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radio

SERVICE DEALER

This Month

WAR-TIME SERVICING

RSD ANNUAL INDEX

RADIOMEN FOR NAVY

EQUIVALENT TUBES

MORE RADIO QUIZES



PRICE

25¢

Defense Savings Pay-Roll Allotment Plan

How company heads can help their country, their employees, and themselves

voluntary pay-roll allotment plan

- helps workers provide for the future
- helps build future buying power
- helps defend America today

This is no charity plea. It is a sound business proposition that vitally concerns the present and future welfare of your company, your employees, and yourself.

During the post-war period of readjustment, you may be faced with the unpleasant necessity of turning employees out into a confused and cheerless world. But you, as an employer, can do something *now* to help shape the destinies of your people. Scores of business heads have adopted the Voluntary Pay-roll Allotment Plan as a simple and easy way for every worker in the land to start a *systematic* and *continuous* Defense Bond savings program.

Many benefits . . . present and future. It is more than a sensible step toward reducing the ranks of the post-war needy. It will help spread financial participation in National Defense among all of America's wage earners.

The widespread use of this plan will materially retard inflation. It will "store" part of our pyramiding national income that would otherwise be spent as fast as it's earned, increasing the demand for our diminishing supply of consumer goods.

And don't overlook the immediate benefit . . . money for defense materials, quickly, continuously, *willingly*.

Let's do it the American way! America's talent for working out emergency problems, democratically, is being tested today. As always, we will work it out, without pressure or coercion . . . in that old American way; each businessman strengthening his *own* house; not waiting for his neighbor to do it. That custom has, throughout history, enabled America to get things done *of its own free will*.

In emergencies, America doesn't do things "hit-or-miss." We would get there *eventually* if we just left it to everybody's whim to buy Defense Bonds when they thought of it. But we're a nation of businessmen who understand that the way to get a thing done is to *systematize* the operation. That is why so many employers are getting back of this Voluntary Savings Plan.

Like most efficient systems, it is amazingly simple. All you have to do is offer your employees the convenience of having a fixed sum allotted, from each pay envelope, to the purchase of Defense Bonds. The employer holds these funds in a separate bank account, and delivers a Bond to the employee each time his allotments accumulate to a sufficient amount.

Each employee who chooses to start this savings plan decides for himself the denomination of the Bonds to be purchased and the amount to be allotted from his wages each pay day.

How big does a company have to be? From three employees on up. Size has nothing to do with it. It works equally well in stores, schools, publishing houses, factories, or banks. This whole idea of pay-roll allotment has been evolved by businessmen in cooperation with the Treasury Department. Each organization adopts its own simple, efficient application of the idea in accordance with the needs of its own set-up.

No chore at all. The system is so simple that A. T. & T. uses exactly the same easy card system that is being used by hundreds of companies having fewer than 25 employees! It is simple enough to be handled by a check-mark on a card each pay day.

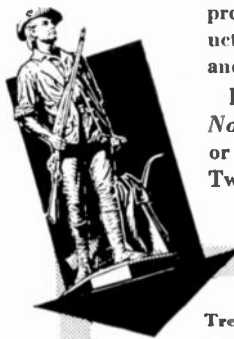
Plenty of help available. Although this is *your* plan when you put it into effect, the Treasury Department is ready and willing to give you all kinds of help. Local civilian committees in 48 States are set up to have experienced men work with you just as much as you want them to, and no more.

Truly, about all *you* have to do is to indicate your willingness to get your organization started. We will supply most of the necessary material, and no end of help.

The first step is to take a closer look. Sending in the coupon in no way obligates you to install the Plan. It will simply give you a chance to scrutinize the available material and see what other companies are already doing. It will bring you samples of literature explaining the benefits to employees and describing the various denominations of Defense Savings Bonds that can be purchased through the Plan.

Sending the coupon does nothing more than signify that you are anxious to do *something* to help keep your people off relief when defense production sloughs off; *something* to enable *all* wage earners to participate in financing Defense; *something* to provide tomorrow's buying power for your products; *something* to get money *right now* for guns and tanks and planes and ships.

France left it to "hit-or-miss" . . . and *missed*. Now is the time for *you* to act! Mail the coupon or write Treasury Department, Section A, 709 Twelfth St. NW., Washington, D. C.



FREE - NO OBLIGATION

Treasury Department, Section A,
709 Twelfth St. NW., Washington, D. C.

Please send me the free kit of material being used by companies that have installed the Voluntary Defense Savings Pay-Roll Allotment Plan.

Name _____

Position _____

Company _____

Address _____

Radio

SERVICE-DEALER

SOUNDMAN AND JOBBER

Reg. U. S. Pat. Off.

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Cover Photo



★ Though troubled are the times, tough the fight ahead, and cheer at a premium, the season brings good things in the form of courage, determination, unity. This year we wish our friends here and in the far-flung reaches of the earth a strong spirit and a stout heart in the name of Liberty.

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TRANSIENTS

CHRISTMAS STORY

THIS IS THE ONE time of year we are permitted to become sentimental—the time we are given license to speak from the heart. And having this privilege, and the paper on which to exercise it, we are going to tell you through the medium of a true story, just what we think of radio servicemen.

An executive of a large New York Department Store spent Thanksgiving day with us. Though we do not recall how the subject came up, he asked us our opinion of the *Reader's Digest* article. Said we, "The publishers and the investigators were much too 'gyp-minded' to present an unbiased report." Our friend smiled and said, "I thought as much. I had an interesting experience with a radio man just a few months ago, and if this man is typical, then—if I am any judge of human beings—the average serviceman is a good sort. Not only that," he added, "but they appear to have a natural enthusiasm that many of us have lost in the shuffle—somewhat the same 'loyalty to their calling', let us term it, that the scientist has."

"That is true," we remarked. "Although that very quality in the serviceman has often been used against him. It is felt that he is possibly too much of the scientist and too little of the businessman for his own good—but that is a moot question."

"Well, for my own part," our friend said, "I'd make a distinction in the case of radio men, just as I do in the case of scientists, good auto mechanics and doctors. None of them have any occasion to sell me a bill of goods, and I don't know but that I'd resent it if any of them should try. If I can find an auto mechanic who loves motors, he's the fellow I want to fix my car, because if he loves motors for themselves he isn't going to let one get sick if he can help it.

"And that's the way it was with this radio man. I doubt that he was at all concerned over my being put out—his only concern was the receiver which, though it worked, had a decidedly sick sound. But what particularly struck me was his happy absorption in diagnosing the trouble. I venture to say that it was something quite simple in the end—and as I recall it, he merely replaced a tube—but whatever he did, he had a lot of fun in doing it, and he was so damned pleased with himself—as I would have been, too—that I think he would have been just as happy if I hadn't paid him. He'd already paid himself."

Most of you know what this executive meant. Whether or not he is right we do not pretend to know. Possibly the business angle is very important. But it means nothing without a "feeling for radio."

BEWARE THE SALVAGER

PATIENCE, WE BELIEVE, is one of the Virtues. Loyalty is, or should be, another. But whether or not you consider it worthy to exercise the Virtues, it is good Scotch sense to stay on the side of quality and reliability.

The long-established and reliable parts and test-equipment manufacturers are finding it difficult to meet both commercial and national defense demands as promptly as they would like. Naturally, national defense comes first; commercial demands afterwards. You wouldn't want it any other way.

But there are fourth-rate, upstart parts and test-equipment "suppliers" who are attempting to capitalize on the difficulties of our old and trusted friends. You can get second-rate parts and "salvage" test equipment without waiting. But you won't know what you're getting. It is better policy to have patience and buy from the Old Reliables.

WHERE RECEPTION IS DIFFICULT

THEY DEPEND UPON **RAYTHEON** TUBES
ON THE SUPER CHIEF

Los Angeles to Chicago in 39 hours and 45 minutes on the streamlined Santa Fe Super Chief! One of America's fastest and most luxurious trains . . . Motion Picture Stars, famous writers and internationally known industrialists all ride the Super Chief.

Radio reception on the Super Chief must be the best obtainable . . . that is why the Santa Fe chose RAYTHEON TUBES. They knew they could depend upon RAYTHEONS to deliver peak performance at all times.

There must be a good reason why so many service men and dealers are turning to RAYTHEON TUBES for replacement . . . You can have the answer by asking your RAYTHEON distributor today. Remember, for all the extra quality . . . RAYTHEONS Cost No More!

Raytheon Production Corp.

NEWTON, MASS. • NEW YORK • CHICAGO • LOS ANGELES • ATLANTA



WORLD'S LARGEST EXCLUSIVE RADIO TUBE MANUFACTURERS



RACON gives Sound a "shot in the arm!"

Compare the crystal clear, undistorted reproduction afforded by RACONS . . . or the quality of materials and workmanship . . . or the advanced engineering design — and you'll know why leading Soundmen prefer, specify and use them. RACONS cost no more. RACONS give Sound a "shot in the arm,"—make selling or renting Sound Equipment easy. When bidding Defense requirements remember RACON protects you with or without priorities. RACON is the only loud speaker manufacturer supplying non-priority restricted materials in speakers. See your jobber—get the facts—or write to us for particulars.

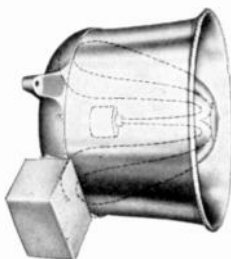
In The Emergency RACON PRODUCTS DO THEIR SHARE

ON LAND . . . in Defense plants, and at Army bases and training centers you'll find thousands of RACON's Horns, Speakers and driving units working hard, in all kinds of weather, for Uncle Sam.

AT SEA . . . all leading Steamship Lines and the Navy use RACONS. Yes, where lives are at stake, and dependability important — and specifications extremely rigid — that's where you'll find RACONS.

IN THE AIR . . . at airports, commercial and Government owned, on planes, dirigibles and blimps—where stamina, ruggedness, and efficiency under all conditions count . . . you'll find RACONS.

MARINE HORN SPEAKERS



Re-entrant type speakers using horn type units for marine and general P-A applications — may be used as loud-speaker or as a microphone. Miniature and regular sizes approved by the

Bureau of Marine Inspection and Navigation, Department of Commerce, for marine work. In all sizes, miniature, midget, regular and bull, handling from 5 to 50 watts.

There is a RACON for every purpose . . . here are just a few:



RACON P. M. HORN UNITS

Operating capacity 12-15 watts, peak 25 watts. Other P.M. units available from "baby unit" of 5 watts to "bull unit" with an operating capacity of 50 watts. Efficiencies of the highest order obtainable with the finest magnetic material and steel utilized.



MULTI-UNIT AEROPLANE HORNS

For SUPER-POWER highly efficient sound projection. Developed for installations where space is limited and weight factor small. STORMPROOF—guaranteed weatherproof even if completely immersed in water. Indoor and outdoor types 42" and 54" long are demountable, have heavy cast aluminum throat sections and suspension rings. Indoor types take 2 or 4 units, outdoor types 4 or 9 heavy units. Up to 3 mile ground projection capacity.

Re-Entrant Trumpets



A compact trumpet of the double re-entrant type. Occupies but a small space, nevertheless has a long air column enabling it to deliver

highly concentrated sound of the greatest efficiency over long distances. Base and inside cone arm made of aluminum castings, outside bell of heavy gauge aluminum spinning, centre section of RACON ACOUSTIC material to prevent resonant effects. Available in 6', 4½', 3½', and 3' air column units.

RACON ELECTRIC CO. 52 EAST 19th ST. NEW YORK, N. Y.

WAR-TIME SERVICING — TUBES

PRIOR to the declaration of war, the national emergency was, in comparison, a half-way measure. For that matter, many people were thinking and operating in terms of "business as usual."

That condition no longer exists. We are at war, and the stringencies we have experienced and expected are nothing compared to the stringencies that will now face us. It is inevitable, and we must do the best we can with what is made available.

The value of radio broadcasting during wartime—and let it be said that many were not entirely convinced of its value—has been brought forcibly to the front in recent weeks. There can no longer be any question of its value, if not its necessity, and it should now be obvious to every serviceman the importance of keeping the nation's receivers in operation. This is your responsibility, and you must meet it.

MEASURES OF NECESSITY

From now on it will be necessary to think in terms of substitutes or alternatives in repairing receivers, for there is no longer any guarantee that exact or near-exact replacements will be available *in time* to place any given receiver back into operation. Substitutes or alternatives will have to be resorted to, and customers will have to take with as good grace as possible the installation of misfit, or makeshift components. It may be that the point will no longer be to restore a receiver to its original operating condition, but rather to place it in satisfactory operation, and no more.

We all hope, of course, that the repair situation will not deteriorate to this extent, but all servicemen must prepare for such a contingency.

There will be many subjects bearing on this situation to discuss from month to month. For the present, let us view the subject of receiver-type tubes.

TUBE SITUATION

The situation with regard to receiver-type tubes has not been, is not, and may not be critical, but from where we sit we cannot escape the feeling that as time goes on, and with war demands as large as they will be, that many types will no longer be produced and will rapidly disappear from jobbers' and dealers' shelves. The problem, then, will be to use an equivalent

type or an alternative when replacing tubes no longer useful.

Insofar as equivalents are concerned, you know that they exist in most of the categories—glass, metal, loktal, etc., and that one type can be used to replace another providing due consideration is given to socket types and socket connections. In some instances, of course, substitution can be made with no changes in sockets or socket connections.

