

THE

IRC

REG. U.S. PAT. OFF.

VOL. 1

The International Resistance Company's Monthly Bulletin Published in Furtherance of its Program of Helping Radio Service Men Do Better Work—and Make More Money Doing it

SERVICER

DECEMBER, 1933

NO. VI

Military leaders agree that the best defense is an attack. Defensive play never yet won a game, either in sport or in business.



"In other words," explains Service Sam, "winners are never content to follow competition. They make competition follow them."

SERVICE DOPE

Mention here of trouble on any particular make of equipment should not be construed as a reflection on the quality of those products. The best of radios will require attention from time to time. Thus, makes are mentioned only as a means of expediting prompt, efficient service on the wide variety of jobs confronting the average radio man. Readers are cordially invited to contribute their own service kinks to this department.

By SERVICE SAM

OUR article in November's "Servicer" about watching the little extraneous things in radio work, evidently met with hearty approval. A basketful of letters came in as a result and if you think we laid a little too much stress on watching for touching pipes, grounded lead-ins, defective light bulbs and the like—well, you should have read some of the accounts of trouble of this sort described by our readers. We'll probably find space for a number of them in a forthcoming issue. Meanwhile, remember the slogan: "Don't always blame the set." Maybe the radio itself isn't in the least to blame for that imitation of a skeleton dancing on a tin roof which so disturbs its "innards."

Cracked Carbon Resistors

Chas. R. Ziegler of Brooklyn warns against cracked carbon resistors in the following note regarding a Majestic 70 which showed no voltage on any but the 171 tubes.

"Resistors tested out," states Mr. Ziegler, "and so did the by-pass. Then, turning the set on to test all resistors in action, I found the 1,000 ohm brown carbon resistor—the third from the back of the power pack—open. When I tested it again with the set turned off, it seemed to be all right. Then I replaced it with an IRC 5 watt power wire wound resistor and the set functioned perfectly. Later, using a strong magnifying glass, I found that the old carbon resistor was slightly cracked. Since this time I've found several other cases of fading caused by the same trouble."

Making Coil Forms

Coil forms aren't required so frequently these days but Serviceman Milton Turen gives a hint concerning them which may prove useful on occasion. When the proper form has not been available, Mr. Turen



Serviceman's Wife: "Quick, Doctor! He seems to have a resonant vibration in the audible frequency band."

has solved the problem by heating a phonograph record over a Bunsen burner until it can be cut to the proper size. Then, while it is still pliable, he rolls it into shape.

A Motor Radio Problem

Donald Jenkins of Corning, Iowa, sends this dope for those who have been perplexed when trying to eliminate noise from a Victor M-34 automobile radio:

"A small piece of flexible wire (preferably a piece of shielding) soldered to the metal case and the small triangular piece of metal into which the shielding of the drive cable terminates has, in several cases, eliminated all pick-up noise after conventional methods have failed. It will be noted that this particular piece is insulated from the cabinet by three small rubber pads to take up the shock."

* * * * *

Here are a number of service tips from Chet Aydelotte of East Gary, Indiana. They go to form a pretty helpful little collection of "dope" and for that reason, we're sending Chet this month's free kit of IRC Resistors offered in connection with this column:

Sparton 931

"Spent a lot of time on this set on which the complaint was noise and intermittent reception. Removed pre-selector and fed a modulated signal into untuned

RF amplifier and everything seemed Okay. This put the matter right up to the pre-selector. I then tested each variable condenser with an 0-50 ohmmeter, and, aside from normal coil ohmage, could get no indication of a short. Finally, I called out the old reliable magnifying glass and found some extremely fine metal fuzz near the rotor shaft."

Sentinel 111's

Chet continues: "The 300,000 ohm detector plate resistor in these receivers will sometimes be found defective. A 1-watt IRC will end this trouble forever. Incidentally, this set is a TRF job having the following tubes: 1-35, 1-24, 1-47 and 1-80 and is, I believe, sold by a mail order house under another name."

Mantola 27

"On U. S. Radio & Television Model 27 marketed under the trade name Mantola," Chet adds, "I have found that the 8400 ohm section of the voltage divider sometimes causes trouble. An IRC 2-watt will supply a permanent cure."

Majestic 70—Sentinel 660

Mr. Aydelotte also tells how he cured a Majestic 70 which he inimitably describes as "deader than business was a year ago." The first filter condenser proved to be bad but when this was replaced the set still refused to function. He finally discovered (Continued on page eight)

MORE of those UNUSUAL SERVICE CALLS . . .

Resistors, Excessive Plate Current, Oil on Tube Sockets, Wrens, Waterbugs or What Have You?

THE moral of this incident," writes Serviceman Robert C. Barton, one of this month's kit winners, "is simply this: If you get reversal of polarity, look for a resistor that has gone away off value."

The trouble started when Bob was called out on a Fada 25 that showed reverse plate voltage all the way through. Resistors seemed Okay from a casual inspection. Then suspicion pointed to the filter condenser. Upon removal, first of the by-pass and next of the main filter section, the correct polarity was resumed. One by one, the condensers were put back. They checked perfectly as far as polarity and recharging spark were concerned until he had worked back to the main filter when lack of spark and reversal of polarity were again noted.

"Aha," thought Bob, "a new filter section will turn the trick."

