field is set up about the wire as indicated and the resultant field within the areas bounded by the pole pieces of the permanent magnet will be distorted. On the

bottom of the wire the fields of the magnet and the wire are in the same direction and thus add together. On the top side of the wire they are opposing each other and thus tend to weaken the field in that direction. The wire will thus tend to move upward in the direction indicated by the arrow.

If this wire, in coil form, were now pivoted so it could not move out of the field, a torque would be applied to it, tending to rotate it within the field. Figure 7 illustrates

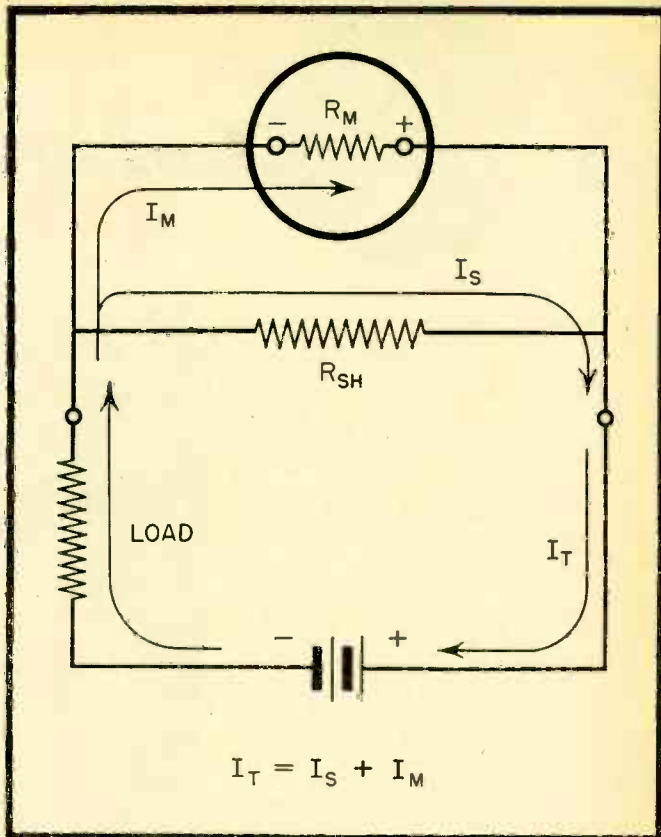


Figure 10.

such an arrangement where the coil makes up an electro-magnet which may rotate no more than 180 degrees, for at that point unlike poles of the magnets would face each other.

The amount of motion imparted to the pivoted coil is proportional to the strength of the opposing fields or to the strength of the current flowing through the coil. We have here then a current-indicating device which may be made into the conventional D'Arsonval type D.C. meter, with the addition of jeweled bearings, pointer and dial, and spring tension to limit the angle of rotation. Figure 8 shows this arrangement.

The reader is aware that the wire making up the meter coil offers some resistance to the flow of current and consequently there is a voltage drop across the coil. A meter is so designed that for full scale deflection value of current the resistance of the meter is small compared to the circuit resistance so that insertion of the meter in the circuit does not appreciably alter circuit conditions.

To measure current flowing through a circuit, that current must flow through the meter. Consequently the meter to measure current is always placed in series with the other circuit elements. This is shown in Figure 9.

Now let us suppose that with a meter designed so that the current for full scale deflection is 1 ampere,

(Continued on page 26)

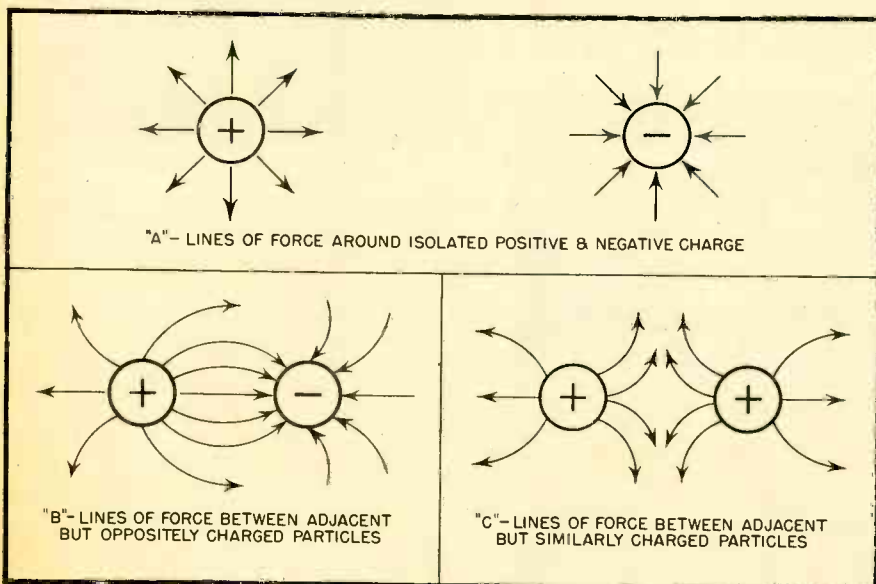


Figure 2.

DISCussion....

Records and Record Makers by L.C.S.

Young stars are coming in . . . Martha Stewart, radio and pix singer . . . David Street, tenor in radio's Joan Davis-Jack Haley "Village Store" program . . . both, to Victor. Discaster Dinah Shore . . . in London, import pin-up by request of the boys abroad. Army Service Forces Music Section has Perry Como recording his air program . . . "For the Record" . . . on "V" discs for overseas shipment. Lena Horne takes them over at Chicago's Chez Paree . . . and many a tune is jazz arranged for her by Fletcher Henderson's brother Horace . . . her arranger and music director. Blue's "Music America Loves Best" takes on more jazzo features . . . Mel Henke pianos and Adele Girard harps for the public . . . following the recent Duke Ellington and Cozy Cole discs. . . orchestra and chorus by Jay Blackton. Spike Jones spiked chimes with cowbells in his antique grandfather's clock . . . not enough spirit to ordinary chimes . . . now Spike is happy every hour on the hour.

Duke Ellington . . . was thieved-out of five saxes, five clarinets and a trumpet while in Canada . . . on last day manager Al Calley got a phoneful about the whereabouts of the wherewithals—and found them safely right outside the door. Vaughn Monroe and his band get a new chirp while on at the Million Dollar Pier in Atlantic City . . . Marilyn Duke, replacing Del Parker. Spike Jones puts a spoke in his own wheel . . . released by Bob Burns to program on his own . . . with the City Slickers,



Gloria de Haven, from pix "Step Lively" which features Frank Sinatra, singing "And Then You Kissed Me." Who did whom?

of course. Tommy Dorsey's success album . . . names he helped make . . . Frank Sinatra, Jo Stafford, the Pied Pipers, Connie Haines, others . . . in "Tommy Dorsey, Starmaker" (Victor). Dinah Shore writes her experiences with the armed forces . . . for army hospital publications, by request. Bonds and Ties went over big for Sammy Kaye . . . Sam's tie was auctioned off in front of Times Square's cash-registered Fifth Loan drive . . . fetched a cool \$1,000 . . . for which Sammy offered the bid-

der choice of his 350 cravat collection. . . . Kaye will also give away 500 autographed batons to promote war bonds . . . it's his famous "So You Want to Lead A Band" theatre stunt.

Dinah Shore . . . entertains servicemen somewhere in Europe . . . and returns in time to start her new NBC spot in October. New recorder Martha Stewart . . . in first "Music America Loves Best" NBC show, with Sigmund Romberg . . . Future shows will have top pop-discers Vaughn Monroe, Duke Ellington, Dinah Shore, Charlie Spivak, Lena Horne, Mel Henke and David Street . . . this is a sho-sho show. Gene Krupa, the beat-all drummer, with band . . . to pix for RKO. Paul Baron will air-debut Phil Moore's cross section



Ginny Simms . . . Sings



Mister Jimmy (Inka Doo) Durante t'rows up his hands for mamas, pistol-packin'.

sketch of musical America today . . . "Species Americana." Freddy Martin . . . back in Cocoanut Grove, Los Angeles, with band.