For your benefit, we have published in connection with this article a chart of equivalent types, to assist you in making substitutions when that may prove necessary. It goes without saying that glass types may require shielding, and that loktal or lock-in types will require a change in the type of socket and probably the socket connections. The latter is easily determined by looking up the socket connections in your tube manuals.

ALTERNATIVES

No hard and fast rules can be provided in connection with the use of alternative types; that is, the substitu-

tion of a tube that is not the equivalent of the tube to be replaced. For instance, the 6C8G and the 6F8G are not equivalents, for their characteristics are not identical (even though their socket connections are). But it is obvious that in a pinch, one could be used in place of the other, even though the heater current of the 6F8G is higher. Or, if the receiver power transformer did not appear to have a sufficient safety factor, a 6C8G could be replaced by a 6SC7, with a change in socket connections and (if necessary) a reduction in voltage gain. Proper resistor values, etc., can be obtained from the now commonly-used "Resistance-Coupled Amplifier Chart" appearing in the back of the RCA Receiving Tube Manual.

FLEXIBILITY FACTOR

The point we wish to make is that, where necessity is a factor, some tube type can usually be found that at least approaches the characteristics of the tube to be replaced. The gain may be lower or higher, a different value

(Continued on page 19)

NAVY SEEKS RECRUITS FOR RADIO AND COMMUNICATIONS

AN opportunity for radio "hams" and technicians to serve their country in Class V-6 of the United States Naval Reserve and, at the same time, receive valuable training is being offered by the Navy Department, which is seeking several thousand recruits for one of its newest operations branches.

Qualified applicants will be enlisted immediately as Radiomen, Second Class, which is equal to four full promotions over original enlistments as apprentice seamen. Radiomen Second Class receive a base pay of \$72 per month and allowances while on duty as technicians and Radar maintenance men. Applicants must be high school graduates and must hold, or have held, Amateur Class "A" or "B" licenses. If applicants lack the license qualifications, they must be actively engaged in radio repair or service work, or have had experience with high frequency design, transmission or reception. They do not necessarily have to be familiar with Morse or other codes.

Men enlisted west of the Mississippi

River will be ordered to the Naval Radio Training School at Los Angeles, California, for a course in Naval Communications. Those enlisted east of the Mississippi River will be trained at the Naval Radio Training School at Noroton, Connecticut. After February 1, students will be sent either to the San Francisco Radio Material School or to the Radio Material School at Bellevue, D. C., until the capacities of the two institutions are filled.

After training, students will have a chance for advancement in rating up to that of Chief Radioman, which carries a base pay of \$99 per month.

"Radar" men will operate the newly perfected radio device which locates planes in flight, the delicate and complicated instrument developed in England and used with such meritorious success by the Royal Air Force. The patents have been turned over to the United States by Great Britain. Details of the device are being kept a deep secret, but it is said to have been used both on the ground and in the air, and is a vital addition to the nation's defense armory.

EQUIVALENT TUBE CHART*

"Lock-In"	"GT"	"G"	Metal	Description
1LA4	1A5GT	1A5G	.....	Power Amplifier Pentode
1LA6	1A7GT	1A7G	.....	Pentagrid Converter
1LB4	1T5GT	.....	.....	Power Amplifier Pentode
1LC5	(1N5GT)	(1N5G)	.....	R-F Pentode
1LC6	(1A7GT)	(1A7G)	.....	Pentagrid Converter
1LD5	(1H5GT)	(1H5G)	.....	Diode Audio Pentode
1LE3	.....	1E4G	.....	Medium Mu Triode
1LH4	1H5GT	1H5G	.....	Diode Triode
1LN5	1N5GT	1N5G	.....	R-F Pentode
7A4	6J5GT	6J5G	6J5	Medium Mu Triode
7A5	(25L6GT)	(25L6G)	(25L6)	Beam Power Amplifier
7A6	.....	6H6G	6H6	Duodiode
7A7	6SK7GT	.....	6SK7	Remote Cutoff R-F Pentode
7A8	.....	6D8G	.....	Octode Converter
7B4	6F5GT	6F5G	6F5	High Mu Triode
7B5	.....	6K6G	.....	Power Amplifier Pentode
7B6	6SQ7GT	6SQ7G	6SQ7	Duodiode High Mu Triode
7B7	(6SK7GT)	6S7G	(6SK7)	Remote Cutoff R-F Pentode
7B8	6A8GT	6A8G	6A8	Pentagrid Converter
7C5	6V6GT	6V6G	6V6	Beam Power Amplifier
7C6	.....	(6T7G)	(6SQ7)	Duodiode High Mu Triode
7C7	.....	6W7G	(6SJ7)	Sharp Cutoff R-F Pentode
7E6	.....	6R7C	6R7	Duodiode Medium Mu Triode
7E7	6B8GT	6B8G	6B8	Duodiode Pentode
7F7	.....	6C8G	6C8	High Mu Duotriode
7G7/1232	.....	.....	(6AC7/1852)	Sharp Cutoff R-F Pentode
7H7	.....	.....	(6AB7/1853)	Semi-Remote Cutoff R-F Pentode
7J7	.....	6J8G	.....	Triode Hexode Converter
7L7	.....	.....	(6AC7/1852)	Sharp Cutoff R-F Pentode
7N7	.....	6F8G	6F8	Duotriode Medium Mu
7Q7	6SA7GT	.....	6SA7	Pentagrid Converter
7R7	.....	(6B8G)	(6SF7)	Duodiode Pentode
7V7	.....	.....	(6AC7/1852)	Sharp Cutoff R-F Amplifier
7Y4	.....	6X5G	.....	Duodiode Rectifier
7Z4	.....	.....	(5Z4)	Duodiode Rectifier
14A7/12B7	12SK7GT	.....	12SK7	Remote Cutoff R-F Pentode
14A4	12J5GT	.....	.....	Medium Mu Triode
14A5	(6V6GT)	(6V6G)	(6V6)	Beam Power Amplifier
14B6	12SQ7GT	.....	12SQ7	Duodiode High Mu Triode
14B8	12A8GT	.....	.....	Pentagrid Converter
14C5	.....	(6V6G)	(6V6)	Beam Power Amplifier
14C7	.....	.....	(12SJ7)	Sharp Cutoff R-F Pentode
14E6	.....	.....	12SR7	Duodiode Medium Mu Triode
14F7	.....	.....	(12C8)	High Mu Double Triode
14H7	.....	.....	(6AB7/1853)	Semi-Remote Cutoff R-F Pentode
14J7	.....	(6J8G)	.....	Triode Hexode Converter
14N7	.....	.....	(6F8)	Medium Mu Double Triode
14Q7	12SA7GT	12SA7G	12SA7	Pentagrid Converter
14R7	.....	.....	(12SF7)	Duodiode Pentode
14Y4	.....	(6X5G)	.....	Duodiode Rectifier
35A5	35L6GT	35L6G	.....	Beam Power Amplifier
35Y4	35Z5GT	.....	.....	Diode Rectifier with Pilot Tap
35Z3	35Z4GT	.....	.....	Diode Rectifier
50A5	50L6GT	.....	.....	Beam Power Amplifier

*If no exact equivalent exists type given in parenthesis designates nearest equivalent, independent of heater voltage.

Chart courtesy of Hygrade Sylvania Corporation

Serviceman's Diary

J. P. Hollister

TUESDAY—Just one look in the window and you could tell it was getting close to Christmas. Not yet nine o'clock, but you could see Jerry already struggling with the red and white streamers, paper bells, and the cotton which he sprinkles with some sort of metal flakes which make it look like snow. He squawks a lot every time he has to fix up the windows, but I really think he likes the job because he takes a lot of pains with it. When I came in he was up on the step-ladder hanging one of the wreaths.

"Can't I help you hang the mistletoe in place?" I suggested, hoping to get a rise out of him. I did.

"Sure you can," he growled. "Just pin it above the seat of my pants. After you get through, if you feel like doing something else, you might get busy and make a few of the calls which you can observe hanging on the hook.

And don't jaw around with the customers today—you know we're both going to be plenty busy tonight with all our loyal customers piling in at the last minute to see if they can't get a bigger discount here than they can get in the city."

He's about right, at that. But it isn't going to be so bad this year—not with everyone thinking in terms of shortages, and not expecting too much. But I didn't want him to get away with a good crack.

"Gosh!" I protested. "Can't you have a little Christmas spirit? They aren't all like that!"

"No?" he replied. "Then tell me how you make out with your dear friend with the big Stromberg which you worked on about a month ago. She's in again!"

He motioned toward the call slips hanging on the hook. I picked off the

top one and glanced at the name. A call-back on an old grouch who put something over on us last Thanksgiving.

"Hey!" I yelled. "Are you nuts? What's the idea of promising this job for today when you know we're going to be rushed to death? Furthermore you also know that she beat us out of a volume control replacement charge. I thought you had more sense—"

Jerry looked positively happy. "Christmas spirit," he said sweetly. "Didn't you say something about Christmas spirit?"

He likes to rub it in. Suppose I did slip up on this job—so what? You've got to trust a customer once in a while. After all, she claimed that the set played perfectly before it suddenly went dead, so how was I to know it needed a new volume control in addition to the condenser replacement? And now she wants to hang us with something else . . .

"Wait!" said Jerry. "Don't take it so hard. I'll lock up and run along with you on this job. You've got to be hard-boiled with some of these dames and I'm the guy to handle that sort of work."

I felt a little better. At least, he'd get an idea what we're up against on the outside.

It was only about a ten-minute drive up to the Markham home, one of the swellest on the hill. I remembered that she had squawked about my coming in the front way, so I started to drive around to the rear, but found the driveway blocked. I was going to back up to the street, but suddenly the door opened and the old dame herself poked her head out.

"You boys just leave your car there and come right in," she said, cheerily.

I looked at Jerry and he looked at me and grinned. We both wondered what had come over her.

She led us into the living room and asked us to sit down.

"You know," she said, "I tried to phone you a few minutes ago, but there was no answer. It seems the maid accidentally disconnected the radio yesterday when she was cleaning. My son, who has just arrived home from engineering college for the Christmas holidays, saw what was wrong immediately. I told him of the other trouble we had, and he said you were perfectly right about the volume control. So I want to apologize and

(Continued on page 19)



"Can't I help you hang the mistletoe?"
"Sure you can," he growled. "Just pin it above the seat of my pants."

CIRCUIT COURT

F-M SILENCER

A UNIQUE arrangement for killing noise while tuning between stations in the f-m band is incorporated in the new *General Electric* LF-115 and LF-116 receivers. The components involved are shown in the accompanying diagram.

This circuit operates on amplitude-modulated noise to produce squelch or quieting of the audio amplifier. Since the 6SH7 2nd limiter circuit can only function as a noise limiter when an f-m carrier is present, noise between stations will ride through with undiminished amplitude. This amplitude-modulated noise appears in the 2nd limiter plate circuit and develops a voltage across the plate resistor R_{35} . This voltage is fed to one of the diodes of the 6SQ7 a-m detector and am-fm first audio tube through the condenser C_{63} and the resistor R_{33} . The voltage is rectified by the diode and then applied to the grid of the triode section of the 6SQ7 provided the switch S_6 is open. This rectified d-c voltage is sufficient to completely bias off this audio tube so that no signal is passed.

When a sufficiently strong f-m signal is tuned in so that the 6SH7 noise limiter tube is driven to plate-current saturation, the noise or amplitude signal is reduced so low that the proper bias (as determined by contact potential) is restored to the 6SQ7 audio amplifier and the audio signal is then

passed through to the output and phase-inverter circuits.

This squelch voltage can be manually removed by closing switch S_6 so that weak f-m stations that have considerable noise present can be received if desired.

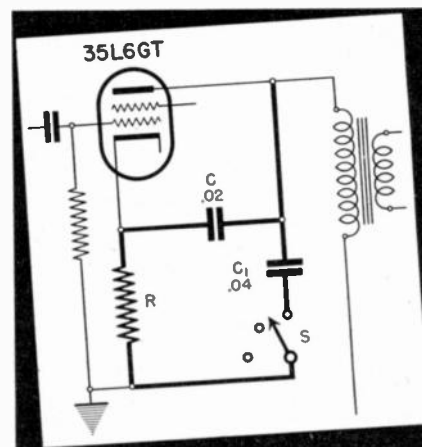
FEEDBACK TONE CONTROL

THOUGH NOT A NEW application, the tone-control circuit in the *Stewart-Warner* 206DS and 206ES chassis is of interest. It is common to the plate and cathode circuit of the 35L6GT power tube, as shown in the accompanying diagram.

The 3-position switch is coupled to the range switch, and provides "high" tone in the short-wave position, and either "high" or "low" tone in the broadcast position.

With the tone switch in either of the first two positions, the cathode resistor R is unbypassed; hence, constant-current degeneration is provided—with additional, constant-voltage degeneration from plate to cathode via the .02-mfd condenser C .