Such, however, was not the case. The same condition prevailed after a new section had been installed and subsequent checks for grounds proved fruitless.

"Finally," writes Bob, "I started to check resistors against the schematic—and found that the white resistor rated at 3,000 ohms had dropped in value to about 300. This was quickly yanked out and replaced with an IRC unit of the proper rating and with the result that every one was happy, including myself."

TWELVE NEW TUBES A YEAR!

Semore T. Nathness of Menomonie, Wisconsin, cites an interesting case concerning one of the old Sparton receivers using the 250 tubes.

"This customer insisted," writes Mr. Nathness, "that, inasmuch as he had had to buy more than a dozen new 250 tubes in less than a year, something must be wrong. Naturally, I agreed.

"Several other servicemen had been called in, but to no avail. Finding all voltages normal, they had pronounced the



set Okay. However, by asking questions I got a clue from the owner himself which eventually led to a solution of the trouble. He explained that all of the tubes had once burned out at the same time and that the glass envelope on one of them had actually broken.

"Then it was that memory of reading Morecroft reminded me that an excessive plate current results in an increased heating of the filament, usually in one spot. At the instant the filament burns out, the plate current sometimes becomes great enough to cause a miniature 'explosion'.

"This happy thought prompted me to check the grid circuit of the 250's. Continuity tests showed everything to be all right, but closer examination disclosed that the biasing resistor was fastened in place with machine screws rather than with solder. One of the screws was found to be a little loose. A mere turn of a screw driver and tube burn-outs were a thing of the past for this customer."

YOU NEVER CAN TELL

Of course, it was easy—after the trouble was found. Mr. Nathness' experience, however, points out the desirability of careful and constant study in equipping the serviceman with a sound technical background.

The third and last kit winner of the month is E. B. Senter of Macon, Miss., whose experience is another one of those



illustrating the wide variety of unexpected trouble which may be encountered in service work.

Mr. Senter's customer had a Freed receiver using 26, 27 and 71-A tubes. He complained of poor reception at night and none at all during daylight hours. Routine tests supplied no clues and then Mr. Senter tried a phono pick up on the audio. This tested out and he next started to test with the oscillator, beginning with the aerial post and thence to the grids of the following tubes. When he came to the detector tube the signal broke through.

He writes: "Suspecting a high resistance leak somewhere I started testing with the ohmmeter and, sure enough, found that there was a leak in several stages. Closer examination showed an oily liquid on the tube sockets and when this was cleaned off carefully, the set worked perfectly. Upon questioning the owner, I found that the maid had wiped out the radio with a cloth well soaked in furniture polish!"

Mr. Senter adds: "We have been using

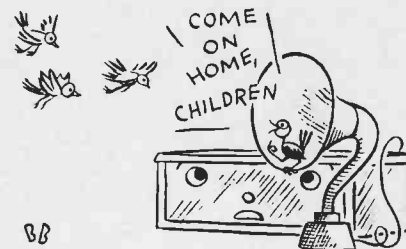
IRC Resistors for some time and think they are the 'berries'."

Thank you, Mr. Senter. We think so ourselves. Otherwise we wouldn't spend so much of our time writing about them.

THE MENAGERIE GROWS

This month's mail brought a number of additional letters describing calls wherein trouble has been caused, not by mechanical difficulties, but by what might be termed "animal interference." Although not prize winners, several of them at least warrant honorable mention.

One of the most unique cases is cited by Ezequiel Garcia, an IRC enthusiast of Baez, S. C. Cuba. M. Garcia was called upon by a friend who owned a 45 Radio Victor Electrola which operated perfectly on some occasions and not at all on others. In Baez electric current is available only at night, so, consequently, it was necessary to make tests after dark. However, the trouble was quickly found—in



the form of a frog which had entered through the back of the set and which was still alive when found.

Serviceman Carl A. Rogers matches this account with a story from rural Sycamore, Ohio. This summer he was called to repair a set owned by a farmer who had run the horn type loudspeaker out on the front porch so that his family could enjoy programs there on balmy summer evenings. Then came the busy harvest season and for several weeks the set was left unused. When the owner did try to use it, however, there was almost no volume at all.

Mr. Rogers checked the set itself and quickly determined that it was in good condition. Then he had a look at the loudspeaker on the porch. When he turned it over, out dropped a lot of straw. This was followed by a small bird nest and three live baby wrens!

"It wasn't a technical job," he writes, "but it does serve to show what a variety of things can happen to a radio."

WATER BUG "ARMY" ROUTED

And now to the rapidly growing menagerie, Cliff Longee of Roxbury, Mass., adds water bugs—a whole army of 'em. The set was an RCA-Victor R-17-M which had been in operation in the customer's kitchen until trouble developed and it stopped. Cliff picked up the set on his way home for lunch and connected it up in his own kitchen but without results. While they were eating, his mother noticed a water bug crawling out of the cabinet. It was quickly killed.

"But then," writes Cliff, "came the leader and the rest followed him. We counted up to twenty and then had to stop counting as they were coming out so fast we were afraid they'd get away.

