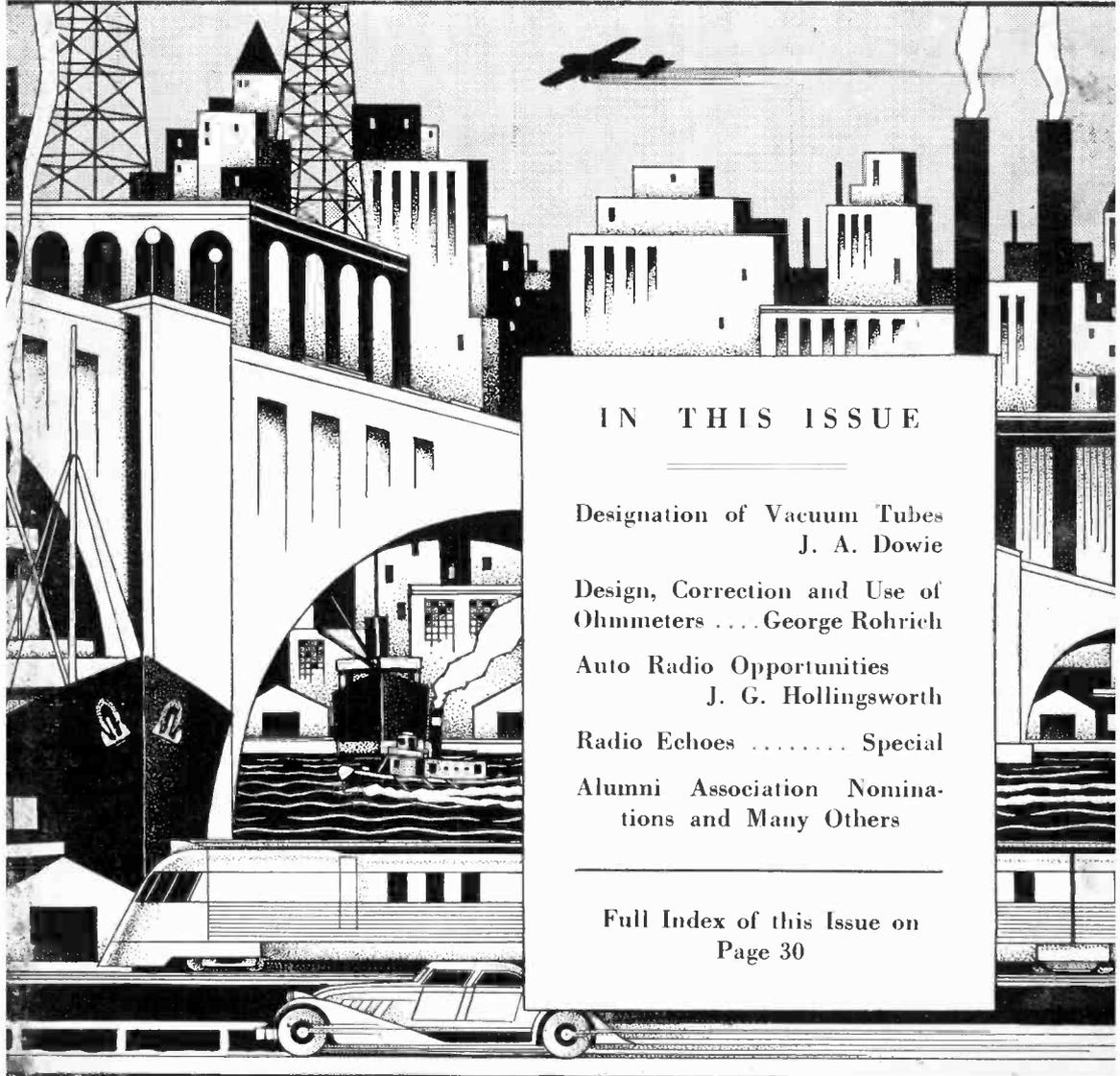


# National *RADIO* News

Vol. 8—No. 4

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J. E. Smith

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AS it comes time for me to write my page for this issue of NATIONAL RADIO NEWS I find myself in a story telling mood. I have two stories in particular that I'd like to relate, briefly, and I hope that you may derive the same lessons from them that I did. The first one is about a baseball game which I saw not so long ago:

#### *Hitting in the Pinches*

I don't think I'll ever forget that game—the one played on August 25th between the League leading Detroit Tigers and the Washington Senators.

Detroit's pitcher, "Schoolboy" Rowe, had won fifteen straight games. He was in there this day to try to make it sixteen straight—to tie the American League record held jointly by such famous pitchers as Walter Johnson, Lefty Grove and Joe Wood.

What happened in that game is history now—Detroit won, 4 to 2, "Schoolboy" Rowe won his game and took his place in the baseball hall of fame. But *how* he won it—that's the big point.

Pitching fine baseball he held the Senators to only two runs—but until the 9th inning his teammates could not get the necessary hits to overhaul that lead.

In the ninth inning, when it looked like the game was lost, Greenberg, Detroit's first baseman drove a home run over the right field fence and tied the score. *That's hitting in the pinches.*

And then, it was Rowe, the pitcher, who made another hit which was directly responsible for winning the game. *That is also hitting in the pinches.*

The old-timers used to have a habit of saying "strike while the iron is hot" but we modern

folks are more apt to call it "hitting in the pinches." The lesson I learned from this game is that first we must be trained, well trained, to do the job at hand. "In condition," athletes call it. Then we must plan our work so as to take advantage of every "break" that presents itself. But, the real test of a man comes when things are not looking so good—when business is not at its best, when the "breaks" seem to be going against him. It is then that he has his opportunity to come through as a "pinch hitter" and drive in the runs that will win the game.

— n r i —

My second story has to do with going after business. It shows how business can be obtained in unusual—unthought-of places and with unusual methods.

#### *A Radio-Trician Who Went After Business*

George Newton, a Radio-Trician, was on his way home to dinner, having just finished up a service call. He had no more calls for that day—and as George was a very successful Radio-Trician—one who had many calls to make—the experience of having a whole evening off was somewhat unusual.

He had put his car in the garage, which was about a block from his home, and was walking the remaining distance when he passed an open window and heard the rasping tone of a Radio receiver which was evidently badly in need of repair.

Without a moment's hesitation he rang the doorbell of that house and introduced himself as a Radio-Trician. He told the lady who answered the door that he had heard her Radio from outside and had detected that it needed attention. He suggested that he be allowed to look at it.

To which the lady replied: "Yes, my Radio has been cutting up like that all day—and 'it would,' just at this time when I'm going to have company this evening and wanted to use it."

"Then," suggested George, "let me take a look at it and I'll see how long it will take to repair it. Maybe I can do the job at once."

This met with approval, but George found that the job was one which would require more than the few hours he was allowed between five and the time of the party. He told the set owner this, and the lady was in a quandary. She wanted her set for that night but she hated to impose its terrible music on her guests. George solved the problem by offering to lend her his own set to use during the evening; repaired hers and returned it early the next day. Not only did he obtain a service job—but he made a good customer.

That's just one of the dividends paid to fellows who go out after business.

# Designation for New Vacuum Tubes and What it Means

By J. A. Dowie, Chief Instructor

THE code for new vacuum tubes provides in general that there be both numerical and alphabetical designations. The prefixed designation gives an indication of the filament or heater voltage.

The figure 1 (first digit or two digits), is used for voltages below 2.1 (2 and 1/10th) volts, 2 is used for voltages between 2.1 and 2.9 (2 and 9/10ths) volts, 3 for voltages between 3 and 3.9, 4 for voltages between 4 and 4.9, 5 for voltages between 5 and 5.9, 6 for voltages between 6 and 6.9, etc.

The voltage designation for filament or heater, therefore, indicates that the voltage is greater than that number specified, but not as great as the next succeeding whole number.

When the filament voltage is a whole number, the number generally specifies the voltage exactly, that is 25 volts, whereas to avoid confusion with existing designations, some tubes are strictly classified, that is, the 2 volt series takes the prefix "1" to avoid a mistake between 2 volt and 2.5 volt tubes.

The alphabetical (or second digit) order is A, B, C, etc., for amplifiers and detectors, and Z, Y, X, etc., for rectifiers. That is, the progression is away from A for first, second, third, etc., group of detector and amplifiers, and away from Z for the group of rectifiers.

The necessity for this is due to the fact that tubes with apparently the same construction and filament voltage would require the same numerical suffix and prefix, and to distinguish them a different letter is used.

The suffixed numerical designation (third digit) gives an indication of the number of use-



J. A. Dowie  
N. R. I.  
Chief Instructor

ful elements of the tube brought out to terminals.

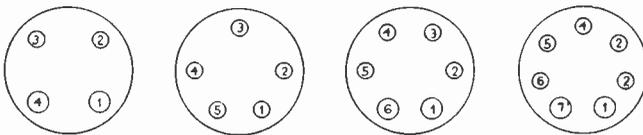
For example: the 2A5 is an amplifier tube having 2.5 volt filament or heater, with five useful terminals brought out, the 1A6 is a 2 volt filament, oscillator-detector tube with six useful terminals brought out, the 6A7 is a 6.3 volt heater detector-oscillator with seven useful terminals brought out, the 25Z5 is a 25 volt heater type rectifier with five useful terminals brought out.

## TOP OF SOCKET-ELECTRODE CONNECTIONS

R. M. A. STANDARD—Looking at the pins of the tube base. Bottom of chassis or direct toward pins as shown in Figure 1(b), one filament or heater pin (large pin in the case of 4, 5 and 6 pin bases) is numbered 1, and the numbering carried clockwise around the pin circle to the other filament or heater pin.—Note: If you look on the tube socket top of chassis or tube base top of tube, the right hand filament pin is 1 and numbering is then carried counter clockwise to the other heater or filament pin, as shown in Figure 1 (a).