Since either or both types of degeneration reduce gain, the gain at any given frequency will depend upon the reactance of condenser C at that frequency. For instance, a .02-mfd condenser has a reactance of approximately 80,000 ohms at 100 cycles, and approximately 3500 ohms at 3000 cycles. Hence, there will be less feed-



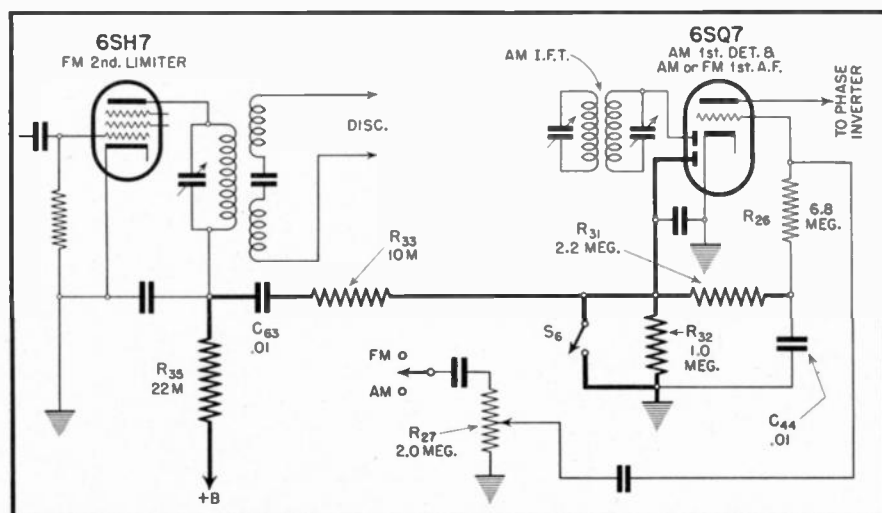
back by this means at 100 cycles, and therefore less degeneration and more gain at this frequency than at higher frequencies. This condenser may be assumed as establishing the desired audio range for the receiver.

Now, moving the switch to the third position grounds the .04-mfd condenser C_1 —and this does two things; it diverts a certain amount of audio voltage from plate to ground and, in series with C , serves as a bypass around the cathode resistor R . This value of capacity, of course, is small in comparison to the usual value employed for an audio cathode bypass, but it does decrease degeneration slightly at the higher frequencies.

But of importance insofar as low frequencies are concerned, is the diversion of audio voltage by condenser C_1 . To begin with, its reactance at 100 cycles is only 40,000 ohms, as against 80,000 ohms for C ; and only 1300 ohms at 3000 cycles, as against 3500 ohms for C . Hence, it not only serves as a low-resistance path to ground for the higher frequencies, thus reducing the high-frequency response, but also reduces the degree of degeneration at the lower frequencies as it offers less reactance to these frequencies than does the feedback condenser C .

DUAL F-M CONVERTER

THE SWITCHING arrangement in the new *General Electric* LF-115 and LF-116 a-fm receivers does tricks with the front-end tubes, as may be followed in the accompanying diagram.



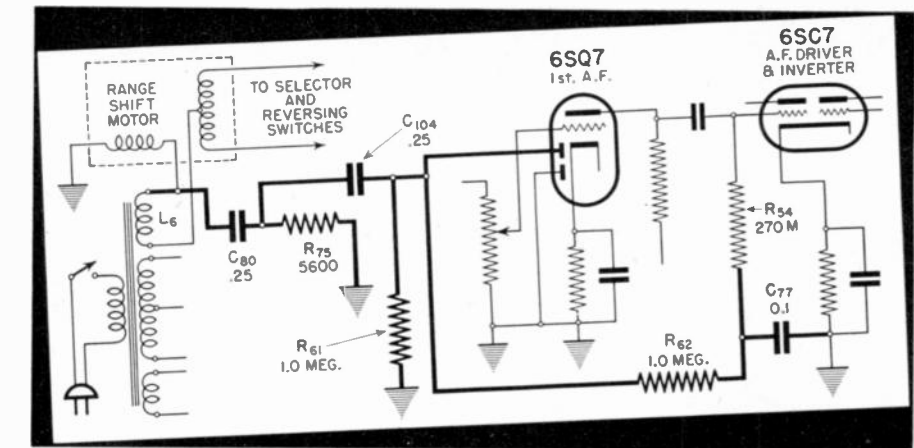
The first 6SG7 tube acts as a conventional r-f amplifier when operating in the a-m short-wave or broadcast bands. However, in order to obtain optimum gain, the above tube becomes the first converter of a double or cascade converter system when operating in the f-m band.

This cascade converter system consists of the two 6SG7 converter tubes and a 7Q7 oscillator tube, with their associated circuits. The tuning condensers for the two converters and oscillator are low-capacity sections and ganged together as usual.

The antenna tuning circuit consisting of *T5* and *C3* tunes the f-m band from 42 to 50 mc; the second converter tuned circuit consisting of a portion of *T6* and *C29* tunes from 23.15 to 27.15 mc; while the oscillator tuned circuit consisting of *C5* and a portion of *T7* tunes from 18.85 to 22.85 mc. The oscillator voltage is capacity-coupled to the grid of the first converter tube through *C7*.

This produces, by heterodyne action, a signal to which the plate circuit of this first converter is tuned. The first converter tube also provides a gain of unity for the oscillator frequency. Accordingly, oscillator voltage is also applied to the grid of the second 6SG7 converter tube which produces in its plate circuit the i-f frequency of 4.3 mc.

To illustrate the action, consider an f-m signal of 42 mc to which the receiver is tuned. The oscillator fre-



quency for this setting of the tuning control is 18.85 mc and it heterodynes in the first converter tube with the 42-mc signal to form 23.15 mc (42 minus 18.85). The 23.15-mc signal, in turn, beats with the oscillator signal in the second converter to produce the 4.3-mc intermediate frequency.

ELECTROMATIC RANGE SHIFT

AN ARRANGEMENT known as the "Electromatic Range Shift," which gives automatic and noiseless range selection, is provided in the new Stromberg-Carlson No. 935 series of receivers. A motor is used for this purpose, and the circuits involved are shown in the accompanying diagram.

A separate winding, *L6*, on the power transformer, supplies the motor. Closing any one of the range switches involved places the motor in operation. This immediately develops an a-c voltage across the resistor *R75* in series with the grounded end of the power transformer winding *L6*. This voltage is applied to one of the diodes of the 6SQ7 1st audio tube, where it is rectified. The resultant d-c voltage appears across the resistor *R61*, and is applied as a bias to the input grid of the 6SC7 audio driver and inverter. It will be seen that the resistor *R61* forms a part of a voltage divider *R54*, *R62*, *R61* between grid and ground.

When the motor has driven the range switch to the proper position, it is shut off automatically, thus removing the limiting bias from the input grid of the 6SC7. Hence, during range-shift operation, the input triode section of the 6SC7 is biased to a point where gain is sufficiently reduced to prevent the passage of noise. As soon as the operation is completed, the limiting bias is completely removed and the normal gain of the input triode of the 6SC7 is restored.

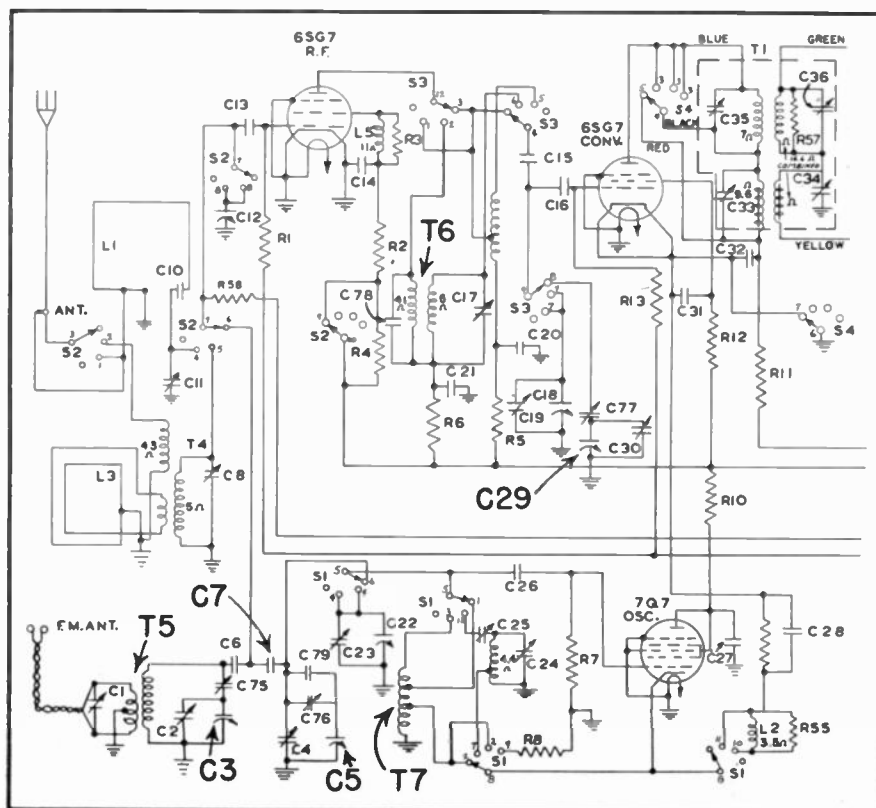
As a matter of interest, one section of the range switch controls four indicator lights, one for each range.

BALANCED INVERTER

THE SO-CALLED "self-balanced" phase-inverter circuit appears in improved form in the new General Electric LC-758 receiver, as shown in the accompanying diagram. (See continuation.)

In this type of circuit a portion of the output of the "inverter" section of the 6SC7 tube is common to its input, due to the out-of-phase voltage developed across resistors *R22*-*R21*. Since the grid is connected to the juncture of these two resistors, and has impressed on it the out-of-phase voltage developed across *R21*, the circuit is degenerative.

(Continued on page 18)



Set of the Month—

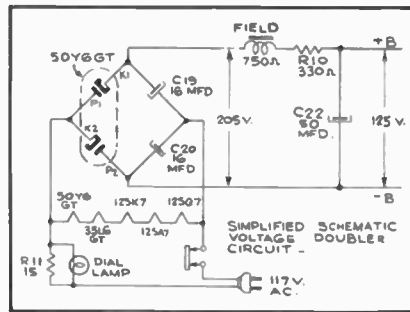
Radiola Electrola R-566P

Of special interest this month is the new *RCA Automatic Radiola Electrola*, Model R-566 P, exclusively designed for servicemen to sell. As compact as it is, it houses a complete receiver and a full-fledged automatic record changer, and has a maximum power output of 3 watts, which is adequate for the average living room. The record changer employs the new RCA light-weight crystal pickup with built-in sapphire, thus obviating the need for needle changing. All records can be played with the cabinet lid closed.

THE CIRCUIT

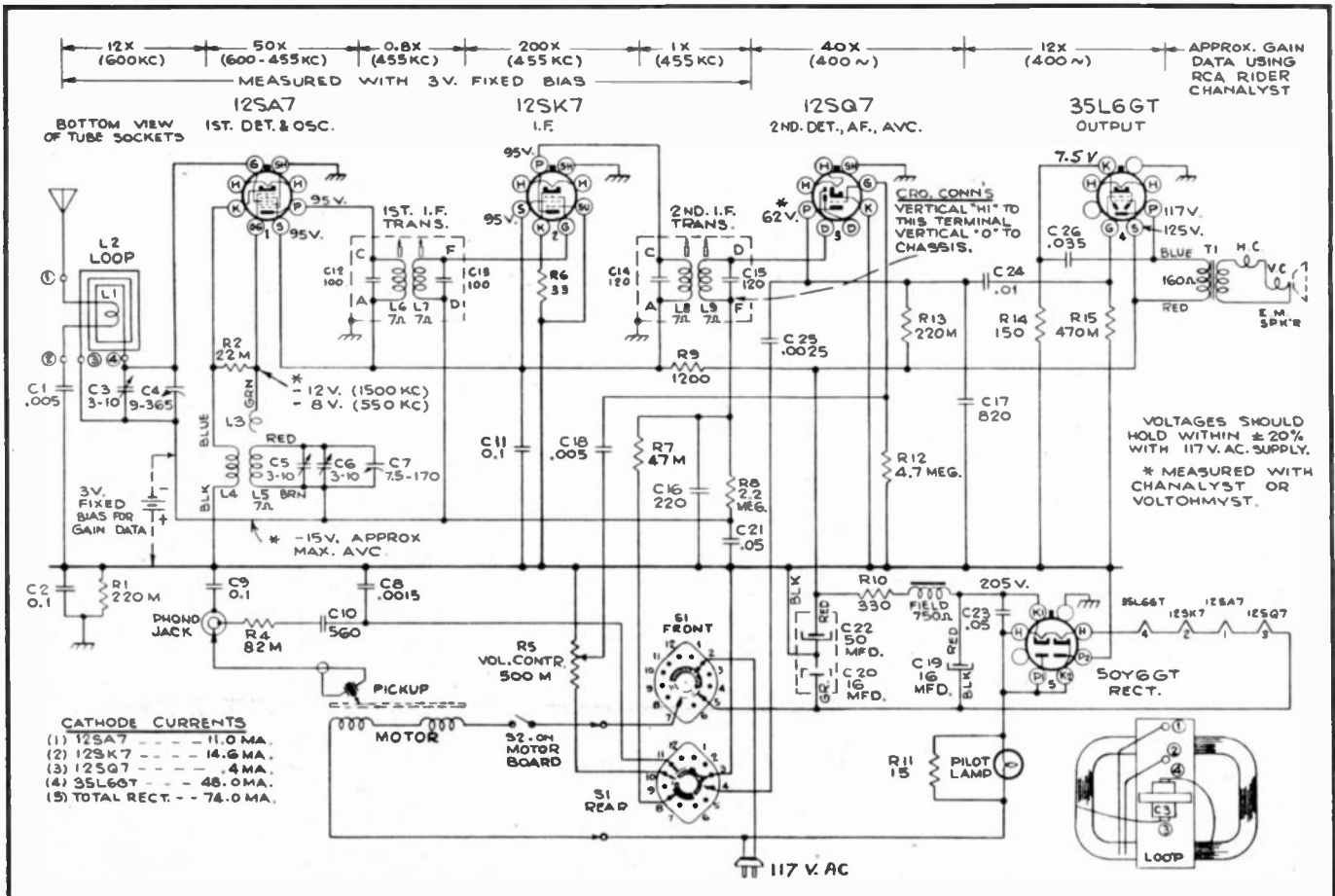
The complete diagram of the R-566 P is shown at the bottom of this page. The receiver circuit proper is conventional, but there are a few other points worth noting. Of most importance is

Right: The RCA Model R-566P. Below: Fig. 1. Simplified version of the voltage-doubling power-supply circuit.



the power supply, which employs a voltage-doubling circuit. A simplified version of this is shown in Fig. 1. The filter is comprised of the voltage-doubling electrolytics *C19* and *C20*, the speaker field, the voltage-limiting resistor *R10* and the output electrolytic *C22*.