(Concluded on page eight)



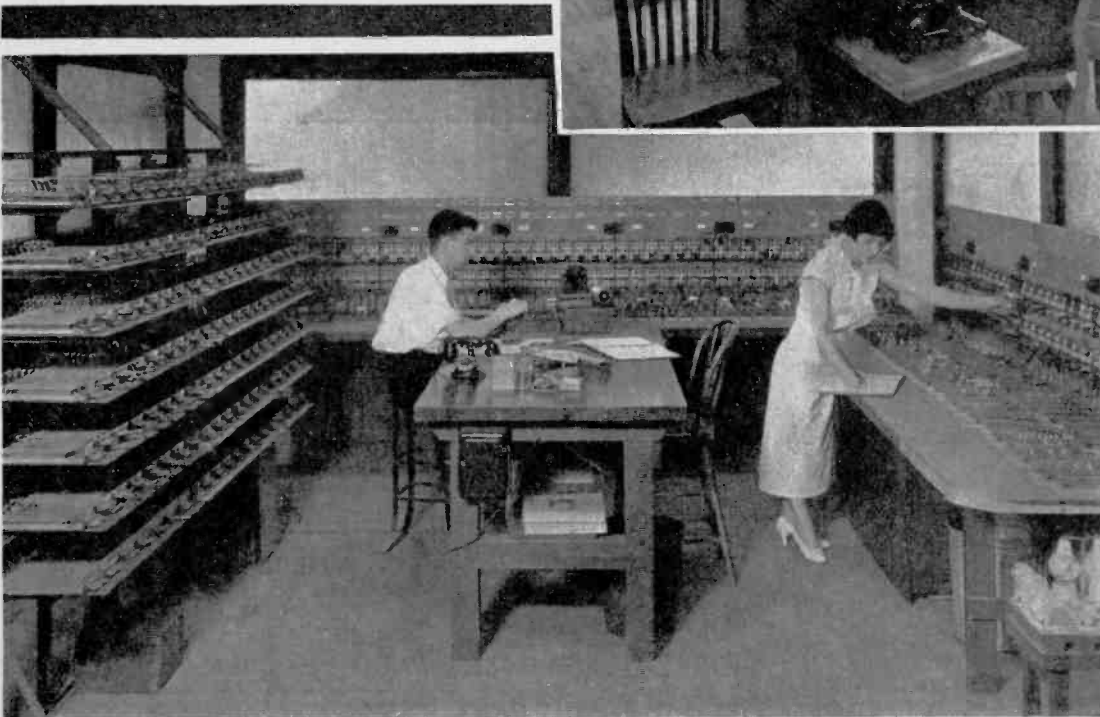
A visit to the Homes of **IRC** Resistors.....

Few individuals—even those who use IRC Resistors daily—realize the organization, research and equipment required for their manufacture. Thus the accompanying views of IRC units in the making will, we believe, prove distinctly interesting.

Here in the IRC general offices is handled the great amount of detail work necessary to insure to users of IRC Resistors the efficient and helpful service which they have learned to expect.



From the President down, the IRC executive staff keeps in close personal touch with all phases of the business.



← RESEARCH . . .

One of seven rooms in the extensive IRC laboratories where constant research is the order of the day. Here IRC units undergo a steady process of development which, since the beginning of radio, has kept them abreast of the demands of a rapidly changing industry. On the staff are engineers who are internationally known as specialists in their line.



Although one of the smallest—the most important—of the manufacture. As shown in Pa., research, modern combine to produce units

↑ MILES AND MILES . . .

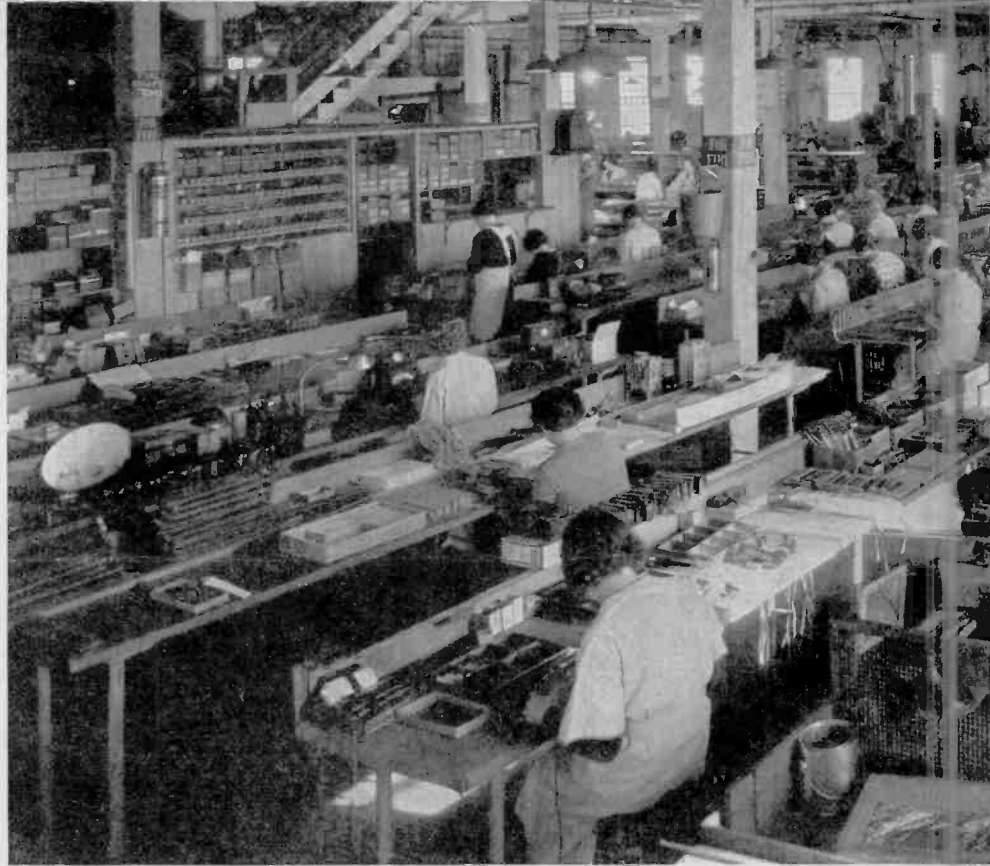
In the filament department is performed the most important step in the making of IRC Metallized Resistors. Produced with the utmost care, each lot of filament is carefully tested before going to the assembly department. Individual resistors are again tested before shipment. Filament manufacturing capacity is 7½ miles a day. Figure for yourself how many resistors this will make!