Fred Waring is Roxying in New York . . . Jerry Wald is at Paramount, same place . . . Russ Morgan is in Berkeley, Cal. . . . Glen Gray performs in Denver. Shep's new field piece is swing-tune he calls the "Copa-Boogie." . . . That's copa-aing with the situation, eh?

Records to Sell

RCA-Victor:

Vaughn Monroe and his Orchestra (20-1591) in "Hawaiian Sunset," written by Sammy Kaye and sung by baritone-leader Monroe. Coupling is a com-

SPRAGUE TRADING POST



A FREE Buy-Exchange-Sell Service for Radio Men

The ONLY Resistors wound with *CERAMIC INSULATED WIRE!

- * FLEXIBLE
- * MOISTURE PROOF
- * HEAT-PROOF TO 1000°C.
- * LARGER WIRE SIZES IN LESS SPACE

As a radio serviceman, no one has to tell you that a wire wound resistor is no better than its insulation—or that that is why Sprague Koolohm Resistors are "tops" by any test you care to name. Koolohm ceramic insulation is applied directly to the wire and the assembly is then DOUBLY protected by an outer ceramic tube. Koolohms operate so cool you can use them at full wattage ratings. They are highly resistant to both moisture and heat. They give you higher ratings in smaller sizes. KOOLOHMS will not let you down!

FOR SALE OR TRADE—Superior 1230 AC sig. generator with audio frequency, in portable metal case; 200-watt, 60 cycle AC generator for mobile sound systems or AC equipment; 0-1 100 ohm DC milliammeter; 0-5 Weston DC voltmeter; Webster theatre type 15 watt sound system. Want 35 MM films, sound preferred, all subjects; also record changer, any condition. J. L. Orysen, 1460 S. 108th St., Milwaukee 14, Wis.

WANTED—Low power phono-C.W. Transmitter, 50-100 watts. Also Jensen 10" P.M. speaker. Lt. John H. Parrott, Box 288, Shaw Field, S. C.

WILL TRADE—240Z4 for 12 series, 35 series, 50 series, or what have you? Woolf Radio Service, 389 O'Farrell St., San Francisco 2, Calif.

WANTED—Radio City 310C tube tester or equivalent. \$25 top price. W. B. Cox, Rt. #3, Anson, Texas.

FOR SALE—Universal 8 MM camera in original box, \$10. Want new 12v. tubes or higher; also N.G. phono crystals—must be in one piece. Stein, 7 Monroe St., Mt. Vernon, N. Y.

URGENTLY NEEDED—25B5 tube; also tube tester to handle all tube types. Leyden Radio Sales & Service, 9651 Franklin Ave., Franklin Park, Ill.

WILL TRADE—117L7 tube for urgently needed 12K8. A/C Robert F. Chambers, Class 44J—Major's Field, Greenville, Tex.

FOR SALE—2 Weston meters—#301 0-5 voltmeter, and #506 0-30 milliammeter. Gerald VanAusdal, 320 West Vine street, Oxford, Ohio.

WANTED—Superior multimeter #1250; also #1230 sig. generator. Ed. Madden, Box 11, Montrock, Ontario, Canada.

URGENTLY NEEDED—3-1 Push pull audio transformer; also 25A7, 12A7, 35Z5, 35Z4, and 35Z3 tubes. F. M. Crawley, AHT 3/C, U. S. Natto, Bks. #2, Ward Island, Corpus Christi, Texas.

FOR SALE—Supreme 571 sig. generator. \$45; Supreme #585 diaphragm, \$50; VTMV, \$55; output meter with 8" Weston, #14 meter, \$25; Superior #1280, \$21; 150 new tubes at list; Gen. Industries phono motor and 12" table, 78 R.P.M., 60v, new 320. Crooks Radio Service, Box 94, Keat, Ohio.

URGENTLY NEEDED—Battery eliminator to test 1.5 v. battery radios on 110v. A.C. current. Carl W. Wells, Radio Shop, Frost, La.

FOR SALE—Paper and mica condensers, resistors, volume controls, transformers, N.R.I. course, 30 books, power pack power xformer, 2" speaker tubes. Gene Lesko, P. O. Box 510, Bristol, Penna.

WANTED—Hallcrafters SM-20R carrier level meter. Roger D. Lane, Mansion House, Greenfield, Mass.

WANTED—A1 electronic V-O-M or 25,000 ohms per v. multi-tester, for cash—or part cash and a few hard to get tubes such as 12SA7, 12A8, 35Z5, etc. or new Shure crystal microphone. D. Bowen, 435 S. Rampart Blvd., Los Angeles 5, Calif.

URGENTLY NEEDED—1LA6, 1LB4, 1LN5, 1LH4 tubes; also 2 1/2 meter transcriber, and old Confidence tube checker. Benjamin Peyton, 3306 Arch St., Little Rock, Ark.

FOR SALE—350 good used tubes, many popular types 25c each. Minimum order \$3.00. Specify second choice. Also new stranded rubber covered twisted transmission wire for all wave receivers, \$1.50 per hundred feet. Send no money with orders until acknowledged. Baldwin

Radio Service, 13 Fulton Ave., Jersey City 5, N. J.

WANTED FOR CASH—Sweep frequency modulator, for use with RCA #155 oscillograph; also 35Z4-5 or 6, 35L6, 50Y6, and 50L6 tubes. Can trade other tube tubes, also RCD #308 portable tube tester with all sockets. J. J. Schwarz, 1366 Greenleaf Ave., Chicago 26, Ill.

WILL SWAP—Almost new 6.3v-5r-600-0-600v 200 mil. transformer for a 475-0-475v transformer with same filament voltages. Must be perfect. Will trade 30 caliber pre-1900 German Mauser semi-automatic pistol. Want SX-24 or SX-25 or similar receiver. Frank Williams, W6LUE, 748 Glenview Road, Glendale 2, Calif.

FOR SALE—Clough Brenkle oscilloscope #CRA and sig. generator OM. Both perfect with instructions and charts, \$110. M. R. Wright, Box 861, Rawlins, Wyo.

WANTED—Up-to-date tube tester and condenser analyzer. What have you? Radio Electric Appliance Co., 111 East Main St., Lancaster, Ohio.

WANTED—Multi-match 40-watt transformer. Thord. T17 M59 or T11 M74, or any modulation trans., crystal or magnetic cutting head. Joseph A. Stauchs, 159 N. 15th St., Bloomfield, N. J.

WANTED—1935 Superskyrider; must not have any damaged components. Also, '37-'38 RSR Super Clipper, 7 tube pre-selector model. M. P. Kelley, Church St., Granville, N. Y.

FOR SALE—RCA oscillograph, TMV 122-B; RCA frequency modulator TMV 128-A; RCA test oscillator #TMV 97C; Weston tube checker, #770. Chas. E. Gravel, 158 Charlton St., Southbridge, Mass.

FOR SALE—Tubes—send for list. Want E-200 Precision sig. generator in A-1 condition; also jr. or senior RCA voltmvst. Ward Lantis, 111 Shelby St., Kingsport, Tenn.

FOR SALE—Brand new Motorola FM converter; also Hallcrafters recorder SX 28 and Jensen 12" speaker and base reflex cabinet—both perfect. Shumaker and Evans, 6 Washington Square, Newport, R. I.

WANTED—Efficient, moderately priced tube tester. John W. Butler, 424 Mansfield St., Belvidere, New Jersey.

WANTED—Old radio, not necessarily in working condition, but must be complete. Also tubes as follows: 11F5G, 1F5GT, 1A7G, 1N5GT, 1H76GT/G, 35L6, 35Z5, 12SQ7GT, 12SK7G, 12SA7G, 9002, 9003. Frank Ura, General Delivery, Gooding, Idaho.

FOR SALE—Starrett 6" Vernier calipers, linear and metric scales, case \$25; almost new. Want Hickok 202 AC-DC V-O-M or Jr. VoltOhmyst #165. W. MacFarlane Jr., 1133 Palma Ave., Schenectady 6, N. Y.