For general service work it is worth remembering that, as a rule, pins 1 and 4 for a 4 prong tube, 1 and 5 for a 5 prong tube, 1 and 6 for a 6 prong tube, and 1 and 7 for a 7 prong tube, are the filament or heater terminals. Invariably 2 is the plate connection; and 4 for a 5 prong tube, 5 for a 6 prong tube and 6 for a 7 prong tube are the cathode connections provided the electron emitter is indirectly heated. Generally, the top cap, is the control grid. These fundamental facts plus a knowledge of the exceptions, will simplify service work when a free point set analyzer is being used.

a: PIN NUMBERS - SOCKET TOP OF CHASSIS OR TUBE BASE TOP OF TUBE



b: PIN NUMBERS - SOCKET BOTTOM OF CHASSIS OR TUBE DIRECT TOWARDS PINS

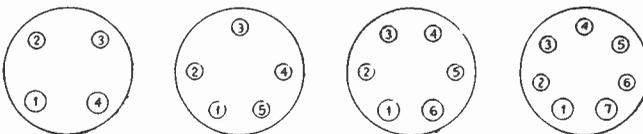


Figure 1



# A Few Words With The N.R.I. Director

E. R. Haas,  
Vice-President  
and Director

## Receiving Set Definitions Changed

The Radio Manufacturers Association has eliminated the term "dual wave" for the "standard and short wave" receiving set having a frequency range between 4,000 and 20,000 kilocycles. To this extent the original definition for this type of receiver has been modified. The three classes of receivers are therefore:

1. The "standard broadcast" receiver, frequency range from 540 to 1,570 kilocycles, to include recent extension of the broadcast band.
2. The "all wave" receiver, frequency range from 540 to at least 18,000 kilocycles.
3. The "standard and short wave" receiver, having frequencies between 4,000 and 20,000 kilocycles.

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## More Servicing

It is whispered (it's a pretty big whisper by now) that RCA-Victor is going to bring out amateur talkie cameras so that anyone can make their own personal sound pictures.

Sixteen millimeter film will be used with a narrow sound truck on the side. What with talkie cameras and talkie projectors in the home, it looks as though the Radio service man may go Hollywood in his own locality.

— n r i —

## Japan Plans To Build More Powerful Stations

The Japan Broadcasting Corporation is laying plans to increase the power of its various stations, according to a report to the Commerce Department from Assistant Trade Commissioner D. W. Smith, Tokyo. Application has been made by the corporation to the Department of Communications for permission to increase the transmitting capacity of its Tokyo station from 10 kilowatts to 150 kilowatts.

The corporation plans to increase the capacity of the Osaka station from 10 to 100 kilowatts within the next two years. The present stations at Niiigata and Nagasaki will be enlarged during 1935-36, according to present plans.

New broadcasting stations are now under construction at Kagoshima, Toyama and Kogu, which will be opened during the latter part of the present year.

Japan has nearly 2,000,000 listeners, who pay a license fee.

Page Four

## World's Busiest Station

With inauguration of air commuter schedules every hour over the Chicago-New York division of the coast-to-coast airway, Station WUCG of United Air Lines, at the Chicago Municipal Airport, is "the world's busiest Radio station." WUCG is one of the thirty-five ground Radio stations United has spotted over its airway, to make it possible for pilots at all times to be in voice communication with a ground dispatcher.

This station averages approximately 600 different calls daily to planes in flight and to other ground stations every day, nearly one call every two minutes. United has as many as twenty-five planes in the air at one time.

Flyers report their location, altitude, temperature and other information, and receive from the ground stations reports on weather conditions and other data.

In addition to United Air Lines' short wave communications, the long wave Airways Radio stations of the Department of Commerce come on the air twice hourly to broadcast weather reports, and likewise they constantly broadcast directive Radio beam signals marking the course of the airway.

**CROSLEY MODEL 120 INOPERATIVE**

This is often due to failure of the dynatron oscillator to oscillate, especially when the receiver is dead over the lower end of the dial. Such trouble has been traced to an oxidized flat-head screw and stationary plates of the padding system for the low frequency end of the oscillator. All contacts should be cleaned and a washer should be placed under the flat-head screw to put tension on the contact after the screw has been tightened down.

**CLARION MODEL 320 INTERMITTENT RECEPTION**

This is often caused by a poor connection in the first I.F. transformer at the point where the flexible lead connects to the coil winding. The 8,900 ohm oscillator bias resistor should also be checked. Sometimes it is worth while to reduce the value of this resistor by 2,000 or 3,000 ohms.

**ATWATER-KENT MODEL L OSCILLATION**

When this action occurs with the sensitivity switch in the local position the trouble is usually due to coupling between the wire leading to the switch and the R.F. choke. The wire should be bent away from the coil opening.

**ATWATER-KENT MODEL 82 OSCILLATION**

Try replacing the A. V. C. plate bypass with a new .25 or .5 microfarad condenser. Intermittent reception in this set is often due to a faulty screen grid bypass condenser. A new one should be tried.

**ATWATER-KENT MODELS 80, 82, 83, 84 & 85 INTERMITTENT WHISTLE**

An intermittent squeal or whistle near 700 kilocycles can be cured by replacing the grid leak of the oscillator 27 type tube with a 50,000 ohm resistor.

**ATWATER-KENT MODELS 67 & 67B TOO MUCH VOLUME ON LOCALS**

Look for an open in the black wire leading from the control to the off-on toggle-switch or for a poor contact in the switch itself. If shorting the switch cures the trouble open it

up and bend on the contact spring or, if necessary, replace the switch with a new one.

**ZENITH MODEL 750 DEAD**

If the grids of the I.F. tube become red hot look for a shorted I.F. transformer. This is caused very often by the leads of one winding touching those of the other winding.

**SPARTON MODEL 120 OSCILLATES WHEN WARM**

If the receiver functions correctly until it becomes hot, increase the value of the bypass condenser across the cathode resistor. Sometimes it is necessary to employ a condenser as large as 1 microfarad to obtain stability.

**RCA-VICTOR MODEL R78 INTERMITTENT OSCILLATING & MOTORBOATING**

This trouble is usually caused by a dirty contact between the rotors of the tuning condensers and the chassis. Inspecting and cleaning the wiping contacts will clear up the trouble.

**RCA-VICTOR MODEL M30 FUSES BLOW**

If the fuses blow as soon as the receiver is hooked up the trouble is probably caused by shorted .03 microfarad condensers in the vibrator base unit.

**PHILCO MODEL 70 HOWLING**

This trouble is usually due to vibration of the condenser plates. If the rubber washers on which the gang condenser is mounted cannot be replaced a repair can be made by placing the rubber washers on which the set is mounted under the chassis. When this is done the bolts should be left loose in order to obtain a floating effect.

**PHILCO MODEL 70 MICROPHONIC HOWL**

If this condition occurs when the tone control is turned all the way to the left check the .00025 microfarad phone condenser connected to the plate of the second detector. This condenser has a yellow dot on one side and causes the trouble due to changes in its value or to its becoming open.



# Design, Correction and Use of Ohmmeters

( Section 2 )

George Rohrich  
Engineer in Charge  
N. R. I. Laboratory

**M**ANY service men have voltmeters without ohmmeter scales marked on the meters, or they have millimeters and several variable resistors which they can readily connect in series with a battery for use as ohmmeters. Then the deflections obtained on any voltage scale or current scale may be used to find the value of an unknown resistance, simply by using the procedures given below: If the resistance of the meter is not known the first procedure is to find this value. This resistance can be found if you have an accurately known resistance available.

1. Connect the voltmeter (or milliammeter with any suitable series resistor) to a battery as shown in Fig. 3. Record the reading. This reading may be recorded from any voltage or current scale on the meter.
2. Place the known resistance in series with the circuit and record the reading taken.
3. Divide the first reading by the second reading, subtracting 1 from the result.
4. Divide the value of the known resistance by the result obtained in the third procedure, above. The result will be the value of the internal resistance of the meter circuit.

The above procedure may be placed in symbol form as shown below:

$$R_m = R_k \left\{ \frac{D_1}{D_2} - 1 \right\}$$

Where:

$R_m$  = Resistance of meter.

$R_k$  = Known resistance in series with meter.

$D_1$  = Deflection obtained without having  $R_k$  connected.

$D_2$  = Deflection obtained when  $R_k$  is connected.

*This is the second and concluding section of an article by Mr. Rohrich. The first section appeared in the August-September issue of National Radio News. The drawings, Figures 1 and 3, above, are reprinted here for your convenience.*

Page Six

In order to illustrate the work with an example let us say that your arrangement consists of a meter marked in volts or milliamperes from zero to 5, as shown by the bottom scale of Fig. 1, and that you have a known 1000 ohm resistor.

The first thing to do is to select by experiment a battery voltage, and a resistor R if necessary as shown in Fig. 3, which will give a deflection that is limited on the scale of the meter. The resistor R may or may not be necessary, depending on the amount of resistance already present in the meter.

Let us say that you have obtained a deflection of 4.5 for  $D_1$ , and when you connected the 1000 ohm resistor in series with the arrangement you obtained a deflection of 3 for  $D_2$ .

We then divide 4.5 by 3 and obtain 1.5 and when we subtract 1 from this we obtain .5 for the third procedure.

Divide 1000 by .5 and you get 2000 ohms for the resistance of the voltmeter.

Now, with the resistance of the voltmeter being known you can determine the value of an unknown resistance by rearranging the formula.  $R_k$  is now replaced

by  $R_x$  as this latter quantity is unknown until the right-hand portion of the formula is determined.

$$R_k = \left\{ \frac{D_1}{D_2} - 1 \right\} R_m$$

This formula tells you that the value of unknown resistance can be found by dividing the first deflection by the second deflection, then subtracting 1 from the result, and multiplying this by the value of the meter resistance.

The formula also can be rearranged for marking out an (Page 28, please)

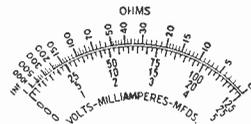


Fig. 1.

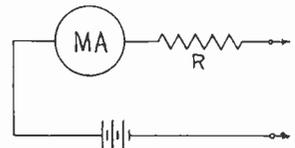


Fig. 3.

# How I Make Money In Public Address Work

By L. J. Saunders,  
N. R. I. Graduate, of  
Wewoka, Oklahoma



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Graduate Saunders and his "red truck" which are becoming famous throughout Oklahoma.

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I WANT every N. R. I. man to have the benefit of my experiences and profit thereby. I say this because I feel that I have been successful and what I have done other N. R. I. men can also do.

I started out in May of this year to get some of the public address business which was brought about by the election.

After putting in about three weeks of hard work—which required quite a bit of patience—I got a mobile address outfit in operation. It is shown in the accompanying picture.