This well-known trademark appearing on all International Resistance Company products is your assurance of lasting satisfaction.

ASSEMBLY DEPARTMENT →

Automatic machines are supplemented by hand work which still plays an important part in insuring the precision and durability required of modern resistors. Each worker is highly skilled in his or her particular job and each undergoes extensive training before being permitted to do the work.



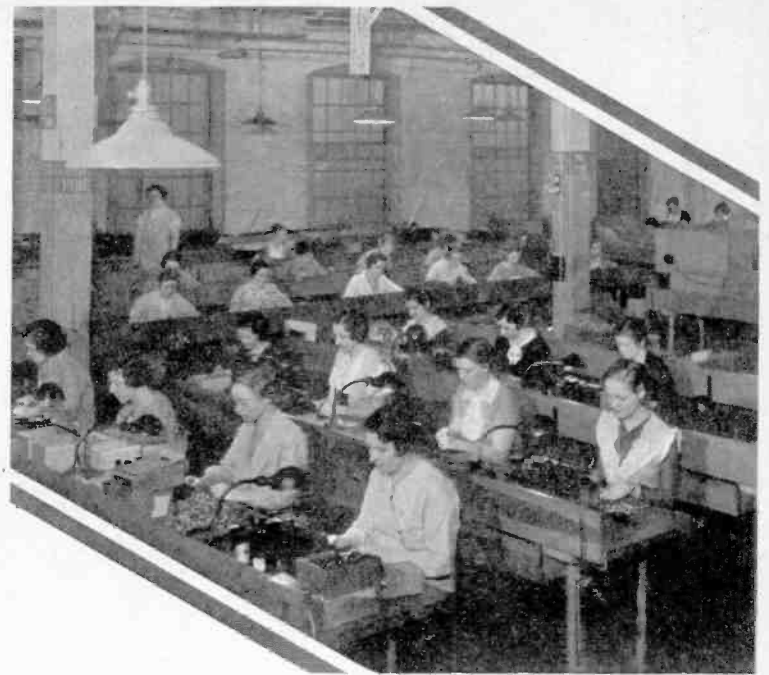
Besides the millions of resistors produced for leading radio manufacturers who recognize the necessity for sturdy units of high precision, a goodly percentage of IRC production is for service use in repairing and modernizing old sets throughout the world.

← WHERE TOOLS ARE MADE

So exacting are the requirements of IRC Resistor manufacture that the company maintains its own tool department. In it are designed and made practically all of the tools and intricate special machines used in the factory.



smallest parts in a modern radio, the resistor is one of the most important. Hence the necessity for extreme specialization in its manufacture. Witness these views of the IRC factory in Philadelphia, showing the latest equipment, patented processes and skilled workers producing resistors of unusually high efficiency and durability.