WANTED—Good sig. generator and tube tester. I. Rosenstreich, 1667 Washington Ave., Bronx, New York.

WANTED—Rider's Manuals VI - VIII - IX - X. General Appliance Repairs, 613 N.E. 1st Avenue, Miami 36, Fla.

FOR SALE—Unused Billey VF1 crystal, 3558.5 Kc with polystyrene socket, \$5; brush watch case crystal mike with shielded lead and Amphenol 3 pr. metal connector, \$1; unused RCA #9678 inertia suspension arm magnetic pickup and matching trans (used on expensive RCA automatic changers), \$6. P. A. Rosenblatt, P.O. Box 905, Hoboken, N. J.

WANTED—Recording head and turntable assembly—complete outfit, or less amplifier. Donald Keever, Box 612, Ashboro, N. C.

FOR SALE—Radio business, complete stock, incl. good assortment of tubes; volume controls, 7 Rider manuals; capacitors; transformers; radios; pilot lamps; radio chemical laboratory; Solar cap. anal; audio sig. gen.; sig. chaser; test meters, etc. \$1750 complete—will not sell anything separately. Askin Radio Service, 1107 S. Main St., Paris, Ill.

WANTED—Echophone EC-1 or similar 2 1/2 meter receiver, and transmitter. Robt. Westfall, The Pines, Woolwich, Maine.

URGENTLY NEEDED—Clough Brenkle sig. generator, or equivalent. S.O.S. Radio & Electrical Appliance Service, 371 1/2 Broad St., Newark 2, N. J.

FOR SALE OR TRADE—Telex code machine, spring wound, with tapes, 3v. oscilator, and electric code machine with tapes, 110v., with 110v. separate oscilator. V. F. Michael, 1687 McKinnon Ave., San Francisco, Calif.

WANTED—Inexpensive used radio parts for experimental and repair purposes. Kenneth Parish, Mt. Sterling, Iowa.

FOR SALE—Radio and electronic instruments and supplies. Also need some units—what have you? J. J. Trowbridge, 7936 Parnell St., Chicago 20, Ill.

FOR SALE OR TRADE—Shure ultra 701A crystal mike and new G.I. H90L 2-speed home recording unit. Want Hickok 188X or 185 sig. generator and Hickok 202 V.T.V.M., for cash or trade. E. H. Abel, 1320 Granada Ave., San Diego 2, Calif.

FOR SALE—200 new tubes in sealed cartons, O.P.A. list, and 200 perfect tubes (test O.K. and guaranteed) at 30% off O.P.A. list. What do you need? H. Mason, Radio, 114 E. 3rd St., Mt. Vernon, N. Y.

FOR SALE—Stetchell-Carlson aircraft radio, RCA electronic control, large quantity 5Z3 and other tubes, parts, cabinets, etc. Carnegie Radio Co., 3133 Carnegie Ave., Cleveland 15, Ohio.

YOUR OWN AD RUN FREE!

This is Sprague's special wartime advertising service to help radio men get needed parts and equipment, or dispose of radio materials they do not need. Send your ad today. Write **PLAINLY**—hold it to 40 words or less. Due to the large number received, ads may be delayed a month or two, but will be published as rapidly as possible.

Sprague reserves the right to reject ads which do not fit in with the spirit of this service.

HARRY KALKER, Sales Manager.

SPRAGUE PRODUCTS CO., DEPT. RSD-94, North Adams, Mass.
(Lobbying distributing organization of products manufactured by SPRAGUE ELECTRIC COMPANY)

SPRAGUE CONDENSERS * KOOLOHM RESISTORS

Obviously, Sprague cannot assume any responsibility, or guarantee goods, services, etc., which might be exchanged through the above advertisements

Records

(from page 22)

plete contrast, "Take It, Jackson,"—a jitterbug number with the stomp on rhythm and instrumental riff.

Artie Shaw and his Orchestra (20-1593) gives the maestro a clarinet-tootin' in "Don't Take Your Love From Me," plus a vocal by Lena Horne. "It Had To Be You," is a swinger, with brass and sax against a background of strings.

Reports of orders for several million discs have been placed for reinstated 118 Victor tunes . . . Don't overlook Johnny Hodges torrid Bluebird coupling

of "Passion Flower" and "Going Out the Back Way." Johnny is a favored instrumentalist with Duke Ellington's orchestra, and his discs always do well . . . Another good seller, Dina Shore's "Together" and "I Learned a Lesson I'll Never Forget" . . . another all-vocal. This chorus is unusual . . . sings orchestral type arrangements, with voices imitating muted brass, organ, etc. . . . one for the "live" self-service bin.

Columbia:

Ginny Simms (36731) sings a new coupling, "I'm Glad There Is You" and "Chinese Lullaby." Proof again why this handsome gel is going over big—a sure seller for disc-hungry dealers.

Harry James and his Orchestra

(36279) in "Estrellita" and "My Beloved Is Rugged." Harry solos on his trumpet, and there's a full orchestral background and a chorus or two of the lyrics. Looks like a favorite with jukes.

Jimmy Durante (36732) schnozzles two numbers as only this buffoon can: "Inka Dinka Doo" is close to the No. 1 novelty, and funny besides. "Hot Patatata" gives out with Jimmy's line with the gels—a lesson in luvv. Swell stuff for a lift—for customers and dealers alike.

Decca:

Glen Gray (18615) and the Casa Loma Orchestra in "Don't Take Your Love From Me" and "Forget-Me-Nots In Your Eyes." Fox trots with vocal chorus by Eugenie Baird.

Tiny Hill and his Orchestra (4447) in which Tiny vocalizes, "How Many Hearts Have You Broken?" and "Rose of Santa Rosa." Both are fox trots.

Dick Haymes and Helen Forrest (23349), the popular singing team, in "It Had To Be You" and "Together." The first is from RKO pix "Show Business"; the flip from Selznick pix "Since You Went Away." Victor Young and his Orchestra furnish backgrounds.

Classic:

The Barry Sisters offer four selections on two discs. 7103—"My Mama Told Me" and "Babylon." 7104—"Don't Keep Me Guessing" and "Kotareena." Both discs are popular re-recordings, and the Barrys give them a full, broad treatment.

The Three Suns (7105) give "I'm Always Making Believe," from 20th Century pix "Sweet and Lowdown." "You Always Hurt The One You Love" is with vocal refrain by Artie Dunn.

Josephine Houston (1009) with Classic Concert Orchestra in "The Lord's Prayer" and "Reverie." The first ties in with the singing of the "Prayer" following the President's D-Day prayer on the radio. The same singer does the recording.

Capitol:

Stan Kenton (166) and his Orchestra with Anita O'Day vocalizing a jive ditty, "Her Tears Flowed Like Wine." The coupling is a ballad, "How Many Hearts Have You Broken?" which sports a slick vocal by Gene Howard.

Benny Carter (165) presents two ballads, "I'm Lost" and "Just a Baby's Prayer at Twilight." Benny's alto sax glitters on both sides. The first is vocalized by Dick Gray, the over, by Savannah Churchill.

Continental:

Music Appreciation Records include classical selections on 10-inchers, at nominal prices. A series of special 10-inch albums includes "Treasures of Tchaikovsky" (A 300); "Brahms" (A301); "Schubert" (A302); "Dvorak" (A303) and "Beethoven" (A304). The selections have lasting interest for young and old, the prices are in the moderate bracket.



AFTER THE WAR - - - the name to look for in **RADIO ANTENNAS**

Today, BRACH produces only for Victory. But after the war, Brach will be ready with trained craftsmen and still more "know-how" to turn out superior antennas and other radio and electrical products for which dealers and public have been patiently waiting.

L. S. BRACH MFG. CORP.

World's Oldest and Largest Manufacturers of Radio Antennas and Accessories
55-65 DICKERSON STREET • NEWARK N. J.

How the HT-4 took it at 134° in the shade . . .