Incidentally—I believe this picture will tell enough about the success of this work so that I won't have to go into very much detail.

The cards which you see on this truck netted me \$5 apiece and both sides of the truck were filled up in no time. I had twenty-five cards mounted on the sides of the truck—one on the front, and one on the rear. Besides these cards, I rented the truck to various candidates for \$15 a day for use in making speeches and advertising themselves—and to others who wanted to use it, for speeches and various purposes at \$1 for each five minutes of use. I was kept plenty busy.

I have some more state election work coming up in the very near future. Of course, it was not all clear and easy sailing—it was no bed of roses. I had my ups and downs. For instance, one of the candidates for Governor withdrew

from the political race, and the plans I had made for this fellow went haywire, of course. This set me back a couple of weeks—but I've already made up that time with some new work that I have gotten lined up.

My business has grown to such an extent that I will have plenty of local work to do even after the elections are over. I expect to be able to continue in this work and make a success of it in the future, as I have in the past. The publicity that I have obtained for my business and my "red truck" during these elections has done me a lot of good, and I am becoming better known all over the state.

I further want to tell every man who reads this article that my knowledge of Radio and public address systems, which has enabled me to put this business across, is due 100% to my N. R. I. Training. In other words, I give N. R. I. Training more credit than I give myself. I think N. R. I. men at various points over these United States, should get hold of a sound truck and get into this business. I think it's a paying proposition—one with a big future.

I have had the idea for some time that this was a good branch of the Radio field to be in—and intended writing my ideas in to the school. But before giving out these ideas, I wanted to test them out myself and make sure I was right, before passing my opinion along to anyone else.

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ALLIED Radio Corp., 833 W. Jackson Blvd., Chicago, announces publication of its new 1935 Radio catalog which will shortly be available for distribution. N. R. I. students and Alumni are invited to write for their FREE copies for preferred delivery as the first books come from the press. The new 1935 ALLIED catalog will be filled with a complete, high grade stock of replacement parts for every service job, every leading make of test equipment, an amazing

presentation of P. A. equipment, the finest and latest All-Wave and European range sets, a complete selection of set-building kits, etc. ALLIED extends to all N. R. I. men the service aids at its disposal, descriptive literature, diagrams of all Knight receivers, technical information, and quotations for circuits appearing in any magazine or handbook. These services are free to N. R. I. members. Write for the new 1935 ALLIED catalog at once.

# General Service Hints

By J. B. Straughn, N. R. I. Service Consultant

Here is a new department which will bring you regularly, some very valuable information. In our "Service Forum" (see page 5) we discuss service problems on *specific receivers*. In this new department we cover *general information* which applies to many receivers. Send us your General Hints. Also suggest subjects you'd like discussed. Address your letters to "General Hints" Department, National Radio News, 16th and You Sts., Washington, D. C.



## Removing Stuck Friction Type Dial Knobs

Most new sets use knobs that are simply held on by friction. Ordinarily they may be removed by pulling them with the fingers. It often happens, however, that these knobs stick.

Take a pocket handkerchief or other piece of cloth and pass the edge of the cloth between the knob and cabinet. Then pull the knob off its shaft by drawing on the ends of the cloth. This applies the pressure evenly. *Never pry a knob off with a screw-driver* as the cabinet will be damaged and the knob may be split.

## Methods of Preventing Oscillation

There are a number of quick trick methods by which the serviceman can stop oscillations. However, the following methods for preventing oscillations are to be *used only in stubborn cases which do not yield to the usual treatment* (which consists of locating and repairing or replacing the part causing the oscillations).

See if the set is equipped with a line voltage switch. If so, set the switch in the high voltage position—thus reducing by a small amount the voltages applied to the tube elements. Another trick is to throw the trimmer condensers on the condenser gang slightly out of alignment. Usually only two trimmers need be misaligned. Turn one a fraction of a turn to the right and the other the same amount to the left. Don't try this on superheterodynes unless you know which is the oscillator trimmer, as this condenser should not be touched.

Still another method popular among servicemen, and used on old sets having unshielded coils and no trimmer condensers to misalign, is to take a short piece of ordinary hook-up wire and make a single tight loop around the center of one of the R.F. transformer secondaries. Should oscillations continue, scrape the two ends of the wire loop and twist them together thus completing the loop electrically.

In screen grid sets oscillations are sometimes caused by coupling between the control grid leads. These should be stuffed into the coil cans as far as possible. Rough shielding of these leads can be accomplished by using ordinary cotton covered bell wire, grounding one end of the wire and wrapping the rest around the control grid lead. This will slightly detune the receiver in addition to shielding the leads, so

partial realignment may be worth while. Another common trick on screen grid sets is to reduce the screen voltage by means of a series screen resistor. The resistor must be inserted in the circuit in such a way that one lead of the screen by-pass condenser is connected between the screen and resistor.

Grid suppressors must not be overlooked. A 1000 ohm resistor connected between the control grid of an oscillating tube and its tuning circuit will usually stop oscillations. Larger values can be employed but the smallest size which will give satisfactory results is to be preferred.

## Paper Filter Condensers and Their Temporary Repair

A broken down paper filter condenser need not always be replaced at once. It is sometimes possible to repair them by a process known as "shooting." The repaired condenser can then be used while a replacement is being ordered. Cases have been known where such condensers have lasted over a year after being "shot" but the serviceman who is out to build up his business will not trust his reputation to a doubtful part.

When a condenser breaks down the dielectric is punctured and the two foils of which the plates are made come into electrical contact with each other. This foil is very light and it will disintegrate easily under heat or a high electrical current. The application of a fairly high voltage across the bad condenser will often burn up the foil at the point of contact thus repairing the condenser by removing the short.

The line voltage, whether it be A.C. or D.C. may be used. A 75 watt light bulb should be placed in series with one of the line leads to protect the line fuse. Then the two test leads should be touched across the condenser. The lamp should light up to almost full brilliancy due to the short. If the repair is successful the lamp will suddenly dim, showing the condenser is no longer shorted.

It is not worth while to leave the condenser connected to the line more than half a minute,

(Page 29, please)

# “I’m Going to Have A CODE of My Own!”

**W**HO am I? I’m a typical N. R. I. student . . . a fellow just like you—with the same slant on life and the same big ambition—to succeed in Radio.

Now the papers and magazines are full of CODE talk. There’s the National Recovery Administration and its codes—wholesale codes—retail codes. And there’s a lot of talk about Code Authorities and Jewelers’ Codes—Clothing Codes—Radio Codes; Codes of fair practice and what-not.

I know the general idea behind all of this is recovery from a business depression—but frankly, that’s all I know about it. Why? Because I’m more interested in Radio and in my personal success and future than in those Codes. Not that I’m against these ideas. Not at all. I’m for anything that means recovery and prosperity—but I’m going to let the other fellows—those men in Washington who get paid for it worry about their Codes.

But I’ll tell you what I’m going to do. I’ve gotten slightly “Code-minded” myself and—I’m going to have a Code of my own—my own personal Code—for my own good. And here’s how it reads.

Purpose: Personal success.

To begin: At once.

To terminate: Only when I have reached the goal I’ve set for myself—the top of the ladder of success in Radio (and maybe not then).

Article 1. I will devote at least one hour a day (and as much more as possible) to the study of my N. R. I. Course.

Article 2. I will place my studies before pleasure and recreation—knowing full well that study now means pleasure in the future.

Article 3. I will do all the practical Radio work I can handle in order to get additional practical experience.



Article 4. I will be fair in all my dealings with my customers because I know that is essential to my success.

Article 5. I will be fair in my prices, giving at least dollar for dollar value to my customers—and maybe more—never less.

Article 6. I will keep myself personally presentable at all times—be polite—courteous—and tactful in all my dealings.

Article 7. I will maintain my health at a high degree in order to be personally efficient.

Article 8. I will keep my mouth shut except when I can speak well of persons and things.

Article 9. I will refrain from arguing with customers and prospects.

Article 10. I will check myself on each of the above points daily, knowing full well that the successful man cannot afford to slip up on a single one of them.

I don’t have a copyright on any part of this Code so you can use it as your own property and for your own success.

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## DO YOU LIKE THIS ISSUE?

This is the first issue of our bigger, better NATIONAL RADIO NEWS. We hope you like it.

NATIONAL RADIO NEWS will bring you more of the material for which you have shown a preference, as indicated by the many letters we have received on the subject. All of the old departments of “THE NEWS,” which have been popular, are being continued. New departments will be developed containing what you want and what you need.

We are open to suggestions. This is your magazine and we want to make it what you want it to be. We want you to tell us if you like it and if you have suggestions for its betterment. Only by having your constructive criticism will we know what you really desire. Won’t you tell us what you think of this issue? Drop us a line, addressed to “The Editor, NATIONAL RADIO NEWS, 1536 You St., Washington, D. C.”

# SIXTEEN YEARS WITH N. R. I.

NATIONAL RADIO NEWS wishes to take this opportunity to congratulate one of the National Radio Institute's real "old-timers" on his sixteen years of faithful service with the Institute.

Edward L. Degener, N. R. I. Director of Publicity, is the gentleman to whom we refer.

Mr. Degener was educated at high school in Percy, Illinois; business college at Centuria, Ill.; George Washington University, Washington, D. C., where he studied civil engineering, and Southeastern University, Washington, D. C. While attending George Washington University he was employed by the United States Government.

After the United States entered the World War, Mr. Degener resigned his Government position to join the Student Army Training Corps which was organized at George Washington University for the purpose of training college students for officers' commissions.

It was back in 1918 that Mr. Degener affiliated himself with the National Radio Institute and he has been with this organization ever since. Among the many positions he has held with the Institute in his sixteen years of service are Bookkeeper, Auditor, Student Service Director, Sales Director, Office Manager, and Publicity Director.

At the present, Mr. Degener's job is the important one of keeping the name of the National Radio Institute, its students, and graduates



E. L. Degener, N. R. I. Director of Publicity, completing sixteen years' service with the Institute.

constantly before the Radio Industry and the general public.

It is impossible to even estimate the enormous amount of benefit students and graduates of National Radio Institute have derived from his activities. Many new job connections are developed with Radio employers; much spare time and full time Radio service work developed, for students and graduates who are operating as independent service men, by reason of the enormous amount of publicity created by Mr. Degener. The successes of many men who have taken the N. R. I. Course of Radio training are in a great measure due to the efficient operation of Mr. Degener's Department.