It will be noted that the rectifier is a 50Y6GT, which does not have a tapped (Continued on page 18)



The RADIOFRONT

KARL A. KOPETZKY

THE OTHER FELLOW'S YARD

WE made it our business this past month to interview a great number of servicemen. We wanted to find out what they were thinking about business in general. Most of the *employed* men met us with a statement which went something like this.

"Oh boy, oh boy! Just wait till I get my hands on one of them 'thar' defense jobs!"

When we asked them why they were going over to defense jobs, the answer invariably was, "more money." Inquiry elicited the fact that these men were earning between \$35 and \$60 a week at their present jobs, were making more money than they had in years, and had more work to do than they had ever seen.

Perhaps, we figured, there might be something there. So we made a survey of the defense jobs from the monetary standpoint. Here is what we found:

Company A, located in the east, pays 40 cents an hour for grade C testers, 60 cents an hour for grade B, and \$1.10 for grade A. That makes \$16, \$24 and \$44 per week for each job respectively. The grade A tester was required practically to be a graduate Electrical Engineer, while the other two grades required only that the man be able to read a meter. Not much of an advance there over the money you servicemen make.

Company B, located in the middle west, pays testers (from servicemen ranks) 90 cents an hour, or \$36 a week. Company C, in the far west, pays 65 cents an hour or \$26 a week. Company D, on the eastern seaboard, is paying 50 cents an hour or \$20 a week, while Company E is paying a flat \$25 a week salary. Not much of an advance there!

In the services of Uncle Sam, the pay is slightly higher. It ranges from \$185 to \$300 a month, with the last bracket reserved to engineers who can prove it.

Our survey leads us to state that, while the other fellow's yard almost always seems a bit greener than your own, "all ain't what it's cracked up to be." Not that those who feel that they really want to get into defense should not do so. There will always be some whose *patriotic* motives lead them to accept a sacrifice, but don't think that just because there is a big hullabaloo, that there is BIG pay in defense. De-

fense, also, is a *business*; and as such pays only that sum which the job warrants!

AFTER THE EMERGENCY, WHAT?

Another thing. Have you servicemen given a thought to the fact that the Army and the Navy is daily training literally thousands upon thousands of servicemen? When the emergency is over, these men will be released and their number will be added to your own to try to eke a living from your very own customers! If you, too, leave your "home stand" to join the ranks of defense, (when there are plenty

BEFORE YOU READ "RADIOFRONT"

● Mr. Kopetzky completed "RadioFront" for this issue prior to our declaration of war. War came as his column was being set in type.

Though there has been sufficient time to edit "RadioFront", and changing "emergency" to read "war", we were so impressed by the foresight shown by Mr. Kopetzky that we preferred to leave the column stand.

In reading it, substitute the word "war" for "emergency", and you will find that no major alterations are required.

There is just one point we wish to stress—a point that Mr. Kopetzky would have stressed had he known that war was to have come so soon and with such suddenness. The point is this: Your country now needs you more than ever, but it is for you to decide where you can do the most good. Some of us have to man the home front, for the home front is equally as important as the war front. Receivers *must* be kept in repair. To you who stay—"Keep 'em Operating."—The Editor.

there already), what chance will you have against the men who stay and develop your market? And what chance will you have to come back into your community, with the other thousands, to set up your business again.

None—brother—practically none!

Once again let us state, unequivocally, that for the young man, without dependents, physically fit, and yearning for adventure, the Military or even a defense job is OK. But for you oldsters, you men who have survived two depressions, who have built up a business by the sweat of your brow—don't leave it for what you think are greener fields!

Your big chance is right now, and at home!

You should start to educate the public that there is a whale of a difference between a serviceman whose work for years has been repairing the public's

receivers, and the youngster whose training, good though it may have been, has been on transmitters, telephones, communications jobs, and the like. You should show the public that the ills which beset their radios, while of the same family as those with which the Army has to contend, are nevertheless of such a nature that a man superbly trained in the handling of that particular type of trouble, is the only person who can do a really good repair job!

That will be your *insurance* against the inroads which the men eventually released from the services will try to make in your profession!

PRICES, PRICES, PRICES

One hears much about price control. Yet the only price control in which you should be interested is that pertaining to your business. That there will be price control in the radio field, is a foregone conclusion. This should result in a slackening in the sales of new sets. Not only that, but there may be a *curtailment in the production* of new sets. To you servicemen, this means money in the till! With new sets curtailed, the public will have to have its older sets put in order. And you are the men who are going to do this. So educate your market to the fact that you, too, have to pay higher prices for your living, for your parts, which are getting scarcer and at the same time more expensive. It is not good sense to make a replacement with an inferior part. Ask that your trade wait until you can get that better-made part. It will not only create an impression in the mind of your customer that you are a man who knows his business, and not a gyp, but will show him that there is no reason why, with everything else going up, he should expect the *same old* prices from the serviceman.

This is your opportunity to make a bit of money, honestly!

This is your chance to put your own business on the same plane with the large firm!

This is your chance to establish yourself as a business which is not just a "junk-heap in charge of an incompetent," but a reliable shop where sound business principles are followed!

Silly though it may sound, there are very, very few servicemen who have figured out some very obvious busi-

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Zenith 4K600 Poketradio	May	15	RCA V-205, -405, VHR-207, -407: Radio breakthru on phono	Mar.	20
SHOP NOTES			RCA V-301, -302: Motor noise	June	34
<i>(Also see "Tubes")</i>			RCA VHR-202, -207, -407: Rumble	Jan.	19
Analysis of Radio Interference Phenomena	July	11	RCA VHR-207, -407: 12K6 burnouts	Jan.	19
Crosley 52FA, 62FA, 62FB: Short life of 1T5GT	Dec.	15	RCA Wave-Trap Data	Mar.	21
Emerson EC & EC1 Chassis: Wiring change	July	10	Sapphire Phono Styli: Distortion, noise	Sept.	10
Emerson FU-424, -427, -428: Rectifier tube	May	20	Sapphire Phono Styli: Tip radius	Nov.	14
Farnsworth BK-77, -78: Circuit changes	Apr.	22	Silvertone 3011, 3111, 3211: Changes	July	10
Farnsworth BKR-84: Recording howl	May	20	Silvertone 3611, 3711, 3811: Changes	July	10
Farnsworth BT-52, -53, -54, -55, -56: Circuit change	Apr.	22	Silvertone 6306: Extended range	Apr.	22
General Electric Models 60 & 80: Audio howl	June	20	Silvertone 6490-B: Component change	Apr.	22
General Electric L-640: Bypass connection	Oct.	18	Silvertone 7325 Export: Bandsread alignment	Feb.	23
General Electric LF-115, -116, LFC-1118, -1128, -1228: Replacement of components, pointer focusing, rotor balance spring	Dec.	15	Silvertone 7327: Alignment precaution	Feb.	23
Hum: With 6AD7-G tube	Dec.	15	Stewart-Warner 5R Chassis: Increasing sensitivity	Feb.	36
Microphonics in Portables	Aug.	14	Stewart-Warner 206G: Dry-cell charging	Oct.	18
Montgomery Ward 14WG-683: Issue B change	Oct.	18	Stewart-Warner 1941 Series: Repairing On-Off indicator	Aug.	14
Montgomery Ward Recorders: High-pitch playback	Nov.	14	Stewart-Warner Xtal Pickups: Soldering	Jan.	19
RCA 1X, 12X, 14X: PM to EM speakers	Sept.	10	Stromberg-Carlson 520: Reducing highs	Jan.	19
RCA 7QB: Transformer polarity	Jan.	19	Stromberg-Carlson No. 555: Service notes	June	20
RCA 14AX, 14AX-2: 2nd production changes	Dec.	15	Stromberg-Carlson Changer: Record squeak, jams	Oct.	18
RCA 14BT Series: Regeneration	Mar.	20	Temperature Compensating Capacitors: Applications	Nov.	14
RCA 15X, 16X Series: Residual hum	Mar.	20	Truetone 5B4-2 (Model D-1180): Issue B change	Nov.	14
RCA 16T2, -T3, -T4: Production changes	May	20	Truetone 7D9-2 (Model D-1118): Issue B change	Dec.	15
RCA 25BK, 25BT3: Minimum volume	Nov.	14	Wards Airline O4BR-389T: Voltage readings	May	20
RCA 25BT3: Hum modulation	Sept.	10	Wards Airline 14WG-808W, -M: Bandsread coils	Nov.	14
RCA 26X, -1, -3, -4: 2nd production changes	Dec.	15	Wells-Gardner Auto Radios: Ignition noise	June	20
RCA 28T: Condenser changes	Dec.	15	Wells-Gardner 5D8-1: Antenna trimmer	Oct.	18
			Wells-Gardner 5D8-1: PM to ED speakers	Nov.	14
			Wells-Gardner 6A43-1, -3: Hum performance	Feb.	23
			Wells-Gardner 6C17, -18: Improved performance	June	20
			Wells-Gardner 6D3-1: Eliminating oscillation	June	20
			Wells-Gardner 9A46: Issue C changes	June	36
			Wells-Gardner 9A46: Issue D changes	June	36
			Westinghouse M-102: Cabinet touch-up	Oct.	18
			Wilcox-Gay Record Players: Motor lubrication	May	20
			Wilcox-Gay A-72 Recordio: Audio oscillation	Mar.	21
			Wilcox-Gay A-89, -91, -92, -93, -94: Pickup shunt resistor	Apr.	22
SIGNAL GENERATORS			<i>(See "Servicing Equipment")</i>		
SIGNAL TRACING			New RCA Gain Data Instructions		
			Oct.		11
SOUND			<i>(See "Public Address")</i>		
TECHNICAL SERVICE PORTFOLIO			Section VII—Microphones & Pickups		
			Jan.		15
			Section VIII—High-Fidelity Receivers	Feb.	15
			Section IX—Coil and Condenser Testing	Mar.	15
			Section X—Biasing Methods	Apr.	15
			Section XI—Modern Alignment Methods	May	11
			Section XII—Visual Alignment	June	13
			Section XIII—Replacement Parts Problems	Aug.	9
			Section XIV—New RCA Gain Data Instructions	Oct.	11
TESTING			<i>(See "Servicing")</i>		
TEST OSCILLATORS			<i>(See "Servicing Equipment")</i>		
STONE			Compensation		
			Frequency Compensation	Feb.	16
			Frequency Correction	Aug.	12
			Low-Pressure Phono Pickups, by G. S. Granger	Feb.	5
			Phono Response	Jan.	23
Control			Four-Way Tone		
			May		19
			Low-Pressure Phono Pickups, by G. S. Granger	Feb.	5
TUBES			New Types		
			3Q4	May	20
			5Y3GT/5Y3G	July	10
			6SF7	Apr.	22
			6SG7	Mar.	20
			6SL7-GT	Apr.	22
			6SN7-GT	Apr.	14
			6SS7	June	20
			12SF7	Apr.	22
			12SG7	Mar.	20
			12H6	June	20
			12SL7-GT	July	10
			12SN7-GT	June	20
			45Z3	May	20
			117P7-GT	June	20
			931	June	5
			1629	Feb.	23
			1631	Aug.	14
			1632	Aug.	14
			1633	Aug.	14
			1634	Aug.	14
Tube Operation			Equivalent Type Tube Chart		
			Dec.		6
			KP and G—Part I, by John F. Rider	Oct.	6
			KP and G—Part II, by John F. Rider	Nov.	5
			Microphonics in Portables	Aug.	14
			Performance Ratings—Part II, by John F. Rider	Sept.	5
			The 931 Multiplier Phototube	June	5
			6L6 Instantaneous Plate Voltage	June	33
			6SF7 Circuit	May	18
V-T VOLTMETERS			<i>(See "Servicing Equipment")</i>		

NEW PRODUCTS

OF THE MONTH

AEROVOX

Oil-Filled Plug-In's—New Series —72 oil-impregnated oil-filled capacitor with four-pin base that fits into a standard UX socket, as distinguished from the octal base of other plug-ins.



The aluminum-sprayed tin-plate round can comes in 2, 2½ and 3" diameter sizes, and from 2½ to 4¾" high. It is provided with a mounting ring with lugs, so as to be held securely in place and in accordance with Underwriters requirements. These oil-filled plug-ins are available in single-section units up to 16 mfd., and up to 4-4-4 mfd. in multiple-section units, in both the 400 and 600 v. D.C.W. ratings.