The following is quoted from a letter marked "Somewhere in Libya" signed by an Officer in an AACCS Group, USAAF:

"The writer just spent a year in Persia. Most of the time along the Persian Gulf where it really gets HOT! We operated one of your HT-4-B Transmitters near a place called Abadan. The transmitter performed very satisfactorily under the most unfavorable conditions. I doubt that your engineers ever dreamed that one of your rigs would be called upon to perform in a place where for 5 days and nights the temperature never dropped below 117 degrees and in fact it got up to 134 degrees during the daytime, that is "in the shade" temperature, the humidity was high and the air salty. Actually the transmitter got much hotter than that as it was installed in a brick building and no air conditioning, not even an exhaust fan. The HT-4-B was used on voice and gave very little trouble. One day the piece of bakelite under the phone/cw switch caught on fire but this was easily repaired. During the so called winter season, the temperature actually got as low as 36 degrees one day, we had a little trouble with mice crawling under the rig, which was set up on two 4x4 wooden sleepers. It seems the mice liked the heat and they would crawl up under the transmitter and get lodged in between the rectifier sockets and the frame when the operator switched on the transmitter the mice would fry, usually a fuse would blow but no other damage was done. We never did figure why the mice liked the Hallcrafters best. There were several other transmitters in the room but they always seemed to pick the HT-4-B; guess they were pretty smart mice!"

Just one of hundreds of real life experiences of Hallicrafters equipment. Out of this valuable experience will come your peace time short wave radio.

★BUY A WAR BOND TODAY!



hallicrafters RADIO

THE HALLCRAFTERS COMPANY • MANUFACTURERS OF RADIO AND ELECTRONIC EQUIPMENT CHICAGO 16, U. S. A.

Multi-Tester

(from page 21)

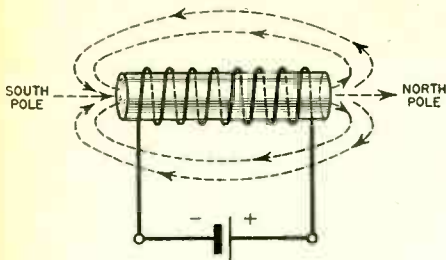


Figure 5.

we wish to measure currents up to 10 amperes. Our object then is to allow 1 ampere to flow through the

meter when 10 amperes flow in the circuit. Obviously, since the meter must be in series with the circuit, we must by-pass, or detour, 9 amperes around the meter. That means that our meter will be made one branch of a parallel circuit as shown in Figure 10. If 9 amperes are to flow through the parallel resistor, or shunt, when 1 ampere flows through the meter, the shunt must have 1/9 the resistance of the meter resistance. For any shunt resistor then we may use the formula:

$$(1) \quad R_{sh} = \frac{R_m}{(K-1)}$$

where R_m is the resistance of the meter and K is the desired current range/original current range.

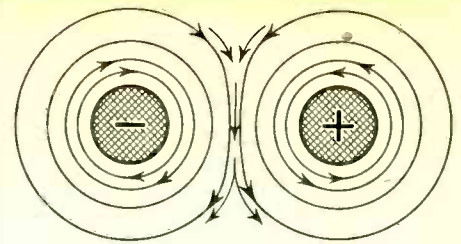


Figure 4.

VOLTAGE MEASUREMENT

From Ohm's Law we know that $E = IR$. Thus if we know the resistance and measure the current flowing through that resistance we can compute the voltage, E , shown in Figure 11. To measure D.C. voltages with a D.C. current meter we need only measure current through some known resistance connected across a source of potential. We must remember that the meter resistance has been added to that other load resistance. We can then use a current indicating meter together with a suitable series resistor, or multiplier, and calibrate the meter scale in terms of voltage for that value of series resistor.

Let us assume that a 0 to 1 milli-ampere meter is to be used to indicate at full scale deflection a potential difference of one volt across it and the series resistor. The meter resistance is 30 ohms. We can readily see that for one volt across some unknown resistor to cause one milli-ampere of current flow through that resistor, the latter must be 1000 ohms. Thus the series resistor must be the total resistance, R_t , minus the meter resistance, R_m , or $1000 - 30$,

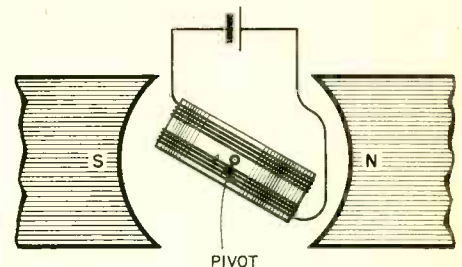


Figure 7.

or 970 ohms. We say then that the meter and series resistor look like 1000 ohms for a full-scale deflection of one volt. But, if we wish to measure 10 volts full scale, R_t must be 10,000 ohms. The meter and series resistor still offer 1000 ohms resistance per volt of calibrated full-scale deflection. This is then a 1000-ohm-per-volt voltmeter. Our required series resistance may be made equal to R_t , since R_m is negligibly small. Thus for every desired value of full-scale deflection voltage we need only multiply the desired full-scale deflec-

(Continued on page 28)

Photo Courtesy Pan American Airways

FOR MOBILE RADIO TRANSMITTERS AND SOUND EQUIPMENT

- Resistant to high humidity, wide temperature ranges, mechanical shock and vibration
- Frequency curve scientifically designed for highest articulation through interference and background noise
- The new Electro-Voice Model 600-D is available in high or low impedance output
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To the growing list of Electro-Voice developments, we now add the Model 600-D which may be adapted to a number of essential civilian applications. Built to rigid wartime specifications, it reflects the painstaking care of the Electro-Voice design laboratory. Electro-Voice Microphones serve you better ... for longer periods of time.

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This is the latest step in RCA's continuous program of merchandising to support RCA distributors, dealers and servicemen during the war. Pre-war, many up-to-the-minute RCA sales aids helped you sell and expand your markets... displays, indoor and outdoor signs, RCA clocks, and many others. After V-day, look for an even greater RCA merchandising service to direct sales your way.

Meanwhile, hard-hitting RCA advertisements in top magazines are doing the same job... building toward an even greater radio and electronics business for you after the war.

And this display, now available to you, helps set the stage for a profitable postwar boom in your sale of RCA Preferred Type tubes.

Remember, *the Magic Brain of all electronic equipment is a Tube...and the fountain-head of modern Tube development is RCA!*

New, full-color 40-inch by 28-inch display easel (shown here in black and white) to help you maintain your identification with RCA, and to sell the Preferred Type Idea... which means greater profits for you in the future.



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RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION - CAMDEN, N. J.

LEADS THE WAY... In Radio... Television... Tubes...
Phonographs... Records... Electronics

Multi-Tester

(from page 26)

tion in volts by 1000 to get the value of the total series resistance.

For any desired full scale deflection voltage:

$$(2) \quad R_s = R_m \times \frac{\text{New voltage range}}{\text{Old voltage range} - 1}$$

Old voltage range

where R_s is the added series resistance necessary to increase to the new range. R_m is the number of ohms per volt required to limit fullscale

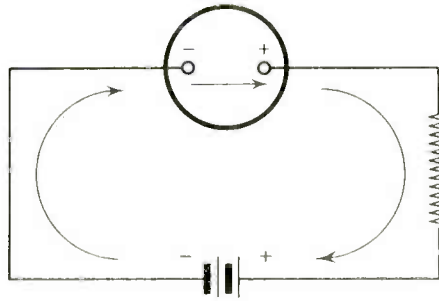


Figure 9.

current to that of the meter rating.

Thus if a 0 to 1/2 milliamperemeter is used, R_m is equal, for formula (2), to 2000 ohms per volt. A 100

volt range would then require a multiplier as follows:

$R_s = 2000 \times [(100/1) - 1]$ or 198,000 ohms. This assumes that the meter had a built-in multiplier resistor, making it a fundamental 0 to 1 volt meter. If it did not have this resistor but was only a straight 0 to 1/2 milliamperemeter with some low value of internal resistance, R_m would be:

(3) $R_s = R_m \times \text{voltage range}$ where R_m is the ohms per volt re-

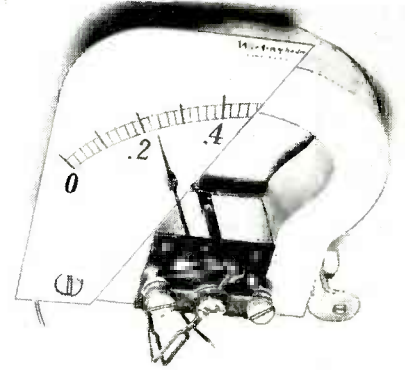


Figure 3.

quired for full scale deflection for one volt. Thus for the above meter minus the internal multiplier for the one-volt scale, R_s for 100 volt scale would be 2000×100 or 200,000 ohms.