You hear very little of the activities of this Department, but its work goes on, just the same, continually paving the way for Institute students and graduates, gain-

ing for them more recognition, making their roads to success easier—more rapid.

Since the success of its students and graduates is in a very great measure dependent upon the growth and prestige of the Institute, and since Mr. Degener has contributed to such a large degree to the Institute's growth and prestige, we know that all of our readers will join us in wishing Mr. Degener many more happy and successful years with the National Radio Institute.

*His hobby is golf and he has had the pleasure of defeating your editor on numerous occasions.*

— n r i —

## PRINTERS FOR POLICE CARS

Heretofore, when a message was sent from Police Headquarters, there was no permanent record of its receipt by the car for which it was intended. However, with a new invention perfected by W. H. Finch, Hasbrouck Heights, N. J., this difficulty has been eliminated.

With this new apparatus which operates by Radio, messages are received in the Police Cars by means of a printing machine somewhat similar to the teletype machines.

According to the information received by

NATIONAL RADIO NEWS, this apparatus weighs only eight pounds, measures only twelve by fourteen inches and operates from a six-volt battery in the car. It is reported that it can receive from thirty-five to forty words per minute.

Due to a system of scrambling the messages it is impossible to understand them except by knowing the code used by the Police Department, and this code, for added secrecy, can be changed daily.

# START--Where The Other Fellow Leaves Off

By T. E. Rose, N. R. I. Student Service Department

“**W**HY should I study text books? The only way to *really* learn anything is to go out and get experience doing it!”

Did you ever hear a fellow talk like that?

Most likely you have. Lots of folks have the idea that “book learning” is a lot of nonsense and that *experience* is the only teacher.

Well, *experience* is a good teacher in many ways—and naturally everything you learn should be followed up by experience, if you are to get the most out of your training.

But the fellow who depends upon experience *alone* to get him what he wants, starts out on a hopeless task. Of course, you can learn to dig ditches, chop wood and perform other purely mechanical acts, by experience alone.

To succeed, however, in any *worth-while* profession, you must find out—through study and research—about the experiences of those who have gone before you. By drawing upon the experiences of others, you can start where they left off. A lifetime is much too short for *any* man to accomplish very much, through his own experience alone.

As an outstanding example of what I mean about making progress by drawing upon the experiences of others, let's just briefly trace a few stages of the development of the science of Radio:

In 1867, Prof. Maxwell of the University of Edinburgh, outlined theoretically the action of other waves, as used in Radio at present—

Heinrich Hertz, taking Maxwell's theory, proceeded to prove this theory in 1886, by creating and detecting electro-magnetic waves.

A number of prominent scientists then used the discovery made by Hertz and began experimenting further with the transmission and reception of Hertzian waves.

Giuglielmo Marconi was a pupil of one of these scientists and by the end of 1897 he made transmitting and receiving instruments that “wireless” from a ship to a shore station at Salisbury, England—over ten miles away.

Dr. Fleming improved on Marconi's receiver, and in 1904 invented the Fleming “valve,” the first tube used in Radio reception.

Prof. Fessenden of the University of Pittsburgh improved on Marconi's transmitter and in 1906 invented a Radio frequency alternator which produced a continuous wave, far more efficient than the waves created by the spark transmitter.

In 1906, Dr. Lee De Forest (a member of the



N. R. I. Advisory Board) improved the Fleming valve, and thereby developed a tube practical for transmission, as well as improving its receiving efficiency.

— and so the development of Radio goes on!

One man learns—through the study of books and other written material what other men have already found out. Then he takes this information and starts getting further experience of his own. He *starts* where all the others left off.

This is truly a wonderful process, when you stop to think of it—truly wonderful to realize that most of the scientific progress of the world has been made possible by the books and similar records, which set forth that which has already been accomplished.

Instead of spending a lifetime finding out what someone has already learned before, the student of books reads about what has already been accomplished and proceeds to go forward from that point.

Why, did you ever stop to realize that after you study even the first few lessons of your N. R. I. Course, you know *more* about Radio and Electricity than the most famous scientists knew, only a few years ago?

Doesn't just the thought of this fact help you understand more clearly what great opportunities N. R. I. training opens up to you in the field of Radio?

Radio itself has only *started* to unfold its many wonders—a fact proved by the revolutionary developments taking place constantly—such as the introduction of the all-wave and the high fidelity receivers, the perfection of Aircraft Radio, the recent construction of a 500,000 watt broadcasting station, the progress being made in the field of Television, and so on and on!

And YOU, as an N. R. I. man, *start* your career—start into the Radio profession at this threshold of great development and progress—with knowledge that it has taken leaders of the Radio Industry most of their lifetime to acquire.

**S**PECIAL signals are being transmitted from two European Radio stations for the study of long-delay echoes. The signals and the whole undertaking are adapted to the participation of persons all over the world who have high-frequency receiving sets, no technical training being required. Long-delay echoes are a most surprising and baffling phenomenon.

J. Huls was listening in Norway, one day in 1927, to telegraphic signals from station PCJJ in Holland on a frequency of about 9,600 kc/s. Some of the signals were followed, after about 3 seconds, by a faint echo or reproduction.

Echo signals occurring one-seventh of a second after an emitted signal had been well known, being due to the reception of waves that had traveled all the way around the earth. But the discovery of echoes after a materially greater interval than a seventh of a second immediately raised the puzzling question of where such an echo could come from.

The phenomenon has been verified in a few scattered observations by Dutch, British, and French engineers. Echoes have been heard from 1 to 30 seconds after the emitted signal. Not enough is known, however, to determine what causes the echo signals nor how they are propagated. Two theories have been proposed. One, by Dr. C. Stormer, of Norway, is based on the assumption that there are streams of electrons in space some hundreds of thousands of miles out from the earth's equator, converging in a vast toroid upon the magnetic poles of the earth, and accounting for the aurora borealis or northern lights. Dr. Stormer supposes that the signals are reflected from these electron streams in space.

According to the other theory, advanced by Dr. B. Van der Pol and Prof. E. V. Appleton, these echoes are due to a slowing up and reflection of the waves by a peculiar distribution of ionization in the very high levels of the ionosphere (that portion of the atmosphere 65 miles and more above the surface of the earth which is responsible for all long-distance Radio transmission).

The British Broadcasting Corporation through its magazine, *World-Radio*, and with the aid of Professor Appleton, has just inaugurated a worldwide endeavor to learn more about these long-delay echoes. Special emissions are provided from two high-power, high-frequency stations to facilitate observations by anyone who cares to listen with a high-frequency receiving set. Listeners in all parts of the world have been enrolled in the endeavor, over 10,000 of them in Great Britain. It seems likely that information of unique value to science will result, and an orderly explanation of the curious phenomenon developed, when definite data are secured on the frequencies and the times of day and season at which these echoes occur, their

(Page 21, please)

The D. R. Bittan Sales Company, Incorporated, 27 Park Place, New York City, is now representing the Ohmite Manufacturing Company for the New York territory. Mr. Bittan wishes to announce to all readers of *NATIONAL RADIO NEWS* that a copy of Ohmite's latest catalog can be secured by writing to the Ohmite Manufacturing Company, 636 North Albany Avenue, Chicago, Illinois. In addition to numerous other items this catalog explains a new line which has just been developed, consisting of multi-volt resistors.

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## A Contribution

This is the first time I have offered any contributions to the *NATIONAL RADIO NEWS*, although I have obtained a great deal of helpful hints from this service and from my fellow readers, I believe it is about time I woke up and gave my fellow readers a few service kinks in return.

### Majestic—Model 90

This set would rumble or even stop when a door was slammed or when the set was jarred. Increased volume would also result in the set shutting off.

After several hours of testing I traced the trouble to the variable condensers. The front bearing had been oiled and the oil allowed to dry thus making a poor contact. This would make or break contact whenever the set was jarred. A good contact was made with a piece of wire.

On another set of this model the speaker had an annoying rattle which continued even after the voice coil was recentered. The seam in the speaker cone was causing the trouble. After cementing the seam the rattle disappeared.

### Model 20

When there is no plate voltage on either the first detector (51) or the second detector (27) remove the chassis end plate next to these tubes. Clip wires on the I.F. transformer connected in the circuit of the tube affected and remove the entire unit. Drill out the rivets around the lower edge of the shield.

Use a hot plate for the next step, place an old pan over the burner and put the I.F. transformer inside for a few moments to allow the tar to flow. Then the entire works can be pulled out. Examination will show a small condenser wrapped in paper next to the coil and in series with the plate winding and ground. This condenser will show a short. Replace with a .1 mfd. and the job is done.