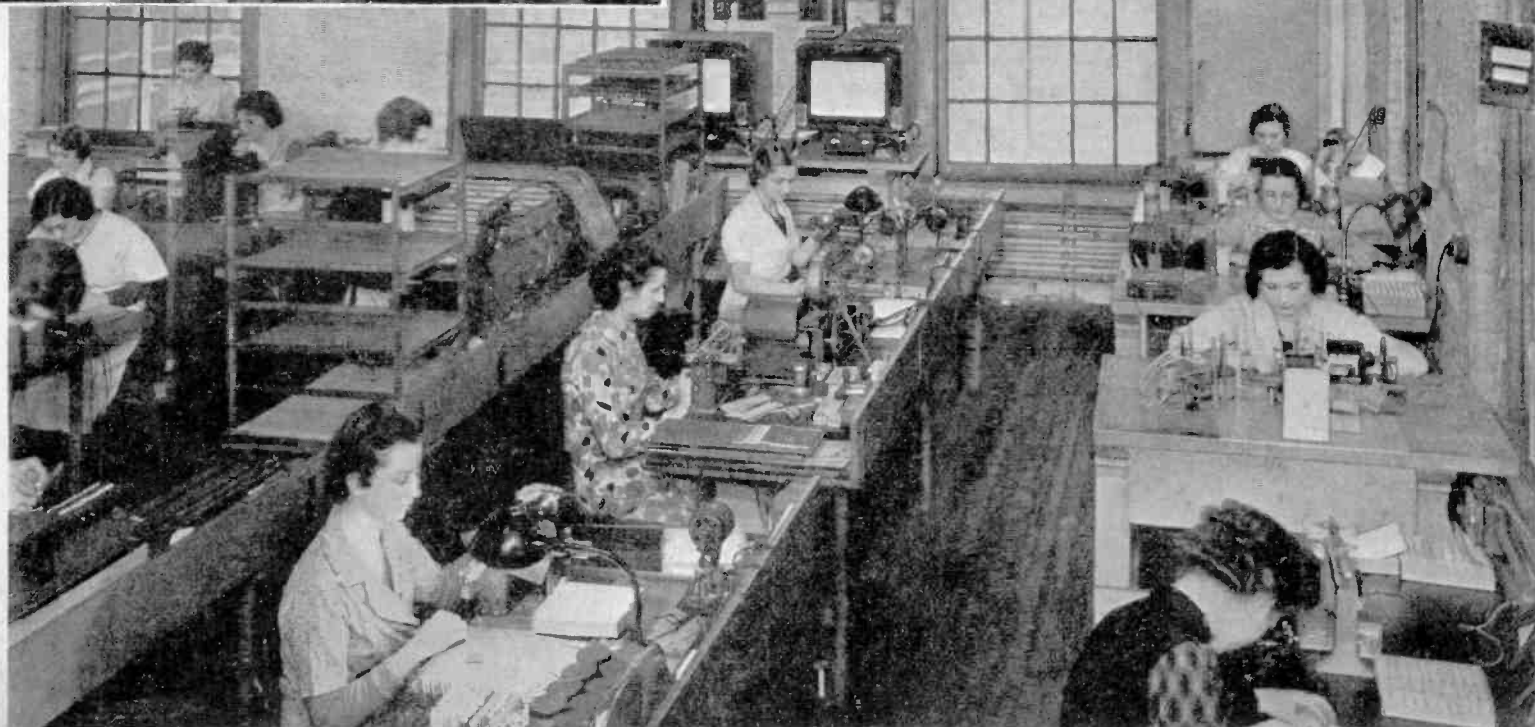


↑ **TEST—TEST—TEST!**

As the last step before shipping, every IRC Resistor is individually tested. If any fail to meet the exacting standards, they are immediately rejected and destroyed. No discarded resistors, no off-range units, no seconds leave the IRC factory.

WIRE WINDING

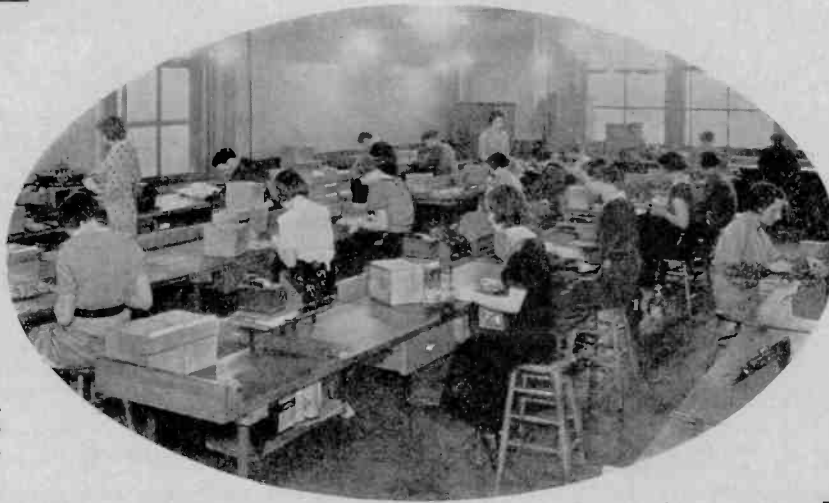
A corner of the wire winding department showing some of the machines on which IRC Precision and Power Wire Wound Resistors as well as resistance elements for the new Dual Resistor Indicator are wound. Skilled operators handle the machines and inspect every unit at each stage of its manufacture.





IN CANADA . . .

IRC Resistors are made in this modern factory in Toronto by the International Resistance Company, Ltd. Processes identical with those employed in the Philadelphia plant assure the same high-grade product, fully dependable for all radio and industrial uses.



Another part of the IRC Canadian factory showing a group of workers in the assembly department.