The calibration of such a combination is straight forward since the voltage across a resistance is directly proportional to the current through the resistance. Thus full current through the meter gives the voltage for which the unit was de-

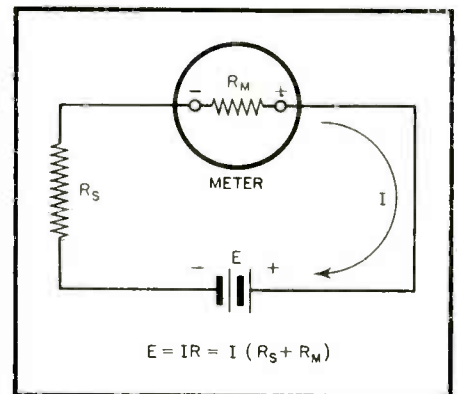


Figure 11.

signed for full-scale deflection. Half-scale reading represents a voltage of one-half that which would cause full scale deflection. Calibration is then simply a case of multiplying the current scale by the numerical value of the ratio between full scale current calibration and the full scale voltage causing that current. For example, a 0 to 1 milliamperemeter has calibrations from 0 to 1. If used as a 100-volt meter, the figure 5 on the scale represents 50 volts.

(To be continued)

Radio Service Dealer

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Designed originally for space saving and fine reception in portable radio sets Ken-Rad miniature tubes easily adapted themselves to walkie-talkie and other military uses Expansion and future progress with this rugged Little Giant is limitless

• Write for your copy of "Essential Characteristics" the most complete digest of tube information available

KEN-RAD

EXECUTIVE OFFICES

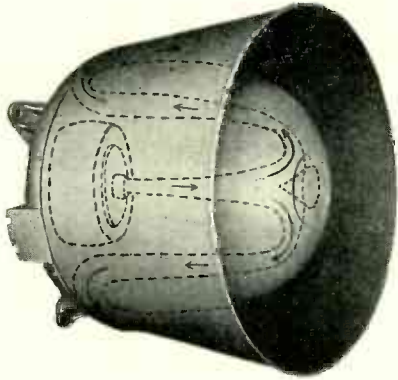
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INCANDESCENT LAMPS
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Left—MARINE SPEAKER; approved by the U. S. Coast Guard, for all emergency loudspeaker systems on ships. Re-entrant type horn. Models up to 50 watts. May be used as both speaker and microphone.

Right—RE-ENTRANT TRUMPET; available in 3½', 4½' and 6' sizes. Compact. Delivers highly concentrated sound with great efficiency over long distances.



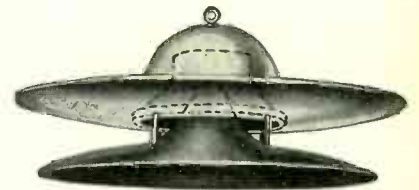
Left—RADIAL HORN SPEAKER; a 3½' re-entrant type horn. Projects sound with even intensity over 360° area. Storm-proof. Made of RACON Acoustic Material to prevent resonant effects.

Right—AEROPLANE HORNS; super-powerful and efficient P.A. horns for extreme range projection. 9 and 4 unit Trumpets available.



Left—PAGING HORN; extremely efficient 2' trumpet speaker for use where highly concentrated sound is required to override high noise levels. Uses P.M. unit.

Right—RADIAL CONE SPEAKER; projects sound with even intensity over 360° area. Cone speaker driven. Will blend with ceiling architecture. RACON Acoustic Material prevents resonant effects.



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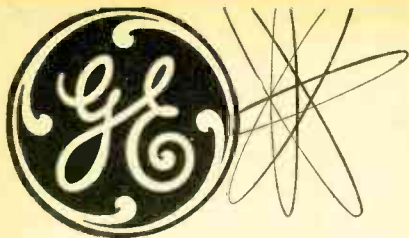
RACONS have always enjoyed a steady, high sales volume. We believe they always will, for our products are the finest that

money can buy, or engineering skill produce. Receiver units supplied with either metal or plastic diaphragms. RACON products generally cost less than competitive brands because a lower power-rated and lower-priced RACON will outperform higher power-rated units of other make. In other words, don't let catalog list-prices fool you. Basic costs and rated outputs are the prime factors worth considering.

That's why leading soundmen prefer and specify RACONS, they are dependable—a safe bet for steady sales and satisfied users.



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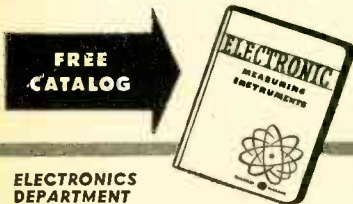


... PORTABLE TUBE CHECKER



THIS portable G-E Tube Checker contains sockets for all American tube types . . . provides practically a complete service shop of tube analyzing equipment. Equipped with the ingenious PMT Circuit Switch, this instrument is just one in the new General Electric line of SERVICE TESTING EQUIPMENT.

Among the other sturdy G-E units available for testing electronic circuits and component parts are: G-E uni-meters, audio oscillators, oscilloscopes, condenser resistance bridges, signal generators and other utility test instruments. For complete details about these accurate instruments, please fill out the coupon below. . . .



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DEPARTMENT
GENERAL ELECTRIC CO.**
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Please send, without obligation to me, the General Electric Testing Instrument Catalog, No. 94 (loose-leaf), for my information and files.

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Company _____
Address _____

GENERAL ELECTRIC
164-C9
Electronic Measuring Instruments

New Servicing Plan (from page 15)

dealer or authorized service center for repairs. The bigger appliances, such as refrigerators, ranges, water heaters, washers, ironers, dishwashers, disposals, electric sinks, console radios or bulky table combinations are inspected on the premises of the customer. Repairs are then made which do not require extensive tinkering—as replacing switches or calrod units and such. But if the serviceman finds the appliance needs extensive repairs, it is taken to the proper service center where it is given an expert overhauling.

How About It, Radio Service Dealers?

A sample of 4,500 typical American families were surveyed recently in various parts of the country by OCR to find out the repair status, age and quantity of about two dozen household appliances and items of equipment.

Radios—as was to be expected—stand out as the item most in need of repair. Although more than half of the appliances are five or more years old, the percentage found to be in working order ranges from 85 per cent for radios to 99 per cent for several items of heating equipment. About 8 per cent of radio-owning households have none in working order. All in all, though, about 28 per cent of the radios in households are in need of repairs and servicing, since the beginning of the year. With over 50 per cent of the domestic radios in current use five or more years old, the volume of orders for repairs and servicing has been greater than could be handled, what with curtailed manpower and shortages in the popular types of tubes and replacement parts. So only about 50 per cent of radio set owners were able to get needed repairs and service.

The case is a little different with certain appliances. Servicing and repair was obtained by 70 per cent of the families who wanted this work done for toasters. But only 9 per cent of them were in need for repairs. With 16 per cent of owners needing repairs for their vacuum cleaners, more than 75 per cent of them had no trouble getting service.

Refrigerators are 95 per cent of them in good working order, though 63 per cent of refrigerators are five years or more old. Though only 9 per cent needed repairs, only about half of these jobs could be serviced. Of the 16 per cent of owners who have tried to obtain washing machine repairs this year, about two-thirds have been successful.

On this subject, it appears there is no dearth of opportunities for business for radio service dealers. It may take longer nowadays to handle a given volume of service and repair business, but that it is there, waiting for the enterprising, aggressive men in the trade to cash in on, there is no denying. A "master" service plan, now being operated by General Electric through its distributors and dealers, is described in this issue. Service is "big business."