These plug-in oil-filled capacitors are particularly desirable for equipment used by the Army, Navy, police, broadcast stations, public address and sound movie systems. They are ideal for aircraft radio where duplicate receivers and transmitters are not available but where prompt servicing of single units is absolutely essential. The UX base insures the correct insertion of the capacitor into the circuit. By Aerovox Corp., New Bedford, Mass.

★

MECK

"Mirror-Tone"—A new line of "Mirror-Tone" home phonographs, attractively



covered with brown tweed aero-cord, the "Bar Harbor" model, has a built-in automatic record changer which will play a half-hour program of 10 or 12 inch records.

The case of this table model is acoustically resonated to provide finer tone quality. One ounce low pressure crystal pick-up and high fidelity amplifier with specially matched speaker are included. By John Meck Industries, 1313 W. Randolph St., Chicago.

★

TURNER

Dynamic Mike—Model No. 211, for radio stations, loudspeaker systems, etc. Utilizes a new type magnet structure and acoustic network, offering outstanding performance characteristics. The salt-shaker type is dictated by these two features.

High frequency range extended and the extreme lows have been raised 2 to 4 decibels, to compensate for over-all deficiencies in loudspeaker systems. The unique diaphragm structure results in extremely low harmonic and phase distortion, without sacrificing high output level.



Equipped with tilting head, balanced line output connection and 25 feet of heavy-duty cable. It is finished in rich satin chrome. By The Turner Co., Cedar Rapids, Iowa.

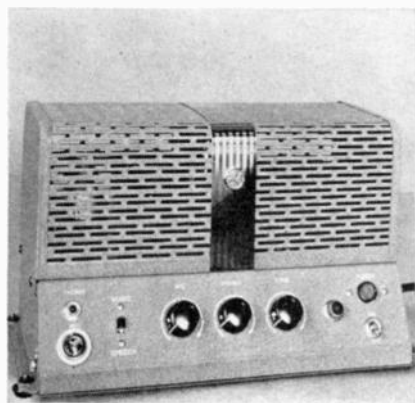
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RCA

15-Watt Amplifier—A newly developed 15-watt amplifier which achieves an increase in operating efficiency when compared with an earlier model it replaces.

While rated at 15 watts, the new unit is capable of 21 watts of output as a maximum. At its rated output, distortion is less than 3½%. Provision is made for microphone and phonograph inputs, the former at 560,000 ohms, and latter at 500,000 ohms. A terminal board is provided for making output connections.

Separate volume controls are supplied for the microphone and phonograph inputs. A continuously variable tone control and voice-music switch are also incorporated.



Gain of 125 db is provided for the microphone input, 85 db for phonograph. Frequency response is from 30 to 10,000 cycles. Dual control intro-tube mixing is another feature of the new unit. The fuse is easily accessible. A microphone plug is furnished with the unit.

Designated as Model MI-12222, it is housed in an attractively styled cabinet of modern lines, painted a neutral grey. Its dimensions are 14½" long, 8¾" deep, and 8½" high. By RCA Mfg. Co., Inc., Camden, N. J.

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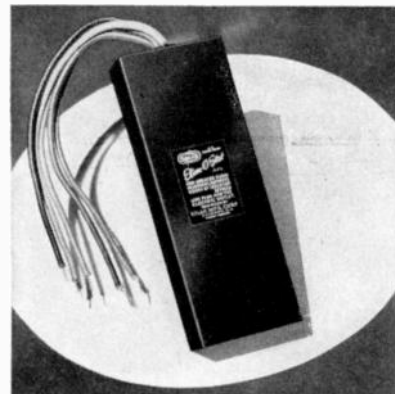
DUOTONE

Needle Sharpener—New simple cactus needle sharpener utilizes the turntable of the phonograph like an emery wheel. Sharpens needles in record time. By Duotone Co., 799 Broadway, New York, N. Y.

★

SOLAR

Noise Suppressor—Type AFL "Elim-O-Stat," specifically designed to eliminate radio interference created by fluorescent lighting equipment. It is supplied in a small, narrow metal case for channel mounting. By Solar Manufacturing Corp., Bayonne, N. J.



Shop Notes

CROSLEY MODELS 52FA, 62FA, 62FB

Short Life of 1T5GT

A few of these receivers were received in the field with the wrong "Battery A.C.-D.C." Switch installed in them. Turning the switch from the "Battery" to "A.C." operation, and vice versa, with the power cord connected would, in some instances, cause the 1T5GT tube to be short-lived.

This condition can be corrected by repositioning leads as follows:

1. Remove wires soldered to #1 contact and solder to the #2 contact, leaving connection on #2 contact in place on the "Battery A.C.-D.C." switch as illustrated in the wiring diagrams.

2. Remove that section of "ON-OFF" switch which is in series with the lead to #8 contact and place in series with the lead to #5 contact of the "Battery A.C.-D.C." switch.

The above changes, when completed, will correct further occurrence of short life on 1T5GT tubes.

Fuzzy Tone

The high efficiency magnetic speakers used in these battery receivers have provisions for centering the armature should it be necessary. Should complaints be received regarding fuzzy tone, they can be easily corrected by re-centering the armature.

G. E. MODELS LF-115, 116, LFC-1118, 1128, 1228

Replacement of Components

When servicing the f-m portion of this receiver and especially when replacing parts, care should be exercised to return all components including wiring to the original position occupied in the chassis. The positioning of parts and wiring is very critical. When replacing coils or i-f transformers, maintain the lead lengths provided and use the same terminals to which the original coil or transformer was connected.

Pointer Focusing

The focusing of the pointer on the dial scale is accomplished by increasing or decreasing the pointer distance from the dial scale. This is a rather critical adjustment and can be varied enough by loosening the mounting bolts and moving the chassis either back or forward in the cabinet until properly focused and then tightening mounting bolts.

Rotor Balance Spring

On the right-hand side of the tuning condenser assembly is a wire bracket from which a spring is suspended that connects to the drive drum of the tuning condenser. The proper adjustment of this spring counterbalances the weight of the condenser drive assembly and prevents

backlash. For chassis mounted horizontally, as in Models LFC-1118, LFC-1128 and LFC-1228, the spring must be in the rear notch of wire bracket. For the Model LF-115 which has a 20° slope mounting, the spring is fastened in the center notch of the bracket while on LF-116 mounting (30° slope) the spring is in the bracket notch nearest front of chassis.

HUM

With 6AD7-G Tube

Occasionally a type 6AD7-G tube may have internal leakage which produces hum in the receiver. This leakage may be of such a high value that it is difficult to measure, and such tubes will test OK in a tube checker. When this condition is encountered, the tube should be replaced.

RCA U-45, K-105, V-205, ETC.

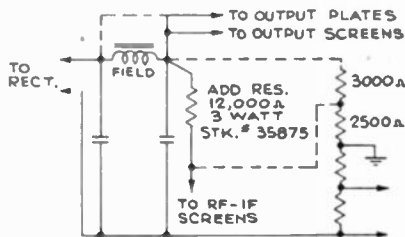
Bleeder Resistor No. 34537

If bleeder resistor No. 34537 becomes defective, the set can be repaired, without replacing the bleeder, by changing the circuit as shown in the accompanying diagram.

This change requires only one part, a 10,000 or 12,000 ohm, 2 or 3 watt resistor (RCA No. 35875).

Procedure:

(a) Disconnect leads attached to 3000 and 2500 ohm sections (leave ground connection intact).



DOTTED LINES INDICATE ORIGINAL CONNECTIONS - TO BE REMOVED.

(b) Change output stage plate supply from the filter input (rectifier side of speaker field, + 350 volts) to the filter output (load side of speaker field, + 250 volts). This can be done at the speaker plug. Leave the output stage screen lead connected to this same point.

(c) Install a 10,000 or 12,000 ohm, 2 or 3 watt resistor (RCA Stock No. 35875) in series between the r-f, i-f screen supply lead and the filter output; being sure that the existing 16 mmfd. capacitor is connected to the screen side of the resistor.

This modification slightly lowers the reserve of power output.

RCA V-175

Low Output and/or Distortion

Check the following:

- (a) Rectifier tube 25Z6GT (slow in coming up to full plate voltage).
- (b) Output tube 25L6GT (usually accompanied by high hum).



(c) Bias cell reversed. The negative side should connect to the grid of the 6SQ7. See accompanying sketch of bias-cell polarity.

RCA 14AX, 14AX-2

Changes in 2nd Production

C3, in grid circuit of 12SQ7, is changed from .015 to .02 mfd., Stock No. 36248.

C5, in 50L6GT plate circuit, is changed from .025 to .02 mfd., Stock No. 36248.

C21, chassis ground to power ground, is changed from .2 to .1 mfd., Stock No. 4839.

RCA 26X-1, -3, -4

Changes in 2nd Production

In 26X-1 and 26X-3, a 10-mmfd. capacitor, Stock No. 13200, is added in parallel to C24 in the "C" band oscillator circuit.

The Stock No. for C4 (47 mmfd.) oscillator grid capacitor is 13141.

The adjustable core on L5 antenna coil is omitted, and this adjustment is therefore omitted in the alignment procedure.

RCA 28T

C13 Connections Changed

In some production, C13, from the plate of the r-f tube, is connected to the switch side of C8 instead of to the grid side of C8.

C51 Deleted

In 2nd production, C51 (22 mmfd.), Stock No. 14021, connected from antenna terminal to chassis, is omitted.

TRUETONE SERIES 7D9-2 (Model D1118)

Issue B Change

Issue A chassis of the above model used an antenna trimmer C2 (2.5-35 mmfd.) mounted on the loop aerial assembly.

On issue B chassis, the antenna trimmer C2 has been removed. The 1400-kc adjustment as given in the alignment procedure in the service manual is omitted. The 1400-kc adjustment is made at the factory and need not be made in the field.

RSA NEWS



NOMINATIONS FOR RSA DIRECTORS

Three RSA Districts will elect representatives to the National Board of Directors of RSA next spring. Nominations, in accordance with the provisions of our bylaws, are now in order and must be received at National Headquarters before February 15, 1942.

Present RSA Directors of these districts are:

District 5 (Iowa and Missouri): *Edward H. Gordon*, LeClaire Hotel, Moline, Illinois.

District 7 (Wisconsin, Minnesota, North Dakota, South Dakota, and the northern peninsula of Michigan): *Fred Olson*, 107 S. Madison Street, Green Bay, Wisconsin.

District 9 (Michigan, excepting the northern peninsula, and Ontario, Canada): *S. W. Christie*, 36 Miller, Pontiac, Michigan.

★

DON'T MISS OUT—

If you haven't sent for your copies of the RCA Victor service notes we told you about last month—over 225 pages of detailed service data on 1938, 1939, and 1940 RCA Victor receivers—better slip the 35c to cover mailing and handling costs in an envelope and mail it pronto to RSA National Headquarters, 1216 W. American St., Freeport, Illinois.

The supply of notes on some models is limited, so it's first come, first served.

★

NAVY NEEDS SERVICEMEN

The United States Navy has asked RSA to aid in bringing to the attention of servicemen the opportunity afforded experienced radio servicemen in the U. S. Navy.

For the first time in history, radio servicemen may enter the service with petty officer rank. Heretofore men with radio training could only join the Navy with initial ratings of apprentice seamen.

Under the present program, the Navy expects to enlist 5,000 men in the near future. Those accepted will be given ratings of radiomen, second class, and will be sent to a naval radio training school at Noroton, Connecticut, and upon completion of the course may be advanced to chief radiomen.

For applications or further information, call or write your nearest Navy recruiting station.

★

CHAPTER CHATTER

Chicago Chapter:

These are times when new and important problems confront our business and yours. This National Emergency has placed the radio serviceman in a bewildering predicament as concerns his planning for the future.

To discuss these problems—to find

solutions to them—the Chicago Chapter RSA held an open meeting November 26, filling the South Ball Room of the Stevens Hotel.

Harold Cunningham, National RSA Treasurer, discussed the question: Can a radio service shop make a satisfactory income for its owner in the light of new taxes, national material shortages, and other problems before us? *Robert L. Shless*, Chicago business and advertising executive, spoke on how the radio serviceman can best use his time and money to build a substantial income during the uncertain period ahead of us. He presented definite plans and thoughts for the betterment of the servicing industry.

Entertainment was provided by personal appearances of two of Chicago's popular radio stars, *Ulmer Turner* and *Betty Ames*.

It was a meeting that accomplished a great deal, a meeting that marks a new era for Chicago Chapter RSA.

—*Al Kilian*, Secretary

★

Danville Chapter:

G. R. McKinney presided at our meeting of November 13th. Program Director *McArdle* had a program on radio terms. He lined the boys up and fired the questions to them. They were sure bewildered—and still are, in fact.

We decided to repeat our last year's Christmas program of repairing donated radios for presentation to others less fortunate than ourselves so they may have a happy radio Christmas. Advertising Chairman *Lyal Cummings* was instructed to go ahead with the publicity, and members were asked to donate a few evenings to this worthwhile project.

The winter term of "School" started with the November 27th meeting. Members were warned, "You can't afford to be without the knowledge ye shall gather."

—*From the "Servicemen's Dirt,"*
Cal. Stapp, Editor

★

Fremont Chapter:

Fremont Chapter held a meeting Wednesday, November 12th, at which *Mr. Arvin* of P. R. Mallory & Co. gave a very interesting talk on vibrators, electrolytics and volume controls, and on that timely subject, priorities. The speaker came through the courtesy of Warren Radio, Toledo. Guests came from Toledo and Sandusky.