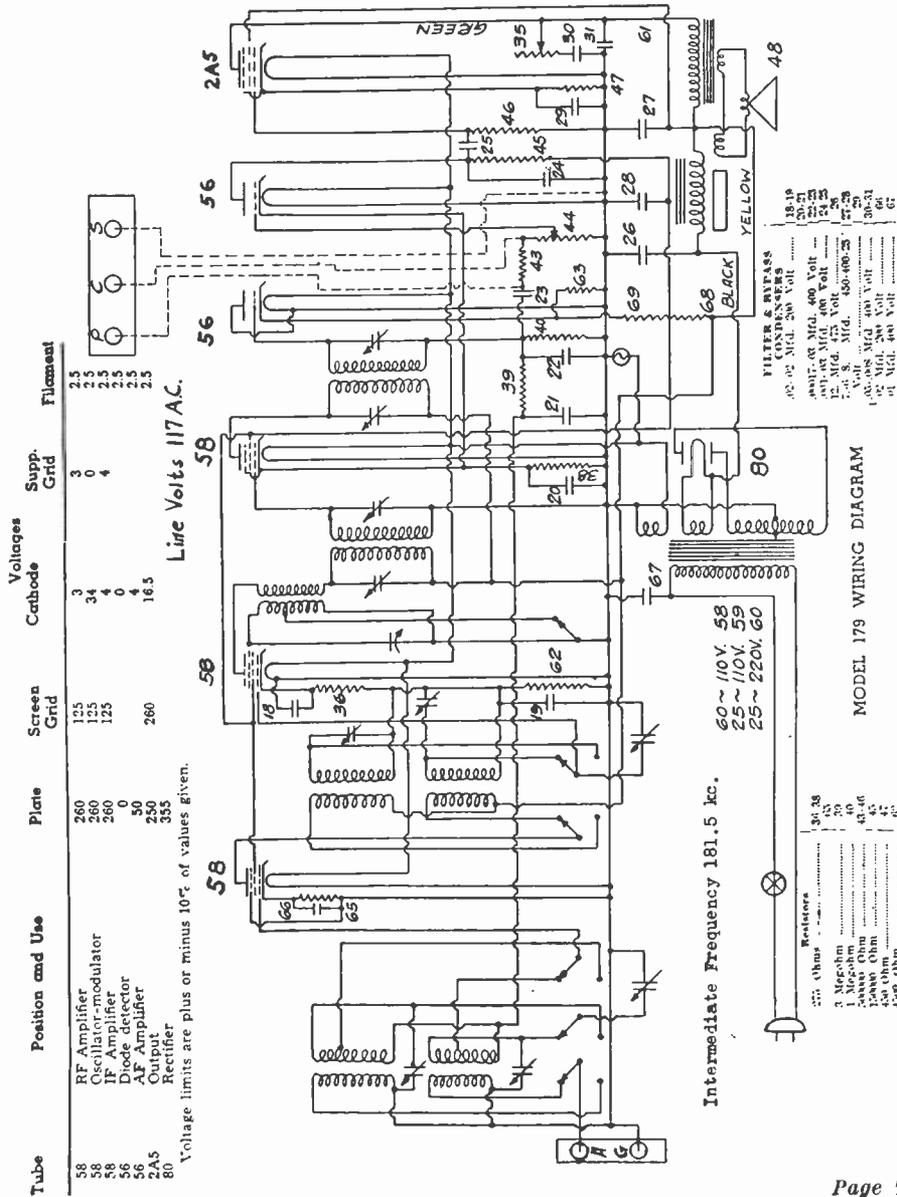
Peter Molisser, Fall River, Mass.

# RADIO-TRICIAN SERVICE SHEET

REQ. U.S. PAT. OFF.

COMPILED SOLELY FOR STUDENTS & GRADUATES

CROSLY MODEL 179



Tube	Position and Use	Plate	Screen Grid	Control Grid	Supp. Grid	Filament
58	RF Amplifier	260	125	3	3	2.5
58	Oscillator-modulator	260	125	0	0	2.5
58	IF Amplifier	260	125	4	4	2.5
56	Diode detector	0	0	4	4	2.5
56	AF Amplifier	50	260	4	4	2.5
2A5	Output	250	0	18.5	18.5	2.5
80	Rectifier	335	0	0	0	2.5

Line Volts 117 AC.

Voltage limits are plus or minus 10% of values given.

Intermediate Frequency 181.5 kc.

Resistor	Value
35	30-38
50	30
46	20
22	20
45	20
24	42-46
44	45
23	45
43	45
63	45
20	45
18	45
34	45
35	45
19	45
62	45
60	45
65	45
67	45
68	45
69	45
70	45
71	45
72	45
73	45
74	45
75	45
76	45
77	45
78	45
79	45
80	45

Intermediate Frequency 181.5 kc.

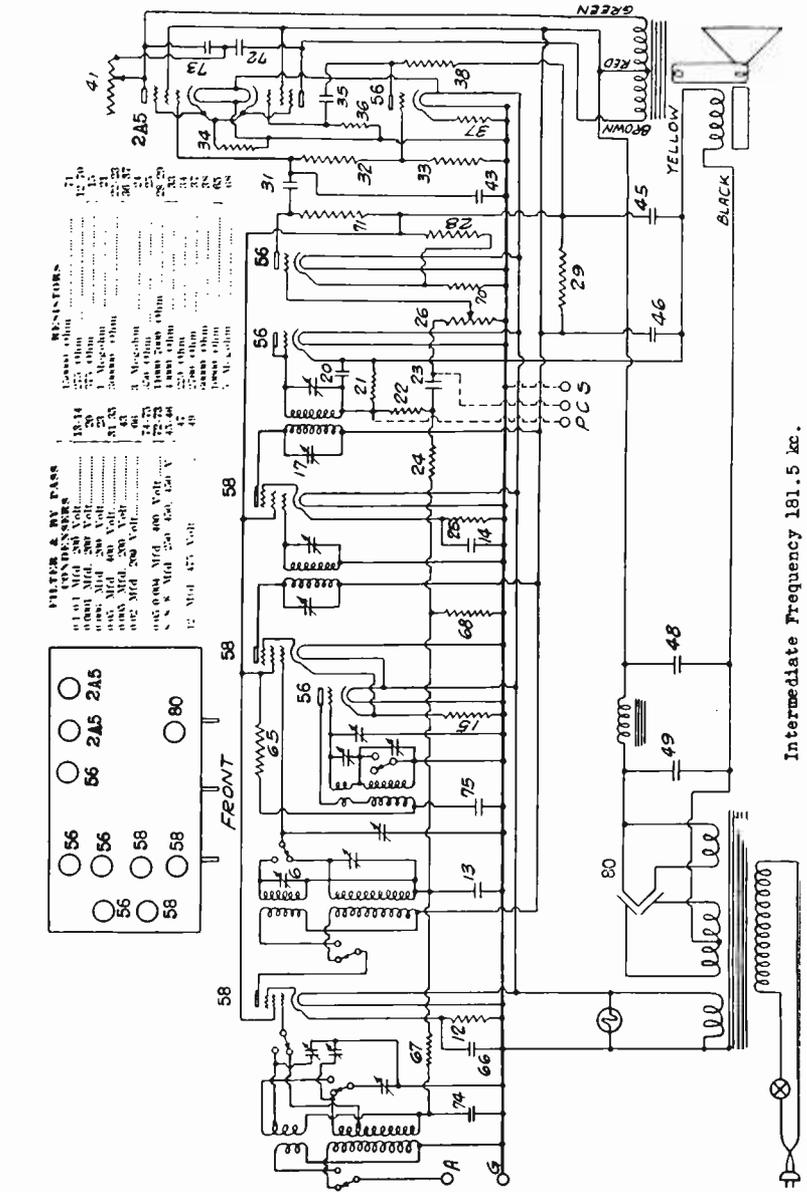
Filter & Bypass Capacitors

Capacitor	Value
25	18-19
26	20-21
28	22-23
67	24-25
68	26-27
69	28-29
70	30-31
71	32-33
72	34-35
73	36-37
74	38-39
75	40-41
76	42-43
77	44-45
78	46-47
79	48-49
80	50-51

MODEL 179 WIRING DIAGRAM

Readers who file Service Data in separate binders remove page carefully; trim on dotted line for same size as Data published heretofore.

# CROSLLEY MODEL 180



RESISTORS	
1000 Ohm	17
500 Ohm	18
250 Ohm	19
100 Ohm	20
50 Ohm	21
25 Ohm	22
10 Ohm	23
5 Ohm	24
2.5 Ohm	25
1 Ohm	26
500 Ohm	27
250 Ohm	28
100 Ohm	29
50 Ohm	30
25 Ohm	31
10 Ohm	32
5 Ohm	33
2.5 Ohm	34
1 Ohm	35
500 Ohm	36
250 Ohm	37
100 Ohm	38
50 Ohm	39
25 Ohm	40
10 Ohm	41
5 Ohm	42
2.5 Ohm	43
1 Ohm	44
500 Ohm	45
250 Ohm	46
100 Ohm	47
50 Ohm	48
25 Ohm	49
10 Ohm	50
5 Ohm	51
2.5 Ohm	52
1 Ohm	53
500 Ohm	54
250 Ohm	55
100 Ohm	56
50 Ohm	57
25 Ohm	58
10 Ohm	59
5 Ohm	60
2.5 Ohm	61
1 Ohm	62
500 Ohm	63
250 Ohm	64
100 Ohm	65
50 Ohm	66
25 Ohm	67
10 Ohm	68
5 Ohm	69
2.5 Ohm	70
1 Ohm	71
500 Ohm	72
250 Ohm	73
100 Ohm	74

FILTER & RY PASS	
1000 Ohm	18.34
500 Ohm	20
250 Ohm	21
100 Ohm	22
50 Ohm	23
25 Ohm	24
10 Ohm	25
5 Ohm	26
2.5 Ohm	27
1 Ohm	28
500 Ohm	29
250 Ohm	30
100 Ohm	31
50 Ohm	32
25 Ohm	33
10 Ohm	34
5 Ohm	35
2.5 Ohm	36
1 Ohm	37
500 Ohm	38
250 Ohm	39
100 Ohm	40
50 Ohm	41
25 Ohm	42
10 Ohm	43
5 Ohm	44
2.5 Ohm	45
1 Ohm	46
500 Ohm	47
250 Ohm	48
100 Ohm	49
50 Ohm	50
25 Ohm	51
10 Ohm	52
5 Ohm	53
2.5 Ohm	54
1 Ohm	55
500 Ohm	56
250 Ohm	57
100 Ohm	58
50 Ohm	59
25 Ohm	60
10 Ohm	61
5 Ohm	62
2.5 Ohm	63
1 Ohm	64
500 Ohm	65
250 Ohm	66
100 Ohm	67
50 Ohm	68
25 Ohm	69
10 Ohm	70
5 Ohm	71
2.5 Ohm	72
1 Ohm	73
500 Ohm	74
250 Ohm	75
100 Ohm	76
50 Ohm	77
25 Ohm	78
10 Ohm	79
5 Ohm	80
2.5 Ohm	81
1 Ohm	82
500 Ohm	83
250 Ohm	84
100 Ohm	85
50 Ohm	86
25 Ohm	87
10 Ohm	88
5 Ohm	89
2.5 Ohm	90
1 Ohm	91
500 Ohm	92
250 Ohm	93
100 Ohm	94
50 Ohm	95
25 Ohm	96
10 Ohm	97
5 Ohm	98
2.5 Ohm	99
1 Ohm	100

Intermediate Frequency 181.5 kc.

MODEL 180 WIRING DIAGRAM

Tube	Position and Use	Plate	Screen Grid	Voltages		Filament
				Carthode		
58	Modulator	270	112	5.5		2.5
58	RF Amplifier	270	112	3.5		2.5
56	Oscillator	50		5.5		2.5
58	IF Amplifier	270	112	3.7		2.5
56	Diode	0		0		2.5
56	AF Amplifier	50		3.0		2.5
56	Phase Inverter	50		3.0		2.5
Two 2A5	Output	260	270	175		2.5
80	Rectifier	360				4.3

All voltage limits are plus or minus 10% of values given. Line Voltage 117 A. C.