**READY
FOR SHIPMENT from
Lafayette Radio Corp.
Chicago or Atlanta**

Fractional H.P. Motor
For use in model work, or in any usage where a small, powerful, slow speed motor is required. Compact, 1/20th horsepower induction type. Operates from 25 to 30 volts AC, 60 cycles. Motor speed 2400 RPM, with gear train driving 1/4" shaft at 24 RPM. 2"x1 3/4"x3" overall, excluding shaft
M14699
Specially priced, \$2.50

**RCA Facsimile
Broadcast Receiver
RCA MODEL FAX-2A**

Fully automatic pre-tuned high fidelity radio receiver, facsimile printer amplifier, facsimile printing unit, and Telechron time switch clock. This instrument has many uses in the laboratory. The printing unit utilizes carbon paper in contact with white paper as a recording medium. Complete with tubes and operating and service instructions, but less recording paper.
M25749 \$99.50

**IRC 20-Ohm,
25-Watt
Power Rheostat**
All metal, die cast aluminum case. Heat uniformly dissipated throughout element. 1/4" shaft screw driver adjustment.
M8167. 1 1/2" diameter \$1.39

**Meissner 9" Slide
Rule Dial.** Single speed vernier dial mechanism. Fits 3/8" shaft. 5-band scale calibrated 5.85-18.2mc, 17.6-42mc and 133-406kc.
Includes escutcheon and bayonet type dial-light sockets. Ratio 17:1
M9978-Type. 23-8230 \$4.70

NOTE: All items subject to prior sale

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104 pages packed with items and values of high interest to industry, governmental agencies, dealers, service men, radio schools, etc. The only 1944 volume of its kind. Copies are going fast . . . MAIL COUPON IMMEDIATELY.

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**Lafayette
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CHICAGO 7, ILLINOIS ATLANTA 3, GEORGIA

Radio Service Dealer



INSPECTION ON THE LINE

MAKING HISTORY IN COMMUNICATIONS



Inspection before assembly, quality control . . . more than that . . . team work from material dispatcher, assembler, inspector, to the girl on the packing line . . . have made possible the fine achievement represented by the Army and Navy "E" Award presented to the men and women of the Universal Microphone Company.

In production of military microphones before Pearl Harbor, Universal had the necessary "know how" for immediate war production. The engineering experience and production efficiency of war production will be reflected in the electronic voice communication components offered by Universal to consumers in the future. Until then — BUY WAR BONDS.

UNIVERSAL MICROPHONE COMPANY
INGLEWOOD, CALIFORNIA



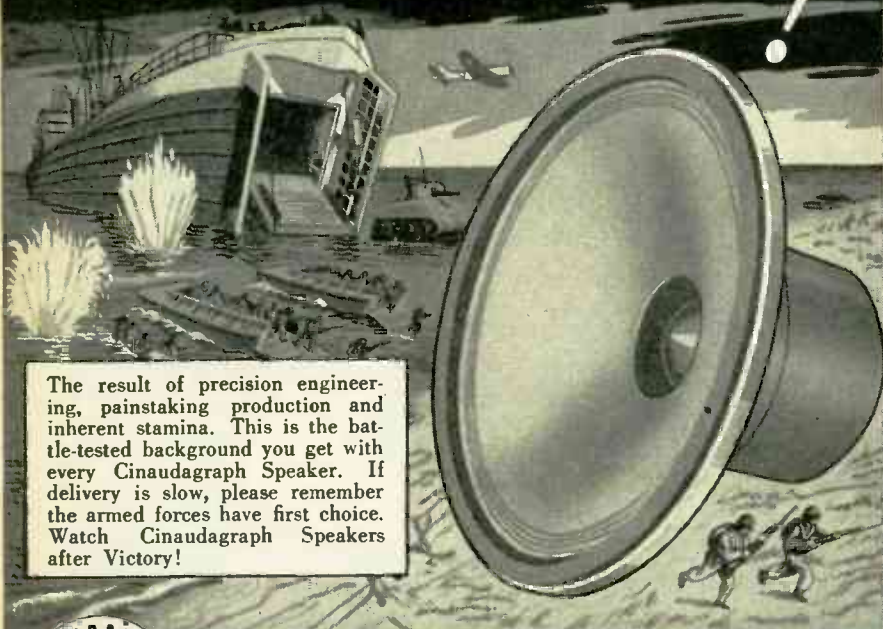
FOREIGN DIVISION: 301 CLAY STREET, SAN FRANCISCO 11, CALIFORNIA · CANADIAN DIVISION: 560 KING STREET WEST, TORONTO 1, ONTARIO, CANADA

Trained Seal Stuff

Ex-inspectors from the San Francisco Signal Corps Inspection Zone operating in Los Angeles, have banded together to form a social group known as the "Trained Seals' Chowder & Marching Club." Their first annual

picnic will be held sometime in October. Frolicsome titles: R. R. Finn is Chief Elbow Bender and Master of the Hounds; Sanford Bookee, Chief Historian and Bail Bondsman; Floyd Ford, Chief Keeper of the Muggs & Official Flusher. Dr. Ralph L. Power is permanent secretary-treasurer.

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G-C Woven Fabric Belts are the finest replacements for all sets. Easy to install — no slipping — no stretching — no adjustments. A perfect fit every time.

Kits Available with 25, 50, 100, 200 or 300 Belts.

Order From Your
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STEEL CABINET AND MEASURING DEVICE

FREE! You Pay For Belts Only

GENERAL CEMENT MFG. CO.
ROCKFORD, ILLINOIS



MEN IN THE NEWS



Mallory's Ruben Awarded

Samuel Ruben, closely associated with P. R. Mallory & Co., Inc., for twenty years, has recently been awarded a Certificate of Appreciation by the War Department for extraordinary contributions to the war effort.

Among Mr. Ruben's hundreds of inventions are a ceramic coated resistor, dry electrolytic condenser (commercialized by Mr. Mallory), magnesium-copper sulfide a-c/d-c rectifier, quick-heater A.C. tube, chromoxide insulated magnet wire and ceramically insulated resistance wire.



YOURS
..FOR THE
ASKING

Available from local dealers or by writing factory direct.

UNIVERSAL STROBOSCOPE

This handy phonograph turntable speed indicator, complete with instructive folder, is now available gratis to all phonograph and recorder owners through their local dealers and jobbers. As a recorder aid the Universal Stroboscope will assist in maintaining pre-war quality of recording and reproducing equipment in true pitch and tempo.

Universal Microphone Co., pioneer manufacturers of microphones and home recording components as well as Professional Recording Studio Equipment, takes this means of rendering a service to the owners of phonograph and recording equipment. After victory is ours — dealer shelves will again stock the many new Universal recording components you have been waiting for.



UNIVERSAL MICROPHONE CO.
INGLEWOOD, CALIFORNIA

Radio Service Dealer

Letters to the Editor

DEALERS WANT FRANCHISES NOW

Editor:

In your July issue in Letters to the Editor I observed one letter in particular titled "Post-War Dealer." Since I read every issue of the magazine thoroughly I couldn't miss that letter, and I have also been trying to plan my post-war career as a dealer. Ever since being discharged from the army and reopening my store-shop, I have written to several manufacturers but have only received one reply and that one was very unenlightening.

I don't want to wait until radios and appliances appear in everyone of my competitor's windows as I know they will be far ahead of me, at this rate. So if you can get any data sent to me, I will be grateful.

I enjoy very much RADIO SERVICE DEALER, as I have for several years, but kind of lost out while in the army.

*Henry A. Neis,
Fort Worth, Texas.*

Manufacturers are just about getting their plans in shape for post-war. Jobber

and dealer franchises, methods of distribution, new or additional lines, markups, models, etc. are being studied. In this issue we announce Emerson Radio's P.D.Q. (Preference Delivery Quotas) Plan through which customers can make sure of early delivery of the radio of their choice by signing up with their dealers now. Among the many news items, Zenith's general program for dealers will also be found in this issue, and in the August number, Philco's preliminary plans were announced, based on exclusive interviews by our Managing Editor. By this fall a better and more complete picture along these lines may be announced by the majority of radio and appliance manufacturers, as news and through trade advertising. RADIO SERVICE DEALER anticipates that it will carry its share of these advertising announcements, plus news of the latest developments (as the above, for example) in its editorial pages.