—*D. R. Bruns*, Director District 12

★

Interstate Chapter:

Our meeting of November 18th was held at the home of *Harold Anderson*, Moline, Illinois, Vice-President *L. H. Moorhead* being in the chair.

Dr. Harvalik explained in detail the course to be started at St. Ambrose College in preparation for communications

license. Applications were on hand for those wishing to attend.

Nominations for 1942 Chapter officers were made, to be voted upon next meeting. The meeting was then turned over to *Howard Spidel* of the Midwest Timmermann Company, who gave us a complete demonstration of the Chanalyst in conjunction with the RCA Dynamic Demonstrator. This demonstration gave the boys a very good chance to see what this test equipment will do, and answered questions pertaining to the use of the instrument.

The group then retired to a feast of baked ham and all the trimmings—thanks to *Mrs. Anderson*.

—*O. W. Olson*, Secretary

★

Jamestown Chapter:

The Jamestown Chapter is going to hum with activity during the winter season. Events started with a meeting in the YMCA on October 21st, at which time the members adopted the RMS price schedule as a basis for radio repair charges.

On November 11th, talking technicolor moving pictures of the Thaw Asiatic Expedition were presented through the courtesy of ESSO gasoline. On November 25th, the General Motors show on National Defense was presented following the regular meeting. Another of these interesting shows will be given December 15th at the Hotel Jamestown.

General Electric will give a demonstration of frequency modulation at a meeting in December or January; the date has not yet been selected. One or two banquets are being planned and members who fail to attend these meetings are going to miss the best the Jamestown Chapter has ever sponsored.

—*Norman W. Smith*, Secretary

★

LaPorte Chapter:

Our Chapter is getting along fine and it has been a great help ever since we became RSA members. We sincerely hope all Chapters have benefitted as much as we have.

Our meeting of November 12th was held at the YMCA and various ideas and plans were exchanged on how to promote more educational meetings. An outstanding plan was outlined as to how the Chapter could put these over in a big way and without expense.

Our Chapter has adopted Johnstown Chapter's system of chassis marking and we wish to thank them for the idea. We will have ten spaces instead of eight within the circle. This will allow us to break down our estimates a little more.

On December 8th, we are having a Christmas party along with our regular business meeting—more about it next month.

—*Stan Kubit*, Secretary

North-Eastern Iowa:

We had a very nice meeting up here at Waukon last month and had a good turnout; some of the boys from across the river in Wisconsin came over and were very much enthused about the organization. The technical portion of the meeting was a very interesting discussion on the use of various test equipment, the Chanalyst and RCA Dynamic Demonstrator Board being used.

—J. Harold Lindblom,
Temporary Chairman

★

Oklahoma City Chapter:

Excessive rainfall has been slowing up business here this fall, although most service shops report they have all the business they can handle. Many shops have lost their servicemen to the army, navy, or the defense program.

Our Chapter has voted to change from two business meetings per month to one, held on the second Tuesday of each month. Social meetings are to be called whenever desired.

Chapter President R. B. Cherry returned from Colorado with a deer!

—Glen Dearing, Director, District 2

★

Pittsburgh Chapter:

We held our semi-annual Dinner Dance at the "Anchorage," a high class night club on the Alleghany River Boulevard, on November 25th. It was the best affair of its kind yet held. Entertainment was from local broadcast stations.

Our recent meetings have been business meetings with no outstanding programs. However, we have a series of lectures planned starting with the December 12th meeting that are real good. "Mathematics in Radio" will be the first, a Carnegie Tech professor to be the speaker; "Physics in Radio" the second, by a Bureau of Mines professor; "Electronics in Radio" the third, by a Pitt professor;

and "Business Administration" by a Duquesne University professor. These will be half-hour lectures put across in practical style at the beginning of each meeting.

Repair and service work are at a high here, and competent servicemen are impossible to secure.

—Richard G. Devaney, Publicity

★

Saginaw Chapter:

Our Chapter met at the Home Radio Service Shop October 8th. We had all but three members present and had five non-members as guests who expressed willingness to sign up. Our speaker was Alfred O. Seitz, of the Police Radio Department of Saginaw. He conducted a question and answer forum which was enjoyed by all.

Most of the servicemen present at the meeting seemed satisfied with the new schedule of prices as outlined by the Philco service plan. And most of them were going to put them in effect as soon as possible.

We were all very much surprised at the lack of attention paid to the recent article in *Reader's Digest* by the customers in our section. Most of the customers who did remark about it treated it as a joke. Members could only recall about a dozen people in all that insisted on having the set serviced in the home.

—Dale H. Hoag, Secretary

★

MORE RADIO QUIZES

Quiz programs are enjoying a great deal of popularity at the Lehigh Valley Chapter meetings, says Ray Abbott, Secretary. Ray says it's surprising the fellowship promoted by this means. Fellows who had never really gotten together before will argue at length over some disputed technical point, the questions on the Quiz Program being made broad enough in some instances to provide a

difference of opinion.

Here are some that were tried out on the boys at the November 3rd meeting. See how good you are. Answers will be found on page 18.

1. Where would the following tubes be used? 3Q5GT, 6A8, 6Q7, 1H5GT.

2. Moisture is sometimes found in a radio chassis because of the grid leak. True or false?

3. Within 20 kc., what is the most commonly used i.f. in standard receivers?

4. What is the most commonly-used i.f. in f-m receivers?

5. A voltage-doubling circuit depends on condenser action for its voltage doubling. True or false?

6. A Class B amplifier is one which is 2nd class. True or false?

7. Early superheterodynes were sometimes known as supersonic radios. True or false?

8. In order to obtain all of the benefits to be had from f.m. a limiter tube must be used in the receiver. True or false?

9. What is the proper plate load resistance for a 6F6 tube?

10. A decibel is 1/100 of a bel. True or false?

11. In a superhet using 460 kc. i.f. and a 760-kc. signal present, where, with a signal tracer, would a signal of 1220 kc. be found?

12. Why were loops used on most early superheterodynes?

13. Within 20 ohms what would be the resistance of a line cord for a set using two 25-volt tubes and three 6.3-volt tubes, at 300 ma.?

14. Frequency-modulated signals can be received on an ordinary super-regenerative receiver. True or false?

15. What is the average power factor of a straight a-c set?

Well, how did you make out? More questions next month—and if you have any stumpers, send them in.

RCA OUTLINES DEFENSE TUBE PRODUCTION SITUATION

A DISCUSSION of the important part which the radio tube industry will be called upon to play in the National Defense program, and of problems facing all radio tube manufacturers with growing shortages of vital materials, was the subject of an informal luncheon meeting at the RCA Manufacturing Company's tube plant in Harrison, N. J.

L. W. Teegarden, Manager of RCA's Radio and Tube Divisions, told New York radio trade press editors and representatives that RCA was already supplying a large volume of receiving, transmitting and special purpose tubes to the U. S. armed forces, to Lease-Lend, and to defense equipment manufacturers, while striving to meet requirements for commercial uses.

RCA's tube activities are expanding in all departments to conform with enormous government requirements, said Mr. Teegarden. He quoted from the Company's

published statement that "under the unlimited emergency declared by the President, we see only one course of action—National Defense comes first. By comparison, we hold nothing else important."

It was pointed out that demand for many tubes has increased many-fold and that backlogs of orders are running at record-breaking levels despite tremendously increased production. For example, RCA has increased its output of glass receiving tubes by 17.7% over 1940, and its output of metal receiving tubes by 18.1%. In addition, inventory reserves of completed tubes have been depleted by 24.4%, as compared with last year.

Industry's New Problems

Mr. Teegarden pointed out that the tube industry's problems will be more serious not only because of limitations imposed by materials shortages, but even more so

by the industry's lack of adequate production facilities and trained personnel. To date, he added, all of the government's defense requirements for receiving tubes have been met promptly by RCA. These requirements have represented only 6% of the Company's total production. At the current production rate, 12% to 15% of total receiving tube production is devoted to defense requirements, and in Mr. Teegarden's opinion, this percentage will inevitably increase.

Power and special purpose tubes, however, present a totally different picture, he said. Tremendous demands for these tubes, on which the industry has had little or no experience, are being imposed on the industry by the defense program. RCA has responded by greatly increasing production during the past year. The Company is building 357% more power tubes, 147% more cathode-ray tubes and

(Continued on page 21)



MR. A. C. BURNS
Tenth North Radio
& Elec.
2355 — 10th Ave.
North
Seattle, Washington

I have been selling N. U. tubes for over 40 years and find them most satisfactory. N. U. has been more than helpful in cooperating with the dealer with their equipment, sales promotion and advertising programs. I heartily recommend N. U. to any dealer or serviceman.

**WHERE YOU FIND
NATIONAL UNION
YOU FIND BETTER
RADIO SERVICE**

**PREMIUM
Quality
TUBES**



BATTERIES



CONDENSERS

also Sound X/tra tubes, panel lamps, cathode ray tubes, exciter lamps, sound equipment, photo electric cells, sound accessories, dry batteries, flash light bulbs.

NATIONAL UNION invites . . .

All radio service dealers to enjoy the benefits of the N. U. Shop Equipment Plan. The latest in tube testers and test equipment are available to you . . . prompt delivery. More than 60,000 completed deals prove the success of this plan. Investigate now.

Ask Your N. U.
Distributor or Write



**NATIONAL UNION
RADIO Corp.**
57 STATE ST., NEWARK, N. J.

ANSWERS TO RADIO QUIZ

(As supplied by Lehigh Valley Chapter, RSA. We assume no responsibility and refuse to enter the argument on any question!)

1. Audio, translator, demodulator and 1st audio, ditto.
2. False.
3. 465 kc.
4. 4.3 mc.
5. True.
6. False.
7. True.
8. True.
9. 7000 ohms.
10. False. 1/10 is correct.
11. Translator plate.
12. To prevent radiation from set's oscillator.
13. 160 ohms.
14. True.
15. 85-90.

★

RCA RADIOLA R-566P

(Continued from page 10)

heater. The dial lamp, shunted by the 15-ohm ballast resistor *R11* is in series with the heater string. The lamp and ballast resistor combined serve to protect the tube heaters from over-voltage—the resistor alone in the event that the lamp burns out.

The main advantage of the voltage-doubling power supply is, of course, the higher supply voltage made available to all of the tubes—particularly the 35L6GT.

Both i-f transformers are permeability-tuned. An initial bias of 2 volts on the grid of the i-f tube is provided by the unbypassed cathode resistor *R6*. This has a value of only 33 ohms—too low to require bypassing, as the degree of degeneration involved is negligible.

Degeneration is applied to the output tube, as may be seen from the schematic.

The front section of *S1* is the On-Off switch. The rear section of the same switch is the Phono-Radio selector and tone control. A "Mellow" position, applied by grounding *C25*, provides reduced highs in either the Phono or Radio position.

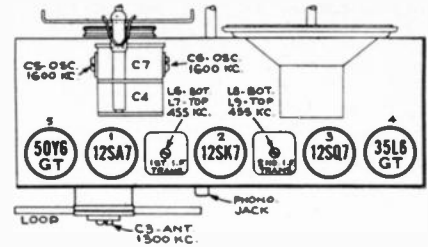


Fig. 2. Trimmer locations.

ALIGNMENT

Connect high side of test oscillator to i-f grid in series with .01 mfd. Tune test oscillator to 455 kc, turn receiver dial to quiet point at 1600-kc end, and adjust *L8* and *L9* on 2nd i-f transformer for maximum. Trimmer locations are shown in Fig. 2.

With everything else remaining as is, connect high side of test oscillator to 1st detector grid and adjust *L6* and *L7* for maximum.

Then connect high side of test oscillator to antenna terminal in series with 200 mmfd, tune oscillator to 1600 kc, gang condenser at minimum, and adjust *C5* and *C6* for maximum.

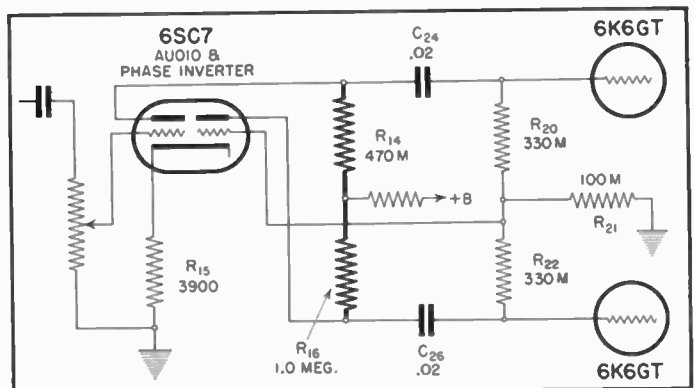
Feed a 1300-kc radiated signal from test oscillator to loop, tune receiver dial to signal frequency and adjust *C3* for maximum.

Wind up by repeating the last two steps.

CIRCUIT COURT

(Continued from page 9)

Circuits of this nature usually do not provide a balance better than 10 percent, because of the reduced gain of the inverter section. In the accompanying circuit, a closer balance is obtained by using dissimilar values of plate resistors. Thus, it will be seen that the input or driver section of the 6SC7 has a plate resistor (*R14*) of 470,000 ohms, while the inverter section has a plate resistor (*R16*) of 1 megohm. The respective gains, after degeneration, are therefore more equal than would otherwise be the case.



Balanced phase-inverter circuit employed in the new G.E. Model LC-758 receiver. Note values of plate resistors.