## PHILCO MODEL 16

### TUNING DRIVE SLIPPING

If the station selector shaft is not pushed all the way in or pulled all the way out when changing from the standard drive to the 60 to 1 ratio, the rubber drive wheels will not mesh correctly, and will soon wear to the extent of slipping. Customers should be carefully instructed on this point. When making a replacement of worn drives, the bracket which supports the drive assembly and which is riveted to the tuning condenser frame should be carefully examined. If this bracket is loose, the rubber drives will not mesh correctly and will wear in a short time. New drives will soon wear out in the same manner unless the bracket is tightened.

-----n r i-----

## OZARKA MODEL 90

### NO SIGNAL

This is generally due to a short in one of the R.F. bypass condensers. They should be disconnected one at a time and carefully checked.

-----n r i-----

## EMERSON MODEL 20A

### EXCESSIVE OSCILLATION

Remove the antenna wire coil from inside the cabinet. Even a small amount within the chassis will result in oscillation.

-----n r i-----

## CROSLEY MODEL 170

### 80 TUBE BURNS OUT

This trouble is due to a defective electrolytic filter condenser, part No. 29097. Replace the condenser with a new one.

-----n r i-----

## CROSLEY MODEL 168

### HISS

A back-ground hiss over the side dial is often due to defective tubes. Try new 2A6, 56 and 2A5 type tubes. Install a 400,000 to 100,000 ohm resistor across the primary of the first I.F. transformer. This will reduce the tendency to oscillate. Use the highest value possible which will reduce the hiss to an acceptable degree.

-----n r i-----

## CROSLEY MODEL 148

### DEAD OR WEAK SIGNAL

This is generally due to an increase in value of the wire wound resistor under the chassis, connected from the I.F. coil to the screen of the oscillator and to the cathode of the I.F. tube. The screen resistor should be replaced with one having a value of 8,500 ohms while the bleeder resistor should be replaced with one having a value of 25,000 ohms. Ten watt resistors should be employed to prevent any further trouble.

## CROSLEY MODEL 124

### FADING

This is usually due to a defect in one of the four .1 microfarad bypass condensers in the condenser block. You should replace one section at a time until the fading stops.

-----n r i-----

## APEX MODELS 8A & 10

### DISTORTION

If distortion occurs after the receiver has heated up well and the 47 grid becomes red check the 47 filament center tap. This usually becomes open. If the open is an intermittent one intermittent reception will occur. Intermittent reception in this set is also caused by an open .5 microfarad condenser connected between the R.F. cathode and the grid return of the R.F. and I.F. coils. A condenser rated at least 400 volts should be employed as a replacement.

-----n r i-----

## AIRLINE MODELS 62-97 & 62-99

### DEAD

This is often caused by a broken down .1 microfarad condenser in the plate circuit of the 58 type tube. A 400-volt replacement condenser should be employed.

-----n r i-----

## AIRLINE MODELS 40 & 40A

### WHISTLE NEAR 800 KILOCYCLES

The oscillator grid leak should be replaced with a 40,000 ohm resistor. A resistor lower than this will cause difficulty near 1,400 kilocycles while a higher value is the cause of the original trouble at 800 kilocycles. Sometimes it is worth while to try several tubes in the oscillator circuit before making the change.

-----n r i-----

## GENERAL ELECTRIC MODEL T-41

### EXCESSIVE PLATE CURRENT AND PLATE VOLTAGE ON POWER TUBES

This trouble is almost invariably due to a short between the filter choke and the chassis. Such a short cuts the filter choke and speaker field out of the circuit. The short occurs where the lead comes out of the case. This information also applies to the Radiola 48.

-----n r i-----

## PHILCO MODEL 80

### NO PLATE VOLTAGE

Remove the 80 tube, turn off the set and check with an ohmmeter between the filament of the 80 and chassis. A reading of about 1250 ohms indicates that a short in the B plus line past the speaker field has occurred. This is generally not caused by broken down condensers but by a short between the B plus lead of the detector oscillator and the chassis. The white wire

(Page 23, please)



# The OPPORTUNITIES in

By James G. Hollingsworth

**I**N the last few years a lot of development work has been done by competent engineers in the automobile Radio field. The ever-increasing demand for "entertainment as you ride" has been responsible for many thousands of dollars being spent in research to develop

auto receivers which can be neatly installed in any type of automobile, and are capable of getting approximately the same reception in the motor car as the midget set in the home.

Radio manufacturers have been emphasizing the importance of the auto Radio, stressing the neglect with which this branch of the Radio industry was being treated, particularly by dealers and independent service men. N. R. I. has also endeavored to show the importance of this field by quoting actual figures and we now do so again.

Refer to the chart, Figure 1, and you will see that in the year 1930 only 34,000 automobile Radio receivers were installed. In 1931, while a slight amount of pressure was put on the sale, the majority of the 108,000 persons who bought, did so through their own initiative, *without the effort of anyone else to sell them.*

By 1932 the automobile owner was beginning to see the advantages of having a Radio in his car, and in that year (still with only slight sales effort) 143,000 sales were made (a total of more than 1930 and 1931 combined), and this in a very bad depression year.

It remained for 1933 to bring about the first real dealer effort to push the sale of automobile Radio receivers, and consequently about 724,000 were sold (approximately twice the total amount sold in the previous three years).

But while some real effort has been made in the past year to put these sets on the market, the sales figure is very low compared with what it will be in the future. Quite true, a few dealers have been plugging the product hard, but the great majority of dealers have ignored the auto Radio business. Strange, too, because automobile owners have always been a fine market for various specialties.

Now just stop and consider what your real market is on automobile receivers. Only 2,000,000 will have been sold up to the end of 1934. Look at chart, Figure 2. Note what a big field still remains to be sold—21,000,000 cars still not equipped. And, of course, of the

2,000,000 which have been sold, thousands are becoming obsolete, adding a big replacement market to the 21,000,000.

There is but one answer. *The field of automobile Radio sales is still sadly neglected*—and consequently offers almost unlimited opportunity for dealers and independent Radio men.

Then, speaking of markets and opportunities, consider this. By referring again to Figure 1, you will see that 1,000,000 automobile receivers were sold up to the end of 1933.

1,000,000 are estimated for sale in 1934. This not only doubles the service market, but means that about five out of every hundred cars you see on the streets will be equipped in 1934.

Furthermore, every car equipped increases the demand for automobile Radio service and eventually becomes a prospect for another set as the original becomes obsolete. Your market goes on and on.

## WHAT DOES THIS MEAN TO YOU?

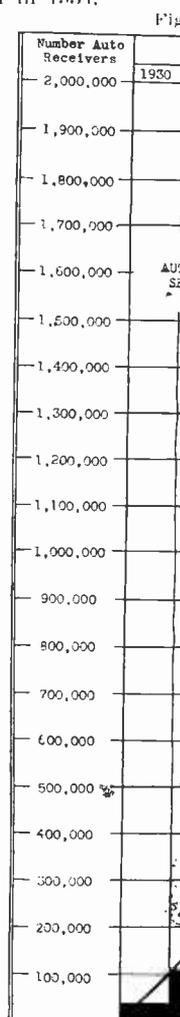
*It means opportunity!* The sales and service possibilities are unlimited, increased steadily by new cars being bought and by old auto Radio replacements. Many a wide-awake Radio-Trician is now devoting his time exclusively to this work and finds it highly profitable.

Read the quotation from a recent bulletin of the Hygrade Sylvania Corporation, New York City, large manufacturers of Radio tubes:

## AUTOMOBILE RADIO SALES TO EXCEED MILLION MARK IN 1934

"That the sale of automobile Radio sets will exceed the million mark by a comfortable margin during 1934, is the firm conviction of B. G. Erskine, President of the Hygrade Sylvania Corporation, the second largest Radio tube manufacturer in the world. Automobile Radio has firmly established its place in the field of modern Radio, states Mr. Erskine.

"A marked reduction in the price of automobile Radio sets together with the general acceptance of the idea of enjoying Radio programs while riding or



# the field of **AUTOMOBILE RADIO**

**E., N. R. I. Vocational Advisor**

parked, causing a terrific upswing of the sales to over 500,000 in 1933. I venture to state that we shall easily surpass the million mark in 1934, due not only to general public acceptance in popular price, but largely to the keen interest and cooperation displayed by the automobile industry in this added enjoyment to modern motorists."

What are you going to do to get your share of this business? Read what some progressive students and graduates of the National Radio Institute are doing to get their share. These are just a few of the many letters recently received:

## MADE ABOUT \$12,000 IN TWO YEARS

"I started in business and while taking the Course earned \$651, over six times the tuition fee. Since then I have devoted all my time to Radio servicing, repairing and selling all kinds of receivers and auto radios in my own shop. I have made approximately \$12,100 in the short period of two years. All my success I owe to N. R. I., the greatest institute in the world. I have found that the trained man wins." Signed, Ford R. Leary, 1633 Davison Road, Flint, Mich.

## AUTO RADIO BUILDS SUMMER BUSINESS

"With the increase in the use of auto Radios, my summer service business has been about as good as the fall and winter business. As Radio advances it becomes more and more of a necessity for the beginner to obtain a very thorough ground work in theory to properly service any of the present-day sets. I highly recommend the N. R. I. Course to either the beginner or the man who needs a more thorough theoretical background for his practice." Signed, Jacob G. Dubois, 90 Crescent, Poughkeepsie, New York.

## AUTO MECHANICS MUST HAVE THOROUGH TRAINING

"I have a garage for auto repair and another part for electrical and Radio sales and service. Here is where my N. R. I.

training comes to the front once more—by servicing auto Radios. You may be an auto mechanic, but you must have Radio training to service Radios. Thanks to N. R. I. I have this training. I cleared about \$550 in seven months on auto Radio sales and service alone, which I know I would not have made without my Radio training." Signed, E. W. Nederhouser, Route No. 1, Amsden, Ohio.

The installation and service of automobile Radio receivers is an art in itself, requiring thorough understanding of noise suppression and other problems peculiar to auto Radio receivers. It must not be thought, however, that a man can read just a few books on automobile Radio and become proficient in their installation and service. There is no short cut.