For the current situation in replacement parts and tubes, radio serviceman Neis may be interested in reading "Tubes and Parts," on page 11 of this issue.

MODEL RADIO NUMBERS

Editor:

I would like to make a suggestion to you which I think can help the service dealer a great deal.

In the past few years it has been the practice of most radio receiver manufacturers to neglect to properly

identify the model numbers on the back of radio chassis.

I have run across radios such as Zenith, Philco, Emerson, Admiral and others where it is impossible to find any model number, making it necessary to waste much time trying to locate service notes for them.

A note from you to all well known radio manufacturers, as the service dealer's representative, may persuade them to do something about it.

*Louis Wealer,
Philadelphia, Penna.*

Licensing of auto ownership calls for certain mechanical and physical data which manufacturers supply on a metal plate, usually found under the hood. Non-licensing of radio ownership leaves the matter of identifying model types pretty much up to the manufacturer or assembler. When even the least costly radio is a welter of circuits and circuit variations, some method of keying the models for easy identification in service manuals or instruction sheets would certainly be a boon to consumers and servicemen alike. RADIO SERVICE DEALER goes on record right here and now, urging all manufacturers of radios (whether national or private brands) to "fingerprint" every one of their models and their variants so that servicemen can always identify them. This will help the servicing, the sets will work better for longer and give the customers more enduring satisfaction. All of which adds up to a good hunk of good-will for the manufacturer. And how many dollars this side of a billion is that worth?

The Publishers of RADIO SERVICE DEALER are proud that over 85% of the Nation's leading Service Dealers are paid subscribers. "RSD" has and will consistently carry exclusive, factual articles that progressive Service Dealers agree are well worth the low subscription price of \$2 for 12 issues or \$3 for 24. A few new subscribers can be accepted. Tell your associates. Meanwhile, renew your own subscription as soon as you are notified it is about to expire. Cowan Pub. Corp., 342 Madison Ave., New York 17, N. Y.



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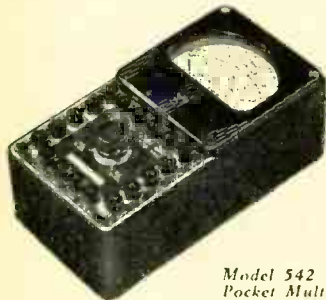
A 1-year subscription to RADIO SERVICE DEALER costs \$2.00—2-year subscription costs \$3.00.



Model 504-A
Tube and Set Tester

The lead honker of the V Flight is pretty sure to be one of the oldest and wisest birds in the flock. Where he leads the others follow.

In the test instrument field, too, the leader must have years of experience and know-how . . . to pioneer new departures in engineering . . . and design . . . and to PROVE them.



Model 542
Pocket Multimeter

That's one of the reasons why Supreme-built instruments have done and are doing such an outstanding job in the V Fight. The experience and research of over 15 years are built into every Supreme instrument.



Model 592
Speed Tester

When considering postwar service equipment, it will pay you in accuracy, dependability, durability and long-run economy, to go along with a leader whose products are pledged "Supreme By Comparison."



In Trade
(from page 8)



G.E. Irons This Fall

M. B. Ross, sales manager of the company's traffic appliance divisions, announces that two models of electric irons will be manufactured by the General Electric Company in its Ontario, California plant under recent OPA and WPB rulings and directive orders.

Both models will be of the automatic type. The majority of the 421,000 irons, which was the quota granted G-E, will carry a retail price of \$8.55, including tax. The other model will retail at \$5.70, including tax. These prices are comparable to those of prewar models.

Mr. Ross said the new irons will be similar to the prewar irons manufactured by G-E with only minor modifications in the external finish.

It is expected that delivery of the irons will begin in September. General Electric's regular distributors will receive the first shipment based on iron sales of 1940, and dealers will be able to offer the irons for sale to the general public shortly afterward.

Price ceilings for electric irons have been announced by the War Production Board. About 81 per cent of the total 2,037,838 irons authorized to be produced by the industry this year for consumers will retail from \$5.30 to \$11.70, based on March, 1942, prices.

Change Your Tube Ceilings

Radio service dealers and distributors have put in effect the maximum ceiling prices governing the sale of radio tubes as established by the OPA effective May 20th.

The OPA has announced the following corrections in the original retail ceiling prices, effective June 26:

Type	Maximum Retail Prices	
	Originally Announced	New Price Effective 6/26
01A	\$.85	\$.90
2A3	1.60	1.90
6P7G	2.30	2.35
6SL7GT/G	1.55	1.60
12SL7GT/G	1.55	1.60

Dealers should make the above changes on the OPA ceiling price poster which was enclosed with the June issue of RADIO SERVICE DEALER.

Your Future

- ★ AS A
- ★ Radio Engineer
- ★ Assistant Engineer
- ★ Layout Draftsman
- ★ Laboratory Assistant
- ★ Quality Tester
- ★ Analyser
- ★ Phaser

depends on what you do now!

Why not find out what Motorola offers you in future security, rapid advancement, recognition, and salary increases. The positions open are in Development, Specifications, Production, Engineering and Test Equipment. List your qualifications on one side of a sheet of paper. Name the position you want. We'll send you the details. Get your letter in the mail today.

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CLAROSTAT

ROLLING ON TO
Victory

★ Clarostat continues to be engaged 100% in the most important job of all—winning the war—on land, sea and in the air.

But after victory has been won, Clarostat promises the trade—servicemen, jobbers and others—that Clarostat products for initial and replacement uses alike, will once more be generally available for peacetime pursuits. Meanwhile, let's keep 'em rolling!

ARMY
NAVY

CLAROSTAT Controls and Resistors
CLAROSTAT MFG. CO., Inc., 285 7 N. 6th St., Brooklyn, N. Y.

Radio Service Dealer



Official U. S.
Signal Corps Photo

Let these guys start it!

There's a day coming when the enemy will be licked, beaten, whipped to a fare-thee-well—every last vestige of fight knocked out of him.

And there's a day coming when every mother's son of us will want to stand up and yell, to cheer ourselves hoarse over the greatest victory in history.

But let's not start the cheering yet.

In fact, let's not start it at all—over here. Let's leave it to the fellows who are *doing* the job—the only fellows who will *know* when it's done—to begin the celebrating.

Our leaders have told us, over and over again, that the smashing of the Axis will be a slow job, a dangerous job, a bloody job.

And they've told us what our own common sense confirms: that, if we at home start throwing our hats in the air and easing up before the job's completely done, it will be slower, more dangerous, bloodier.

Right now, it's still up to us to buy War Bonds—and to *keep on* buying War Bonds until this war is completely won. That doesn't mean victory over the Nazis *alone*. It means bringing the Japs to their knees, too.

Let's keep bearing down till we get the news of final victory from the only place such news can come: the battle-line.

If we do that, we'll have the *right* to join the cheering when the time comes.

Keep backing 'em up with War Bonds

RADIO SERVICE DEALER

This is an official U.S. Treasury advertisement—prepared under auspices of Treasury Department and War Advertising Council.



ELECTROLYTICS

● The major part of all radio set electrolytic replacements these wartime days can be handled with these nine selected voltage ratings and capacitances comprising the AeroVox Victory Line:

TYPE PRSV DANDEES			
D.C.W.V.	Capacity	D.C.W.V.	Capacity
25	25 mfd.	250	20 mfd.
50	10 mfd.	450	10 mfd.
150	20 mfd.	450	10-10 mfd.
150	20-20 mfd.	450	40 mfd.
150	50 mfd.		

● Ask Our Jobber . . .