. . . IN ENGLAND

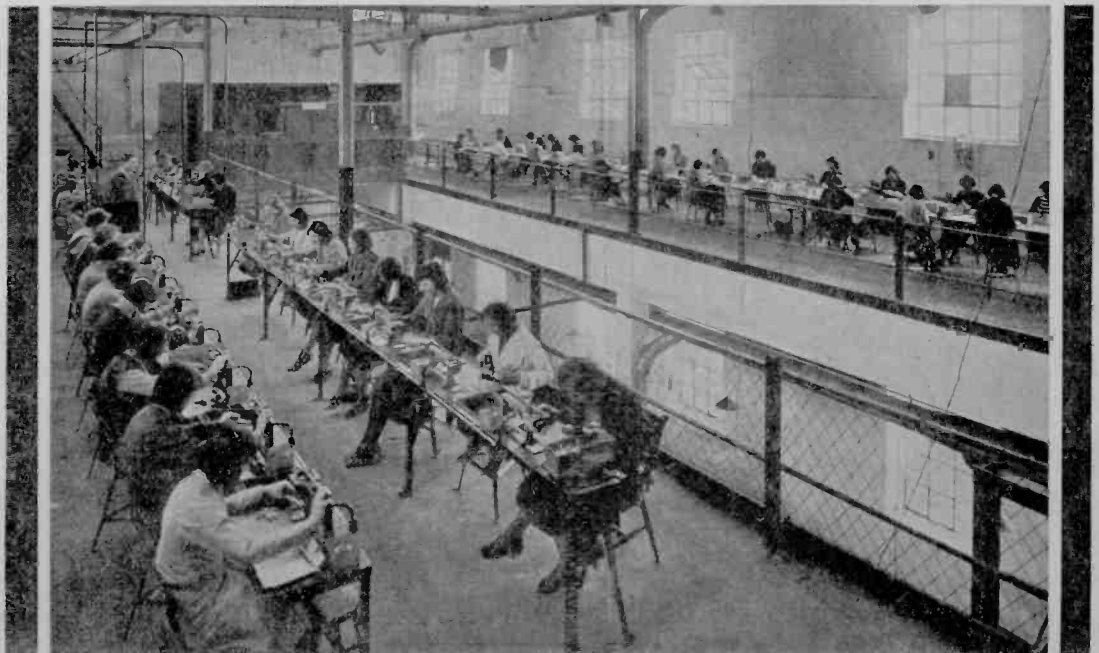
The assembly room of the London plant making IRC Resistors for the radio set manufacturers of Great Britain. The tremendous demand for these units in England is due to the recognized high quality and dependability of the product of this plant.

. . . IN EUROPE

Similar plants manufacturing the same resistors under IRC patents and processes are located in Copenhagen, Denmark; Paris, France; Berlin, Germany, and Milan, Italy.

. . . EVERYWHERE

IRC Resistors are used and regarded as the standard of excellence in every country of the world where radio is known.



IRC SERVICER

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No. VI DECEMBER, 1933 Vol. 1

A Personal Message to Servicemen

NOTHING would please me more at this time of the year, than to meet you personally, take your hand and extend heartfelt wishes for the Season's Best on behalf of myself and the entire IRC organization.

This being impossible, I am doing the next best thing and putting these wishes in print here in this little magazine which we have devoted to servicemen and which we sincerely trust is proving as helpful and interesting to you as we intend it to be.

There is a saying that type is "cold." Things are sometimes referred to as having appeared in "cold print." I hope, however, that this will not apply here. IRC is proud of its part in the great radio industry—proud of its products which have won a place of honor therein. Consequently, we have a warm personal interest in all who use them—in everyone whose interests are thus so closely linked with ours.

In the long run, a manufacturer's progress is limited solely by the quality of his products as judged by those who use them. Similarly, a serviceman can forge ahead no faster than is warranted by the quality of his work and the parts he installs.

In short, we are all on the same team. We are all working toward the same goal, though, to further the football simile, at different ends of the line.

Thus, perhaps we at IRC are not altogether unselfish in extending our wishes for your happiness and prosperity. For this very reason, however, I can assure you that they are all the more sincere.

And so this message comes—and I hope you will so regard it—as a hearty handshake, a slap on the back and a voice that repeats:

"Here's to a 1934, so Happy and so Prosperous as to Make the Past Four Years of Depression but a Dim Memory."

Ernest Searing

Important to Owners of Old Style IRC Resistance Indicators

DO YOU own one of the old style (prod type) IRC Resistance Indicators which is damaged? If so, we will gladly extend a special allowance on it toward your purchase of a new IRC Dual Resistance Indicator. Credit of \$1.20 will be granted upon return of your old Indicator. This means that the new one will cost you only \$1.65 (including 15c postage). The exchange will be made by any IRC jobber or direct from the factory.

The old style Indicator was designed as a low priced unit to be given gratis to purchasers of the IRC No. 6 Combination Kit. The fact was quickly established, however, that the Indicator was not only a necessity to every serviceman but one which was subjected to much harder and more continual use than had been provided for. As a result, some of the old Indicators were damaged and it is with the idea of replacing these that this unusual offer is made.

The new IRC Dual Resistance Indicator is the result of careful research by IRC engineers. Besides its many new features, it has been sturdily designed to stand up under any reasonable use. If you are not already familiar with this handiest of radio tools, ask your jobber for the folder describing its many uses and telling just how it may be employed to best advantage.

Throughout, the new Indicator is infinitely superior to the old one and it is with the thought of passing these improvements and advantages on to old customers in the fairest possible way that this exchange is offered.

NOTICE TO IRC JOBBERS: You are hereby authorized to make the above adjustment to owners of defective old style IRC Resistance Indicators. Credit will be issued to you upon return of the defective units.

HERE'S THE ANSWER!

30	39	48	1	10	19	28	175
38	47	7	9	18	27	29	175
46	6	8	17	26	35	37	175
5	14	16	25	34	36	45	175
13	15	24	33	42	44	4	175
21	23	32	41	43	3	12	175
22	31	40	49	2	11	20	175
175	175	175	175	175	175	175	

Here you have the answer to last month's Brain Twister. As you'll recall, the problem was to place the numbers 1 to 49 in such a position in the squares that, added vertically, horizontally or diagonally the columns will total 175.

Service Sam's Buddy Says:



Service Sam says his girl is a gold digger. She told him the other day that, if Cupid ever shot her, she hoped it would be with a Pierce-Arrow.