Just as a broadcasting station engineer must have a thorough working knowledge of the underlying principles of Radio before he can be proficient in handling transmitters, so must the automobile Radio man know the elements of Radio before he can satisfactorily service and install automobile Radios.

N. R. I. training furnishes a fine background for any specialized line of Radio work, such as automobile Radio. Furthermore, it thoroughly covers the subject of automobile Radio itself. With this thorough background of Radio knowledge and the special training given on automobile Radio problems, this subject becomes an "open book" to N. R. I. trained men. The N. R. I. man who is interested in this branch of Radio will find himself well prepared and the field profitable.



Figure 2



## IN TRAINING FOR YOUR SERVICE

IT has always been the policy of N.R.I. to have capable men and women on its staff to render the best possible service to students and graduates.

One reason for the capability of the staff is the Institute's method of training its personnel. It is only on rare occasions that the Institute goes outside its own ranks to obtain a person to fill an important position. In most cases such jobs are filled by persons who have seen long service with N.R.I., know its methods and are experienced in the problems of N.R.I. students and graduates.

The usual procedure for N.R.I. is to select a young man or woman, directly out of high school or college, train them to our methods. They advance from job to job; department to department. They are coached carefully—and finally placed in a department where they are best suited. From there they are promoted according to merit—until they are eventually in executive positions.

Of course, from time to time, it does become necessary to bring in older men with experience in particular fields which will be beneficial to students and graduates.

To give you a better idea of how our employee training plan works out, the staff photographer brings you a photo of six of the younger men of our organization. Some are comparatively new employees, others have already spent several years in our service and are on their way *up the ladder*.

Reading from left to right they are Wm. Higgins, Jack Van der Sys, Richard Hunt, Appeton Lawrence, Jr., John Wells, and Charles Lombardy.

Higgins has spent three years with N.R.I. He is twenty years old. In addition to what he is learning at N.R.I. he is also taking a course of business training at night school. He is at present in the Student Service Department.

Van der Sys is nineteen years old. He finished three years at Roosevelt High School (Washington, D. C.) and is now attending night school

at the Columbia School of Drafting. He has been with N.R.I. one year and is in the Student Service Department.

Hunt came with N.R.I. December 26, 1928. That means almost six years' experience in N.R.I. methods for him. He is twenty-four years old, and married. He is in the N.R.I. Stock Department.

Wells is twenty-two years old and married. A graduate of Alexandria (Va.) High School and a student of Broadcasting. He is in the Mailing Department and has been with N.R.I. six years.

Lawrence, who has been with N.R.I. three years, is twenty years old and a graduate of Washington and Lee High School (Cherrydale, Va.). He is in the Mailing Department.

Lombardy is nineteen years old. He attended Eastern High School (Washington, D. C.) for two years and completed his High School at night after coming with N.R.I. He has been with us four years and is in the Stock Department.

That this system is a good one is evidenced by the fact that N.R.I. is able to render such fine service to its students and graduates. One of its best features is that it is seldom necessary to discharge an employee trained by this method and consequently the service continues smoothly and efficiently.

N.R.I. employees usually have long periods of service. There are seven members of the staff whose service totals 121 years. There are many others on the staff with individual service up to 10 years.

This is a high standard for an organization just twenty years old.

The entire staff of N.R.I. is devoted to one main point and that is to help students and graduates become successful in Radio. And the most important element in that program is SERVICE. It is to maintain a high standard of service that N.R.I. places so much importance upon the proper training of its personnel.

# CROSLLEY MODEL 182

Tube	Position and Use	Plate	Screen Grid	Cathode	Supp. Grid	Filament
6A7	Oscillator	120		-8		6.5
78	Modulator	120	50	3		6.5
6B7	IF Amplifier	120	20	2.5	2.5	6.5
43	Diode and AF Amplifier	120	30	0	3	6.5
25Z5	Output Rectifier	115	120	0		25.1
				120		25.1

### FILTER & BY-PASS CONDENSERS

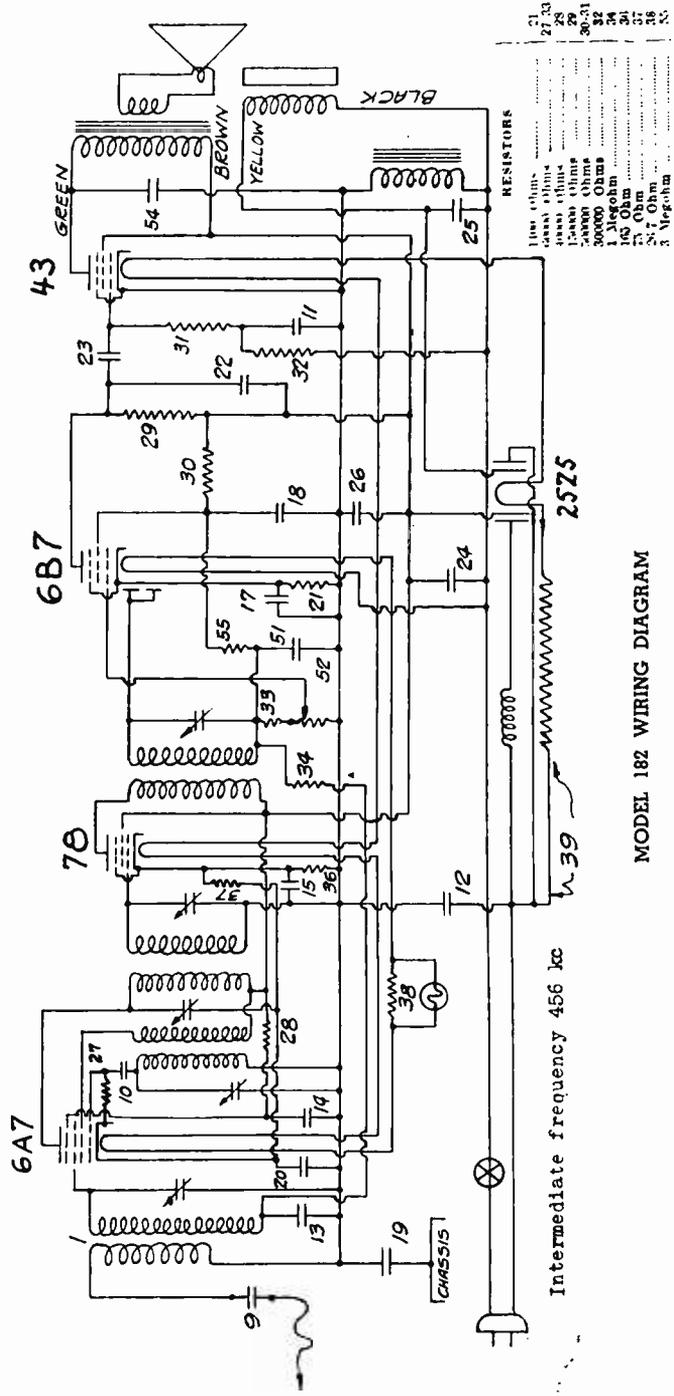
0.005 Mfd. 250 Volt	9
0.0005 Mfd. 400 Volt	10
0.25 Mfd. 300 Volt	11
0.02-0.02 Mfd. 400 Volt	12-13
0.02 Mfd. 200 Volt	14-15
0.1-0.1 Mfd. 200 Volt	18-19
0.0001 Mfd. 200 Volt	20
0.0001 Mfd. 200 Volt	21
0.0001 Mfd. 200 Volt	22
0.0001 Mfd. 200 Volt	23
0.02 Mfd. 200 Volt	24
6 Mfd. 25 Volt	25
25.8 Mfd. 125 Volt	17
25 Mfd. 110 Volt	26

Line voltage 117 A.C.

Voltage limits are plus or minus 15% of values given.

On DC operation, voltages are approximately 90% of those given above.

Output bias voltage is obtained by using drop across filter choke which is 20 volts.



### RESISTORS

1000 Ohms	21
1000 Ohms	27-33
1000 Ohms	28
1000 Ohms	29
1000 Ohms	30
1000 Ohms	31
1000 Ohms	32
1000 Ohms	33
1000 Ohms	34
1000 Ohms	35
1000 Ohms	36
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1000 Ohms	94
1000 Ohms	95
1000 Ohms	96
1000 Ohms	97
1000 Ohms	98
1000 Ohms	99
1000 Ohms	100

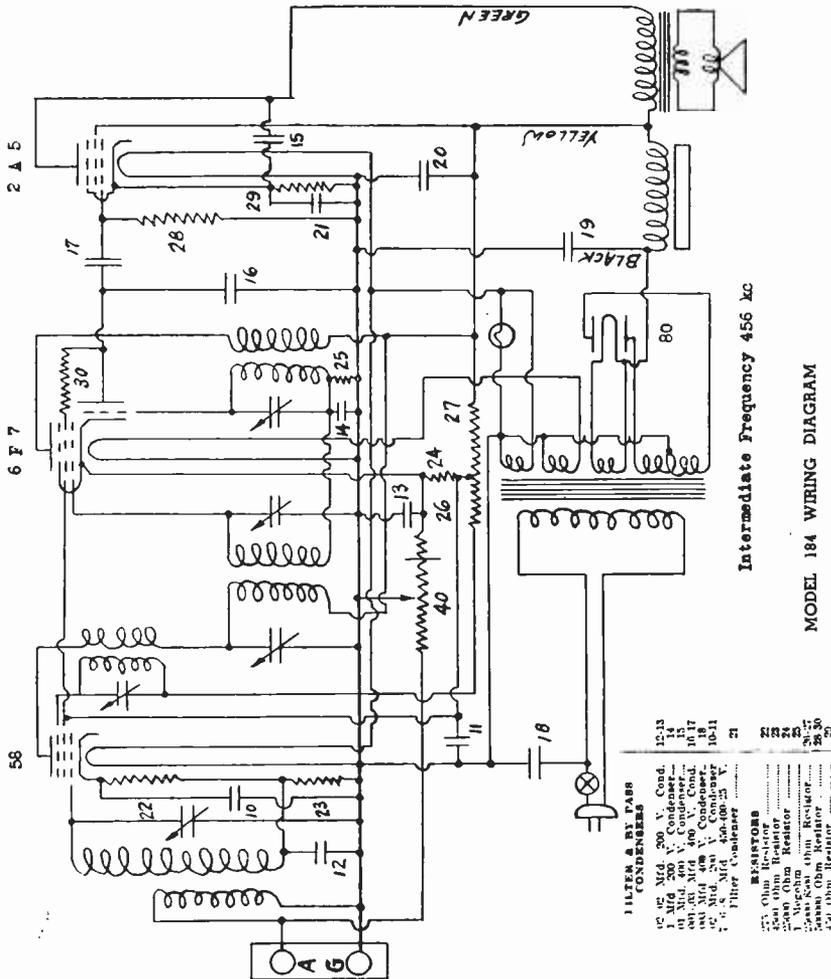
MODEL 182 WIRING DIAGRAM

# RADIO-TRICIAN SERVICE SHEET

REG. U. S. PAT. OFF. COMPILER SOLELY FOR STUDENTS & GRADUATES



## CROSLY MODEL 184



Tube	Position	Plate	Screen Grid	Cathode	Supp. Grid.	Filament
58	Oscillator-modulator	165	82	22	0	2.5
6F7	I. F. & Detector	165	82	2	0	2.5
2A5	Output	158	165	10		2.5
80	Rectifier	295				4.9

Voltage limits are plus or minus 10% of values given. Line Voltage 117 A. C.