WAR-TIME SERVICING

(Continued from page 5)

of bias resistor may have to be used, possibly plate-supply voltage will have to be reduced in some cases; but the tube can be made to operate satisfactorily. This is also true in the instance of power tubes, although an attempt should be made to match the recommended load resistance by changing the out-put transformer, re-matching by a change in connections if taps are provided for various impedances, or by the application of inverse feedback.

As we said before, we trust that the situation will not become so critical that such makeshifts will be found necessary. But if such makeshifts must be resorted to in the future, you will still be able to keep the nation's receivers operating—and that's the main thing.

SERVICEMAN'S DIARY

(Continued from page 7)

reimburse you for that." And she went out of the room to get her pocket-book.

"Am I dreaming?" I whispered to Jerry, but she returned before he could answer. When she insisted on paying for our call as well, it was a circus to see Jerry pretending he didn't want to take it. But he did, without *too* much resistance.

On our way out Mrs. Markham said, "This will teach me to be a bit more trusting in the future, and it's nice to know you young men are reliable. Well, good day," she added, "and do have a joyous Christmas."

"Thank you, Mrs. Markham," we chirped, "and to you and your son, too."

On the way down the drive, Jerry said, "Nice old dame, isn't she? Wouldn't have thought she had it in her. Must be something to this Christmas idea after all, if it'll thaw out a Markham."

"Things are like that," I said. "People get together and name a time of year as a period of truce. No sharp-shooting, no sniping, nothing but good will all around. Which reminds me," I added, "what would you like for Christmas. You know, we always . . ."

"Oh, nothing this year, pal," Jerry said. "Save your money for Defense Stamps and we'll just exchange greetings—and maybe a little nip, eh?"

"Sounds good to me," I said. "I mean that part about our buying Defense Stamps—but I'd like to give you something, and what I had in mind was fixing up the frequency response of the set you have in the living room."

"What do you mean fixing it up!" Jerry shouted. "That job's flat from 30 to 10,000 . . ."

"That's the trouble," I said. "It's flat. What you need is some belly oomph, and I thought if you'd let me put in a bit of bass boost, the little woman would . . ."

"Never mind the false bass," he broke in. "When I want bass I'll ask for it, and it won't be Santa Claus I'll ask."

"Okay!" I said, a bit hot under the collar myself. "Be Mr. Superear."

"Now, now," Jerry cautioned, "let's not go through all of *that* again. After

all, I know you meant well, though it is a pity you can't hear anything above 5000. But let it all pass—for this is Yuletide and we must let Mrs. Markham set us a good example. Besides, we have her dough, haven't we?"

"Change that 'we' to 'you' and you're correct," I said.

"Oh, come now," Jerry said. "What is mine is yours, and what is yours—I hope—is mine."

"Is that a fact?" I said. "Well, let's have a little nip, then, and from now on be men of good will."

"That we will—that we will," cried Jerry. "As soon as we get back to the



In Defense of Your Business!

So that the nation may continue to be informed—more than thirty-five million receivers in American homes and automobiles must be kept in first-class condition.

This is a responsibility of the trade—your responsibility and your contribution to the defense of the nation.

The replacement requirements which in the months to come will be more and more important to your business call for careful selection of parts in order to conserve resources and materials so important to defense and civilian needs. The requirements of Utah customers will be met as promptly and as completely as possible.

Many Utah products are being used in National Defense—for Army, Navy, Air Corps and important civilian communications. Utah engineers are continually at work, meeting the demands of the National Defense Program and its necessary restrictions on some materials. All the experience, knowledge and skill of the Utah production staff are required to comply with the ever-increasing demand for Utah Speakers, Transformers, Vibrators and Utah-Carter Parts.

Utah Radio Products Company, 836 Orleans Street, Chicago, Illinois. Canadian Office: 560 King Street, West, Toronto. In Argentina: Ucoa Radio Products Co., SRL Buenos Aires. Cable Address: Utaradio, Chicago.





FOR TRIPLETT CUSTOMERS ONLY

Long before the state of emergency was proclaimed, the Triplett Company was getting ready to do its part in building our national security. We knew that we must meet important new responsibilities. At the same time, we felt keenly our continuing obligations to our customers—old friends with whom we have had happy business relations through many years.

We doubled—then tripled—our output to fill the needs of our old accounts. We added to our production facilities . . . hired many more men . . . are working extra shifts at time-and-a-half.

All this has not been enough. We have been called on to produce more and more for national defense. We are proud of the job we are doing to help meet the emergency, but it is difficult not to be able to serve our old friends equally as well. In the face of these conditions, the Triplett Company has adopted these policies "for the duration."

First: We will continue to serve you by our service to our mutual responsibility—the national emergency.

Second: We will continue to do everything we can to fill orders from our regular customers, even though some deliveries may be temporarily delayed. No business from new accounts has been nor will be accepted until after our old friends have been served, except where priorities make it impossible to do so.

Third: Our engineering and research departments will continue to work on the development of superior equipment and improved methods to serve you still better when we can resume normal operations.

The present emergency is incidental and as we work towards the future, we will do our best to continue to merit your confidence and loyalty.

R. L. Triplett

President
The Triplett Electrical Instrument Company
Manufacturers of Precision Electrical Instruments

shop." With that he stepped on the gas and we went zooming across the countryside.

"There is," I said, "no time like the present. Why wait until we get to the shop?"

"Well, splendid!" Jerry exclaimed, slowing down. "Didn't know you had a drop on you."

"Nor have I," I said. "But we could try that pint of rye Mrs. Markham slipped you."

"The —" Jerry began. "Oh, very well," he sighed. "I was keeping that as a surprise—for Christmas."

"It wouldn't surprise me at all," I said, reaching into his pocket. "But it happens to be a surprise I want to be in on."

Jerry shook his head gloomily. "Maybe the Reader's Digest was right. You'd swipe the . . ."

"So they were—so they were," I broke in. "Men of good will—bah!"

THE RADIOFRONT

(Continued from page 11)

ness lessons. Try it yourself. Remember the last time you took your car to the "official company repair shop." What happened?

One. A man asked you what was the matter.

Two. He looked your car over.

Three. He took down your name, address, make of car, mileage, and wrote down the probable source of trouble.

Four. He told you what it would cost to repair your car, and—

Five. He told you when it would be ready.

Believe it or not, you didn't haggle with him, and when you had made up your mind that he should make the repairs, you were ready to pay the sum asked on the delivery date.

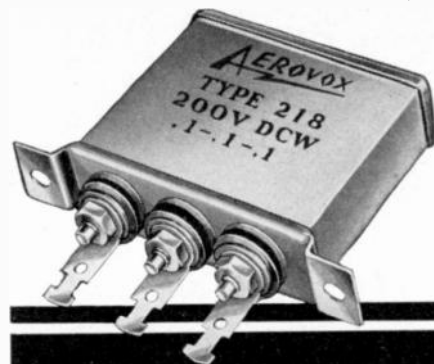
Why not run your business the same way? Now is the time when you can impress your customers that you are as reliable as the other man. That means that you have to know at least two things:

One. What the repair will cost, and—

Two. When the set will be ready for delivery.

To know those two things you have to know your business! That does not mean that you will figure out that you can't get the set ready in time by using a grade A part to replace the burned out one, and so will use a grade B one. That means that you will tell your customer that there will be a delay in getting the correctly designed part for his set (if that be the fact)!

In a town in the mountains of Pennsylvania, servicemen are having trouble getting parts, and their customers are willingly waiting from *three weeks*



Use these for
**COMPACT
ASSEMBLIES!**

For that top-flight work coming your way, especially if you are after your share of electronic gadgeteering, Aerovox offers you its extra-heavy-duty capacitors heretofore made to order for government, commercial-communication companies and other critical buyers.

Type 218 oil-filled metal-case capacitor is typical of this greater choice. Similar to Type -16, but with terminals at bottom instead of top. This and other extra-heavy-duty capacitors not listed in our general catalog, are nevertheless now available through your jobber.

Ask Your Jobber...

He'll gladly go over the Aerovox Transmitting Capacitor Catalog he has on file, with you. He'll order what you need. In every way possible, he'll help you cultivate the most profitable servicing trade.



NEW CATALOG

OF SOUND AMPLIFYING SYSTEMS
AUDIOGRAPH Sound Systems represent the latest in Public Address equipment—a complete line plus pre-tested accessories.

NEW LOWER PRICES

Outstanding quality and performance at prices that help you meet any competition.

WRITE FOR YOUR FREE COPY

AUDIOGRAPH
THE FIRST NAME IN SOUND

John Meek Industries—1313 W. Randolph Street, Chicago, U. S. A.

to a month for a repair job! And paying good money for the work, too!

So don't let the situation jog you out of your good business sense. Keep your eyes open, assist your distributor in getting parts to you by filling out the OPM forms he requests of you. (He has at least three times as many as you.) And above all, utilize this great opportunity to "put your business on the map"!

ODDS 'N ENDS

Prices may be frozen at the July 15, 1940 levels, is the rumor . . .

The Navy is looking for servicemen. If you can meet the requirements, which are stringent, and you want to get into the Navy, this is your chance . . .

A determined effort, which may get results, is being made to keep the small fellow in business in spite of the priority system . . .

Watch for a blow-up in the Senate investigation of defense contracts. There are too many brokers in the deals. When we suggested that such a condition existed, over a year ago, we were told we were crazy. Yeh, crazy like a fox . . .

A well-known firm is already getting itself buckled up to buy up all the unused Army radio material it can after the war, and will flood the market with receivers (communications) and ham transmitters . . .

Join your local Civilian Defense Unit. Not only is that good business, but you owe that much to Uncle Sam . . .

Department stores are trying to get into your line of business. They see the hand-writing on the wall. Don't let it happen. You can stop them by maintaining your prices and your service. Let it be tops. No customer changes servicemen unless forced to. We are all creatures of habit. Let them get the habit of coming to you . . .

Don't be a defeatist. Regardless of how the war comes out, you can't win it with talk . . .

But you can talk yourself out of winning it!

TUBE PRODUCTION

(Continued from page 17)

256% more special purpose tubes than a year ago. In these categories shipments during October were 71% for defense purposes, with every indication that the percentage required for this purpose will increase substantially in the near future. Based on present available estimates, demand in 1942 will be five to six times the value of RCA's 1941 shipments, which are already 2½ times the 1940 total.

Shortages May Come

Enormous problems remain to be sur-

"Miking" a Mandrel!
TO A 0.00025 OF AN INCH.

This is just one of the many, unusual voice-coil accuracy controls which makes the CINAUDAGRAPH Speaker a superb unit for the reproduction of sound. That is why you should prefer it to any other loud-speaker!

Send for free Catalog No. 42-1.
CINAUDAGRAPH SPEAKERS, Inc.
921 W. Van Buren Street
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CINAUDAGRAPH SPEAKERS

Replace with the Best!

ALLIANCE "EVEN-SPEED" PHONO-MOTORS

EASY TO INSTALL . . .
Fit 95% of all makes

INDIVIDUALLY PACKAGED

● The low cost and quick, easy installation of "Even-Speed" Motors make it more practical and profitable to replace the entire unit when trouble occurs. The "Even-Speed" line of only four phono-motors provides a unit for 95% of all replacement requirements. Carry a few in stock. Each motor and turntable comes in an attractive carton for your greater convenience.

Ask your jobber or write direct for complete information and low prices.

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THANK YOU

for your approval of RIDER BOOKS

as evidenced by your unprecedented demand for established Rider publications and the many new books released during the past twelve months. For the coming year we are planning important new additions to our list. We promise you every effort to produce Rider Books.

and

RIDER MANUALS

that will make your work easier, faster and more profitable in 1942.

JOHN F. RIDER PUBLISHER, Inc.
404 FOURTH AVENUE, NEW YORK CITY
Export Div.; Radio Int. Elec. Corp., 100 Varick St., N.Y.C., Cable: ARLAB

New, Handy



UNIVERSAL REPLACEMENT



Write for Catalog

**SOLAR MFG. CORP.,
Bayonne, N. J.**

mounted in the future. Mr. Teegarden indicated, adding that no one in the industry is in a position to predict accurately the available supplies of any types in the coming months. He said that slackening of commercial demand for receiving tubes is probable in the future in view of indications of further government curtailment of radio receiving set output.

As far as power, cathode-ray and special purpose tubes are concerned, he said that many vital civilian services now have difficulty in obtaining the tubes they require to remain in service. He indicated that the entire industry will have to expand greatly if they are to fill indicated requirements for national defense.

RCA Invites Sub-Contracting

To this end, the RCA Manufacturing Company has indicated its willingness to extend to other manufacturers of tubes technical assistance in making special tube types developed by RCA. These special types of tubes have been developed at a cost of many thousands of dollars, and such information is normally regarded as a commercial secret. The offer was made by means of the following letter, dated November 3, 1941, and addressed to the other manufacturing organizations by Mr. Teegarden:

"The rapid increase in our requirements to meet the needs of the National Defense Program necessitates the manufacture and delivery of tubes at rates which are considerably greater than any production which has been obtained up to this time.

"In view of this situation, therefore, we desire to consider subcontracting for certain quantities of these tubes and to place other members of the tube industry in a position to serve equipment manufacturers having defense contracts.

"We have set up at our Camden, N. J. plant a department with responsibility for administering sub-contract work for our entire Company. This department is under the supervision of Mr. H. L. Sommerer, Manager.