1st Serviceman: "Whatsa matter with the crooner that he didn't sing over station XYZ last night? Did he have a sore throat?"

2nd Ditto: "Nope. He had a cold in the nose."

The best way to be contented with your lot is to build a home on it.

"How much are they asking for your store rent nowadays?"

"Oh, about six times a week."

Nothing is worse for the memory than to borrow money.

"What's the matter with Pete's service business?"

"Poor resistance."

"Huh?"

"Sure. He can't resist the temptation to take a drink."

Here lie the remains Of Electrician Holts— He mistook twenty-two thousand For two-twenty volts.

"A little bird told me what kind of a serviceman your father is."

"What did it say?"

"Cheep! Cheep!"

"Well, a duck told me what kind of a doctor your old man is."

All that glitters isn't gold. If you don't believe it, just look at the seats of a lot of the pants that are being worn these days.

Serviceman: "You sold this second hand car to me a couple of weeks ago."

Auto Dealer: "Sure. I remember."

S. M.: "Well, would you mind telling me again all the nice things you said about it. I'm getting discouraged."

Perseverance as explained by the old darky minister is simply this: "Fustly you takes hold; secondly you holds on an' last but not least, you never lets go."

If you do no more than you get paid for—well, you'll probably never get paid for more than you do.

"I'm giving my girl a necklace that was once owned by a millionaire."

"What was his name?"

"Woolworth."

Surgeon: "Go get the name of that fellow who was smashed up in the auto wreck. I want to call his father."

Nurse (a little later): "He says his father knows his name."

Service Dope

(Continued from page one)

that the voice coil was gummed fast in the field slot, this evidently resulting from the fact that the set had been idle for a year.

On a Sentinel 660 with intermittent reception, Chet finally traced the trouble to the speaker and thence to the chassis plug in which there is an ordinary 4-prong tube base. A wire had become unsoldered in one prong.

Crosley 120 Series

"The tiny resistors used on some of these models seem to have a tendency to break down after a short span of life," writes Serviceman J. Frank Schuerman of Decatur, Illinois. "We have replaced all resistors on over 100 of these jobs with IRC's and never have had a failure. Some record, I'll say!"

Victor R-11 (Battery Operation)

Here's a tip on battery receivers from J. H. Southey, an IRC enthusiast of Pun-nichy, Saskatchewan: "If a Victor R-11 six tube set distorts when volume is turned on, try taking the grey wire off the volume control. If volume increases and greater clarity is obtained, it is a good indication that the screen grid by-pass condenser should be replaced."

Flickering Pilot Lights

Flickering pilot lights are, of course, generally caused by the tube fitting loosely in its socket. These can be held in place by a rubber band wound over both socket and bulb. If there is room to permit inserting pliers in the cabinet, the pilot light socket may be bent somewhat so that greater pressure will be exerted on the base of the light.

Send Along Your Service Dope

If you are finding these Service Dope items helpful—well, you can reciprocate nicely by sending your own dope along for publication to help the other fellow. Besides items of general interest, we now want to get some bang-up dope on auto radio—direct from you men in the field. How about it, fellows?

Take your pen in hand (or your typewriter in your lap) and address: Editor IRC Servicer, % International Resistance Co., 2100 Arch st., Philadelphia, Pa.

Unusual Service Calls

(Continued from page two)

Anyhow, it was only necessary to kill the bugs to repair the set. Music burst forth. It was rather tiny but centering of the speaker cone remedied that."

More next month. Watch for 'em. Meanwhile, send in your own unusual service call stories. The more informative and genuinely helpful they are the better we like them. For next month we are especially interested in obtaining unusual auto radio trouble cases. Kits of IRC Resistors are given to writers of the three stories published each month which, in our estimation, are most interesting. The right is, of course, reserved to publish any stories received whether or not they are awarded prizes. Address: IRC Servicer, 2100 Arch st., Philadelphia, Pa.

* * *

JOKE OF THE MONTH

"What'll people think of our business if you go into homes looking like that," said a dealer to his serviceman. Then he added: "Just look at your face. You didn't even shave this morning."

"But," protested the S.M., "I did shave."

"Well," replied the dealer, "next time, you'd better stand closer to the razor."

SWAP or SELL SECTION

These classified advertisements are run free for IRC Servicer readers. The right is reserved to edit advertisements or eliminate any considered unsuitable. Inquiries are forwarded promptly by IRC. As a matter of courtesy, advertisers are requested to answer all mail, even though the item advertised may have been disposed of or the inquirer's offer proves unacceptable. Due to space limitations, advertisements will be run as promptly as possible in the order of their receipt.

TRADE OR SELL— $\frac{1}{2}$ h.p. fan cooled a.c. 110-volt motor. 5,000 r.p.m. Chas. Mazi, c/o IRC Servicer.

TRADE OR SELL—Kurz-Kasch dial with condenser, 0-100-0. Also d.c. voltmeter 0-50. What have you to offer? B. L. Fisher, c/o IRC Servicer.

WILL BUY OR TRADE for some second hand testing and analyzing equipment. Please send full description and name lowest price. Ira L. Rodinsky c/o IRC Servicer.

WILL TRADE OR SELL—Extra parts including RCA 852 75-watt tube; Thordarson 1500-200 v. No. 2388 500 v.a. transformer; ditto, 12 v., 80 v.a. C.T. fl. transformer No. 2382; Thordarson double 18 h. 250 mill. v. ins. choke No. T2458. What have you to offer? Donald Jenkins, c/o IRC Servicer.