AEROVOX CAPACITORS
INDIVIDUALLY TESTED

AEROVOX CORP., NEW BEDFORD, MASS., U. S. A.
In Canada: AEROVOX CANADA LTD., HAMILTON, ONT.
Export: 13 E. 40 ST., NEW YORK 16, N. Y. Cable: 'ARLAB'

FADA'S S.M. 81 SERVICE MANUAL

Here's the Book You've Been Waiting for!
Contains all available Service Data on all FADA Receivers \$1.00 Plus Postage
Send for it Now!

FADA OF NEW YORK
928 BROADWAY NEW YORK, N. Y.
Large Stock of Replacement Parts & Cabinets

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Radio AND ELECTRONIC DEVICES

BURSTEIN-APPLEBEE CO.
1012-1014 McGee St. • Kansas City 6, Missouri



All of the features that make for **BETTER WORK**, Done faster, with **Less effort**. . . just a few of these features are mentioned below.

STRENGTH GRIP-EASY HANDLE FREEDOM from SHOCK plus INDIVIDUALITY furnished by 173 types

WRITE FOR CATALOG

VACO PRODUCTS CO.
311 E. ONTARIO ST., CHICAGO 11, ILL.
Canadian Branch Whse. • 560 King St. W., Toronto 2, Ont.

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

\$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 in Defense Stamps 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.

what's that?

"Are Distributors Necessary?"

There are a few businessmen, a lot of typewriter executives and plenty of arm-chair strategists who say that the distributor is a dying duck because his is an uneconomic function. But the fact remains that the cost of distribution has always diminished

in direct proportion to the reduced costs of manufacturing which result from skilled product development and volume sales. And remember this...the distributor is an important factor in both of these vital phases of a successful merchandising operation!

Here Is What Your Motorola Distributor Will Do For You

- 1 He will introduce the Post War Motorola F-M Radios and Automatic Phonograph Radios by exhibiting the complete line in his showrooms.
- 2 He will carry a complete stock in all price brackets so you can order and get delivery from day to day. He will carry parts for replacement and servicing.
- 3 He will help train *your* Servicemen... teach them about F-M, Television (when it is available), and how to service automatic phonographs.
- 4 He will help educate *your* Salespeople... give them facts about the radios they sell. He will reduce the loss of sales which result from poor demonstration.
- 5 He will provide you with sales-stimulating ideas and advertising promotions. He will strengthen your entire radio sales department.
- 6 He is your responsible, ready-able-and-willing trouble shooter... a man with an organization you can reach with a five-cent telephone call.

the Motorola Distributor Organization is Ready

GALVIN MFG. CORPORATION • CHICAGO 51

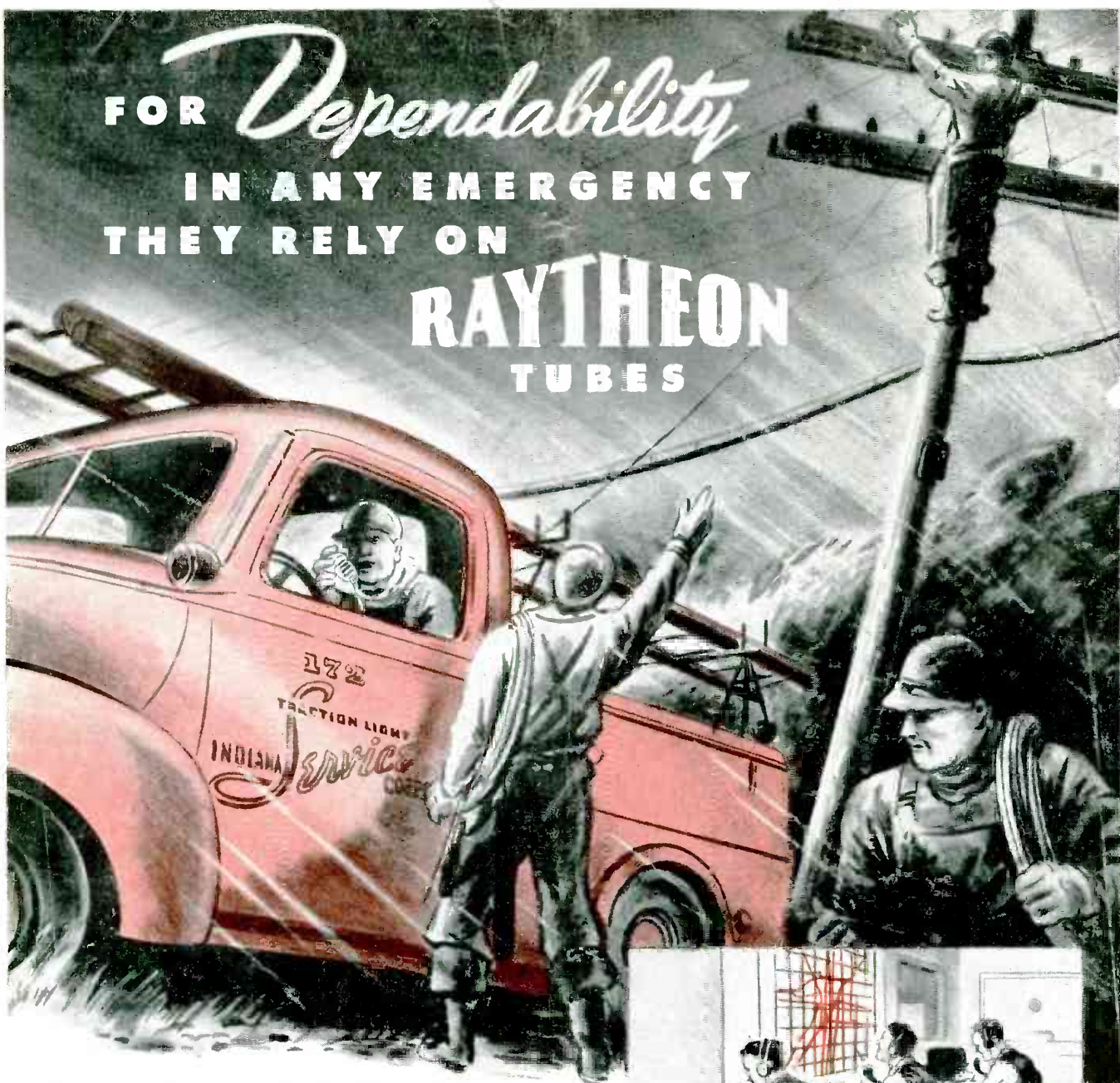
Motorola Radio



In cooperation with the U. S. Army Signal Corps, Motorola Engineers have developed and are producing in quantity the very versatile and now famous Walkie-Talkie. This is a complete 2-way F-M, Portable Radiotelephone system, battery-powered and carried pack-fashion on the fighter's back.



FOR *Dependability*
 IN ANY EMERGENCY
 THEY RELY ON
RAYTHEON
 TUBES



In a busy industrial city like Fort Wayne, Indiana, it is necessary that any interruption in electric service be remedied immediately. INDIANA SERVICE CORPORATION which supplies electric light and power to Fort Wayne's war plants, has found that two-way radio between the dispatcher's office and service, patrol and repair trucks assures the quickest and most reliable means of communication in any emergency. To assure even greater reliability, this electronic communication system is equipped with RAYTHEON high fidelity tubes.

That "Plus-Extra" quality that proved RAYTHEON the best tube in the past, will be enhanced with all the knowledge that is being gained from manufacturing advanced electronic equipment for the war effort. This wartime



experience will doubly guarantee that you will be able to offer your customers the best engineered and precision-made electronic tubes for all applications. In the meantime, RAYTHEON will continue to supply you with all the MR tubes that WPB allows, for you to pass on to those who need them most.

Raytheon Manufacturing Company

RADIO RECEIVING TUBE DIVISION

Newton, Massachusetts • Los Angeles • New York • Chicago • Atlanta



All Four Raytheon Divisions Have Been Awarded Army-Navy "E" Plus Stars

RAYTHEON

High Fidelity

RADIO AND ELECTRONIC TUBES



DEVOTED TO RESEARCH AND MANUFACTURE OF TUBES FOR THE NEW ERA OF ELECTRONICS