"If you are in a position to participate in the overall Defense Program by undertaking any portion of this production on a sub-contract basis or otherwise, we invite you to write to Mr. Sommerer indicating the facilities and capacity you have for this type of work, after which we will arrange for a detailed discussion as promptly as possible, with a view to sub-contracting on those types in which you are interested", the letter concludes.

Also participating in the meeting, in addition to the New York radio trade press, were the following RCA executives: J. A. King, RCA Harrison plant manager; Dr. G. R. Shaw and A. S. Kelley, of the RCA Harrison Works; D. J. Finn, Advertising Manager; D. Y. Smith and L. S. Thees, of the Sales department; and J. P. Allen, in charge of tube and equipment advertising, Julius Haber and Howard Gilbert, in charge of publicity, all of the Camden office of the Company.

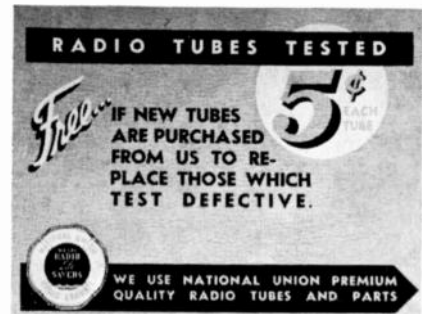


**Remember Pearl Harbor—Buy
U. S. Defense Bonds**

NEW LITERATURE

Display Cards—Much has been written recently about the Radio Service Profession in general and in particular of the practices prevalent among some servicemen.

Regardless of whether or not the charges are legitimate, the public has had most of the weaknesses brought very forcibly to its attention.



In an effort to aid the servicemen to constructively counteract any ill effects, National Union has had a series of four cards prepared as follows:

1. A reprint of the *Reader's Digest* article. The purpose of this card is to build up in the mind of the prospective customer the fact that the serviceman realizes some of the troubles obtaining in the industry and that knowing them strives to overcome these malpractices. It points out to the customer what could be done but leaves the customer with the idea that this shop is pledged to truth in Radio Service.



2. An individually embossed sign attesting to the fact that the shop was inspected by a National Union representative and found to contain all essential testing equipment.

3. & 4. Reserve the right to charge for testing all tubes where replacements for the defective items are not purchased and a nominal service charge for all inspecting of sets.

The cards are specifically designed to take advantage of public aversion to unscrupulous servicemen and public desire to patronize honest and expert radioticians.



Unibelt Chart—The Walter L. Schott Co. of 5266 West Pico Blvd., Los Angeles, Calif., has just issued a new "Walsco Unibelt Reference Chart" which is available to distributors, dealers and servicemen. Most popular sets using dial belts are listed in this chart, which gives the

required number Unibelt for every set and also specifies the length to which the belt should be cut in each particular case.

The Chart shows that 98 out of 100 replacements can be made with 3 Unibelts.

Free copies are obtainable from Walsco distributors or by writing the manufacturer.

★

Merchandising Tags—Attractively printed tags to help radio technicians merchandise their service and reliability to the customer are now included in the cartons with all IRC Volume Controls for replacement use.

Entitled "Your Serviceman Knows Quality", the tags are signed by the International Resistance Company and are designed to impress customers with the fact that the new controls installed in their radios are of the same design and construction as IRC controls used in marine and aviation radio, as well as in other exacting communications uses.



The back of each tag invites the customer to recommend the serviceman to their friends. It contains space where the serviceman's name, address and telephone number may be written in or rubber-stamped.

Strings attached to the tags, enable them to be fastened to control knobs so that customers cannot fail but see them when the jobs are delivered. One tag is included with each IRC replacement control and servicemen who have already seen them are loud in their praise for the idea. They regard it as an important move by a well-known manufacturer to help them build the type of consumer confidence that is so essential to their own business success.

★

APPOINTMENTS

Almy and Oliver—Promotion within the radio tube division of the Hygrade Sylvania Corporation of *R. P. Almy* to the post of Assistant Renewal Tube Sales Manager and *A. R. Oliver* to Field Sales Supervisor was recently announced by *C. W. Shaw*, General Manager of radio tube sales. Mr. Almy and Mr. Oliver are carrying on the work formerly handled by *P. S. Ellison* who vacated his post of sales and Advertising manager of the renewal tube division to become director of advertising for the entire company.

Mr. Almy has had a long stewardship with the company. He has risen in the sales department to western division manager, eastern division manager and re-



R. P. Almy (left) and A. R. Oliver, promoted by Hygrade Sylvania.

cently to sales supervisor, the post he held under Mr. Ellison until this announcement of his new position. He will be located at Sylvania factory headquarters in Emporium, Penna.

Mr. Oliver has been with the company for over four years as western division manager, located in Chicago. In that capacity he travelled the midwest and west and has become well known to radio jobbers in that area as well as in sections extending beyond his territory limits. Previous to his association with Sylvania, Mr. Oliver travelled the east coast for other radio parts manufacturers and thus comes to his new position with broad national sales experience. He will continue to maintain his office in Chicago, Illinois, at 135 South LaSalle Street.

★

Ellison Elected to A.N.A.—*Paul S. Ellison* was elected to membership on the Board of Directors, Association of National Advertisers, at the Annual Fall Meeting held in Hot Springs, Virginia, recently.

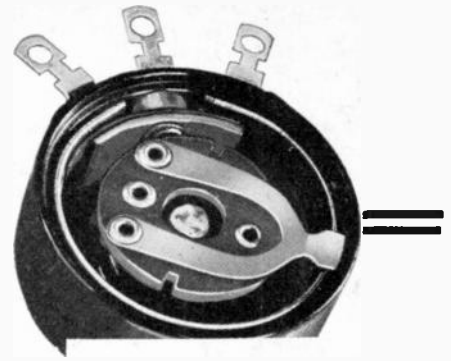
He has been constantly active in the A.N.A. ever since he became advertising manager of the Brunswick-Balke Colendar Company in 1926.

DEFENSE FRONT

THE PRIORITIES SYSTEM

THE status of the entire radio industry—from manufacturers through jobbers right down to service-dealers—would be greatly improved if radio parts jobbers had a more thorough understanding of the Priorities System, and if they put this knowledge into practice.

The RMA, NRPDA and Priorities Committee of the Radio Parts and Associated Industries have repeatedly tried to impress upon parts jobbers that a vast amount of their over-the-counter business is entitled to some preferred priority recognition. But many jobbers, because of apathy to or unfamiliarity with the Priorities System, still neglect and do not protect their own and their suppliers' best interests by ascertaining the use to which any part or piece of equipment being sold will be put.



WIRE-WOUND CONTROLS

★ Here's what you see when you look inside a Clarostat wire-wound control: Precision winding on bakelite strip; perfected sliding contact of special alloy; exclusive winding lubricant for smooth rotation. ★ Linear controls are rated at 3 watts; tapered, 1.5 and 2 watts. 1 to 100,000 ohms. Ad-a-Switch feature. ★ Clarostat Wire-Wound controls are in constant use on equipment designed and built for use in many electronic devices **NEEDED FOR NATIONAL DEFENSE.** ★ Order from your local Clarostat jobber. Ask for latest catalog—or write us direct.

CLAROSTAT MFG. CO., Inc.

285-7 N. 6th Street, Brooklyn, N. Y.



Save money on RADOLEK Sound Systems



Come to Radolek—**Public Address Headquarters**—where you get more for your money in Performance, Styling, Dependability and Reserve Power. Radolek Deluxe PA Sound Systems, in 15, 30, 50 and 100 watt sizes, incorporate every desirable feature—multiple input channels, built-in input and mixer controls, AVC, "feedback" tone control circuit; output impedance selection, electronic mixing system—all engineered for plus performance. Models for permanent, portable or mobile use. Wide choice of microphones, speakers and related apparatus. Send the coupon for complete information.

FREE!



RADOLEK'S RADIO SERVICE GUIDE

Lists every replacement part to repair any radio—every type of tube—everything for auto radio installation, transfer and repair—test equipment, sound apparatus, etc.—all at lowest prices. Send your copy today!

SEND TODAY! PASTE ON A POST CARD

RADOLEK CO., Dept. SD-61
601 W. Randolph St., Chicago, Ill.
Please send information on Radolek Public Address Equipment—also the Big Radio Service Guide.

Name _____
Address _____
 DEALER SERVICEMAN SOUND ENG.

For example, according to regulations promulgated by the Office of Production Management, Division of Priorities, any radio serviceman who has in the past and who expects in the future to test tubes or parts which are employed in electronic equipment used by a plant engaged in defense work, a public utility, laboratory or college, may go to his jobber and purchase said test equipment on an A-10 or better priority basis. When the jobber writes out the order, (whether or not he has the instrument in stock makes no difference), he can stamp it, "Material for Repair, Maintenance, or Operating Supplies Rating A-10 under Preference Rating Order P-22, as amended, with the terms of which I am familiar." The jobber should then have his customer sign the purchase order, whereupon he, the jobber, can send his order to the test equipment manufacturer and again use the rubber stamp referred to above. This procedure will enable the instrument manufacturer to obtain necessary materials and components used for the assembling of the instrument under preference rating No. P22 and on an A-10 basis. Here is an example as to how jobbers can get much better than A-10 ratings for some of their orders if they take the time to ascertain from their customer what the ultimate destination of the part in question is to be. Supposing a customer asks a jobber for a transformer that is to be installed as a replacement in some device in a steel mill, the jobber can, according to OPM's release "PM1479," sell the transformer and assign this particular purchase

a preference rating of A-3. On the other hand, if the jobber learns that some part of the steel mill's production line has to suspend operations, until this particular replacement transformer can be bought and installed the customer could assign an A-1-a rating to this particular purchase.

Jobbers must wake up to the fact that manufacturers soon will be delivering little, if any, merchandise unless it enjoys a substantially high preference rating. In every important community, OPM has established a Division of Priorities Field Service which offers to business men a complete staff desirous of helping them solve their problems with regard to the application of the Priorities System. Jobbers who fail to take advantage of this Field Service can blame no one but themselves if their lack of knowledge of the Priorities System results in their failing to obtain any and all merchandise they may need to supply their customers.

On the other hand, the higher the percentage of priority orders a jobber can obtain the better off he'll be on all his purchasing commitments.

*

RADIO INDUSTRY ADVISORY COMMITTEE

SIDNEY J. WEINBERG, chief of the Bureau of Industry Advisory Committees of the OPM has announced the formation of a Radio Industry Advisory Committee. Members on the Committee are:

Benjamin Abrams, Emerson Radio & Phonograph Corp.

W. R. G. Baker, General Electric Co.
M. T. Balcom, Hygrade Sylvania Corp.
W. J. Barkley, Collins Radio Company.
A. Bloom, General Instrument Corp.
H. C. Bonfig, RCA Manufacturing Co.
Roy Burlew, Ken-Rad Tube & Lamp Corp.
H. W. Clough, Belden Manufacturing Co.
Allen DuMont, Allen B. DuMont Laboratories.
P. V. Galvin, Galvin Manufacturing Co.
Larry Gubb, Philco Radio & Television Corp.
K. D. Hamilton, Isolantite, Inc.
W. P. Hilliard, Bendix Radio Corporation.
H. J. Hoffman, Westinghouse Electric Co.
J. J. Kahn, Standard Transformer Corp.
L. L. Kelsey, Stewart-Warner Corporation.
R. H. Manson, Stromberg-Carlson Telephone Mfg. Co.
Jack M. Marks, Fada Radio & Electric Co.
Victor Mucher, Clarostat Manufacturing Co.
L. F. Muter, Muter Company.
Harold L. Olesen, Weston Electrical Instrument Corp.
W. F. Satterthwaite, General Dry Batteries, Inc.
Ernest Scaring, International Resistance Co.
S. N. Shure, Shure Brothers.
Ray Sparrow, P. R. Mallory & Co.
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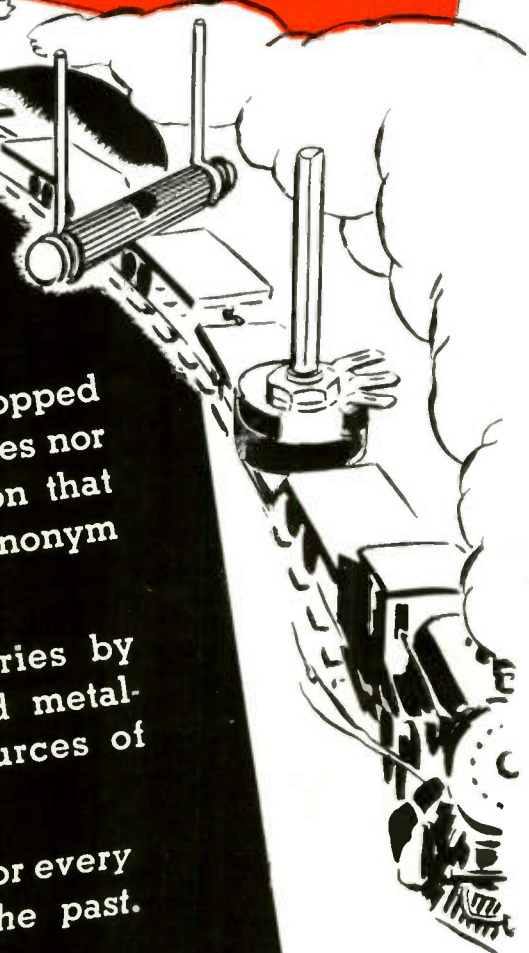
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