WILL TRADE—Wrist watch, value \$12, or pair of Johnson ice-skates with shoes, or violin outfit, value \$25, for ohmmeter 0-150 or Weston or Jewel 7 ma. in good condition. E. Griffin, c/o IRC Servicer.

WILL BUY—Late model standard make i.f. oscillator and tube checker. State lowest price. A. W. Dugan, c/o IRC Servicer.

WILL TRADE—Wheatstone Bridge, resistance box type, comp. with zero center 200 micro-amp. meter. Want good portable type-writer, preferably Remington. Bridge is std.

type made for electric manufacturer by E. S. Greeley & Co. and only slightly used. Earl V. Cahoon, c/o IRC Servicer.

WANTED—Back numbers of popular radio magazines, used text books, service manuals, etc. Name lowest cash price. R. D. Chapin, c/o IRC Servicer.

FOR SALE—Transmitting apparatus including Acme plate transformer 250 watt, 2200 volt; meters filament transformers, condensers, etc. Can use good a.c. radio or test equipment. Putzier Radio Service, c/o IRC Servicer.

SWAP OR SELL—32-volt generator; 245 Readrite tester; 25 watt 20-40-80 meter transmitter, etc. Want Readrite 710 tester or what have you? V. E. Willey, c/o IRC Servicer.

SWAP OR SELL—Acrocycle oscillator with calibrated scale, etc.; Jewell 209 tube checker; Philco tubes; Majestic B eliminator, etc. Want high resistance megohmmeter; capacity meter. Orville Faulstich, c/o IRC Servicer.

WILL TRADE—Jewell d.c. ammeter (75 amps.) and Philco AB-656 A & B eliminator for oscillator, analyzer, good microscope, test equipment or 6 volt d.c. to 110 volt a.c. converter. What have you? F. A. Lupton, Jr., c/o IRC Servicer.

WILL TRADE—1932 Official Serviceman's Manual for Weston 301 d.c. Milliammeter, 0-1 scale. W. E. Schwenzer, c/o IRC Servicer.

FOR SALE—Jewell Oscillator No. 563; Day-Rad Oscillator, No. 330, Day-Rad Output meter; Supreme Model 19 tube tester revamped for testing practically all tubes; Supreme Model 50 tube tester, etc., etc. Write for prices and descriptions. Bromley Electric Co., c/o IRC Servicer.

FOR SALE—Supreme 400-B Diagonometer with 3 Weston meters. Excellent condition. Cost \$140. Will sell for \$35 cash. Earl A. Hammond, c/o IRC Servicer.

WANTED—Will pay cash for tube testers, analyzers, meters and other test eqpt. Send list and name price. D & W Service Co. c/o IRC Servicer, c/o F. J. Adams, 31 Lilac st., New Haven, Conn.

FOR TRADE—One 220 volt, 60 cycle, single phase $\frac{1}{2}$ h.p. Emerson motor rated at 3,400

r.m.s. Make offer. Archie Stackpole, c/o IRC Servicer.

WILL TRADE—High grade plug type Wheatstone Bridge with built-in galvanometer. Cost \$165 new. Want good used Jewel or Weston professional test set or high-grade volt-ohmmeter. F. G. Hewlett, c/o IRC Servicer.

WILL TRADE—O-300 MA DC Bakelite case Weston meter for O-5 or O-10 MA DC same type. Also want same type in O-150 V. AC used. Can also use two electric clock chassis suitable for custom-built console installation. Must match. M. Mickelson, c/o IRC Servicer.

WILL BUY FOR CASH—A reliable list with detail addresses of independent radio servicemen. Or will swap for detail of money-saving equipment. Paul Ferry, c/o IRC Servicer.

FOR SALE—Weston 301 Multi-range DC Volt-ohmmeter. O-4.5, 45, 450 V. DC. O-10,000, 100,000, 1,000,000 ohms. Nearly new. Sell for \$12 plus 50c postage. Circuit included. W. G. Lorenz, c/o IRC Servicer.

FOR SALE—Ed. Kruspe Double Horn (made in Germany), F & Bb, low pitch, German silver—fine condition. With case \$110. Also 15-key, 4 ring clarinet, l.p. \$8. Will accept radios or supplies, testers, etc. as part payment. A. H. Hassler, c/o IRC Servicer.

WILL SWAP—Confidence tube checker 730 for Model "B" Confidence checker and pay cash difference. G. Payad, c/o IRC Servicer.

WILL SWAP—Transmitting and short wave apparatus, one phone and C. W. transmitter for test and service equipment. Want volt-ohmmeter or analyzer or what have you. Also have good used tubes to swap. Carl A. Rogers, c/o IRC Servicer.

WILL BUY—Oscillator Output Meter of standard make. Also tube checker that will test all latest tubes. State best price and give full description. Frank R. Foster, c/o IRC Servicer.

SELL OR TRADE—Radio parts, etc., including two Western Electric talking and ringing magnetos; two super B Majestic eliminators with tubes; one Westinghouse 16" oscillating fan. State your price or what you have to trade. Would like to purchase Vol. 142 Rider's Perpetual Service Manual. Walter Schloetzer, c/o IRC Servicer.