Readers who file Service Data in separate binders remove page carefully; trim on dotted line for same size as Data published heretofore.

(Continued from page 12)

intensities, the area over which a given echo is heard, their relation to magnetic storms, sun-spots, etc.

The stations transmitting the special signals are GSB, Daventry, England, and HBL, Geneva, Switzerland (the League of Nations station). The GSB signals are transmitted on 9,510 kc/s, with a tone or modulation of 1,000 cycles per second, each Sunday, Tuesday, and Thursday, from 3:25 to 3:55 a.m., Eastern Standard Time. The HBL signals are transmitted on 6,675 kc/s, unmodulated continuous waves, each Sunday, Wednesday, and Friday, from 6 to 6:30 a.m., Eastern Standard Time.

Each transmission consists of a 5-minute adjusting period (GSB using phonographic music, and HBL using its call letters in morse code repeated) followed by the letters of the alphabet in Morse code, spaced a minute apart. Thus, for instance, GSB transmits the letter A in Morse code at 3:30, and after a minute of silence the letter B at 3:31, then the letter C at 3:32, etc., finishing with the letter Z at 3:55. During the 1-minute intervals between signals the observers listen for echoes and observe the elapsed time in seconds with a watch having a second hand. It should be noted that the GSB signals are receivable with a receiving set as used for broadcast programs but the HBL signals are unmodulated CW and therefore require an oscillating receiving set.

Dr. J. H. Dellinger, chief of the Radio section of the National Bureau of Standards, would be very glad to have any successful reception of long-delay echoes in the United States reported to him, and will relay the information to the British authorities who are coordinating the investigation for the world as a whole.

Observers should give the identifying letter of the signal observed, the time to the nearest second at which the direct signal was heard, the time to the nearest second at which the echo was heard, an estimate of the relative intensities of direct signal and echo, a description of the sharpness or apparent shape of the echo, and any pertinent information on interference, fading of signals, or other conditions of the observations.

Dr. Dellinger would be interested also in receiving reports on reception of long-delay echoes on any other stations, especially high-frequency stations in the United States. It may, on the other hand, be difficult to be certain of any echoes observed because of the lack of silent periods as in the special signals from the two European stations.

Twelve new Radio receivers, featuring standard and short-wave reception in every set plus "all-wave" and additional tuning-bands in eight of the models are included in the new 1934 Fall line of G-E Radios just announced by the General Electric Company at Bridgeport, Conn. In addition, 19 models previously announced, will be continued into the new season.

The new models—built around six new super-heterodyne chassis in five-, six-, eight-, ten-, and twelve-tube types and a seven-tube battery-operated type—include four table models, six consoles, and two automatic Radio-phonograph combinations.

All sets receive both broadcast and short-wave signals. Two are standard and short-wave models, the rest of the line being all-wave receivers covering at least 540—18,000 kilocycles, as defined by the Engineering Section of the Radio Manufacturers Association. Of course, three models have one additional band and three others have two additional bands over and above those required by the RMA all-wave definition.

Among the new features incorporated in the new multi-band models are three improvements designed to lend added ease and simplicity to the tuning of the shorter wavelength bands. These are:

(1) Dual-ratio tuning, by means of which the tuning knob, when pulled out slightly, provides a change in ratio from 10:1 to 50:1 and thus affords convenient vernier tuning.

(2) Band indicators, by means of which a letter, such as "A", "B", or "C", appears in an aperture at the bottom of the new square-shaped airplane type dials in order to indicate which band is being tuned.

(3) "Stop-watch" band-spread dials, by means of which an auxiliary pointer—very much like the sweep-second hand of an electric clock—"spreads" the short-wave bands through a much larger arc than that covered by the customary pointer and thus makes possible the accurate recording of dial settings for many short-wave stations, the logging of which would otherwise be practically impossible.

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## CROSLEY MODEL 170

## INTERMITTENT RECEPTION

The 8 microfarad condenser connected across the 25,000 ohm bleeder resistor is usually the cause of the trouble. For a permanent repair job it is best to replace all three of these condensers with a new one. These condensers may be easily checked by substituting a single section new condenser one at a time for the old ones until the trouble disappears.

# This Fall and Winter

FALL and winter have always been the very best seasons for the Radio Service Man. Another summer has passed and we are now coming into another *big season*.

This year, however, the opportunities for earnings in Radio Service are greatly increased. There are bigger earning opportunities for you than there have been for several years, for a number of very definite reasons.

In the last few years, business conditions have been very poor. At this time of the year, which is normally the beginning of the best Radio season, people had the fear of a hard winter ahead, and with the decreased earning power of most everyone, folks looked ahead to winter as a season of hardship. They consequently hoarded their money against possible worse times which they expected the *depression winters* to bring. They laid away, for the winter's *rainy day*, money that they would otherwise have spent.

In consequence, even though the good Radio season was at hand, there was comparatively little money spent in reconditioning Radios for the good Radio season ahead.

But this year it is all different. Times are definitely better. Millions of people have gone back to work and have assured occupation for the coming winter.

The colder weather will drive them indoors, so to speak, get them away from outdoor activities, make them more conscious of the entertainment to be derived from their Radios.

And, after several years of close economy, forced upon them by the depression, they are *entertainment hungry*. They will go to extremes to give themselves the entertainment of which they have been deprived during the hard years just past.

Furthermore, there are many Radios which have been idle, or operating improperly for a long time, a condition which we might call a *hoarding of service work*. It can be compared to a river which has had a dam built across it, causing a lake, or reservoir to back up behind it. This dam was hard times and lack of money. It will be destroyed this fall and winter by the points mentioned above, and as a consequence there will be a flood of Radio Servicing released to the Radio Service Man.

All of which indicates that there is plenty of Radio Service work to be had. But, this does not mean that you are going to get your share, unless you go after it. Some of this work must be coaxed out of hiding.

Now is the time to go after all of your old customers. Show them that the time is at hand to start enjoying their Radios again. That the time has passed when they cannot afford to have their Radios in good operating condition.

Show them that the Radio programs of this coming season will be the best we have ever

enjoyed. This is because the big Radio advertisers have seen the same buying trend and have, as a consequence, increased their effort to draw in more business for themselves by putting bigger and better programs on the air.

While you are going after these old customers of yours strive to make new customers. This can be done by questioning each of the old customers as to friends of theirs who have Radios in need of repairs, to whom they can refer you. Ask questions about their neighbors—pick up leads wherever you can, and go after these leads as soon as possible, before someone else beats you to the job.

This fall and winter should be very busy days for you. You will have to get around quite a bit. You'll have to work long hours—because there will be lots for you to do. But above all, you must make up your mind that you really want this business and be willing to go after it. Wherever there is a Radio set there is a potential market for your services.

Don't be afraid to ring doorbells—don't be afraid to make telephone calls. If the wife, at home, does not want to take the responsibility of having the set fixed, get the husband on the phone at his office. Or make an appointment to see him at night after he returns from the office. **BUT GET THAT JOB.**

And when your business picks up, as it will if you really go after it, don't be satisfied if you are merely making more money than you have in the past. Don't let it go at that. Remember that this is a boom period for the Radio Service Man and it is up to you to *get as much work as you possibly can while this boom is on.*

But while you are handling this large amount of work, remember this. You are not just handling these customers once, then letting them go elsewhere for their Radio Service in the future. Not on your life! You are building up your service business, and all of the old customers, as well as the new ones you make must be satisfied with your work so that they will call on you again when they are in need of service.

Therefore, while it is up to you to get and handle as much service work as possible, it is also your duty to yourself and to the Radio Industry to do a good job in each place and leave a satisfied customer, one who will call on you again, and who will have no hesitancy in recommending you to his friends who may also become your customers.

Work must be your watchword this fall and winter. Work as you never did before. You'll be surprised how much work you can handle when you really get into it and get yourself and your time organized for a volume of business. And if you will follow out these suggestions, just watch your bank balance grow—watch what a difference there will be in it by the time next spring rolls around.

## Service Forum

(Continued from page 15)

which goes into the left-hand coil with the chassis turned up side down and facing the rear sometimes short to the chassis. A piece of spaghetti slipped over the wire will clear up the trouble.

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### CROSLEY UTAH INABILITY TO ALIGN SPEAKERS VOICE COIL

Note when the center aligning screw is adjusted tightly whether the spider can be slipped from side to side. If such is the case remove the center screw and cut out a small cardboard washer, placing it under the spider. Then re-install the screw, tighten up and align. The trouble is due to the fact that the screw will not hold the spider firmly against the pole piece without the washer.

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### PHILCO OSCILLATIONS MODEL 96

This can be cleared up by connecting a .25 microfarad condenser from one of the 24 type filament leads to the chassis.

A double .25 microfarad condenser, Philco part No. 3557, should be installed for best results, connecting the two lugs to opposite sides of the filament leads. A hole at the rear of the chassis will be found suitable for mounting this condenser. The hole is made near the large condenser in the tin case mounted at the rear of the chassis.

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### PHILCO NO RECEPTION ON MODEL 18 SHORT-WAVE

Check the contact blades of the range switch. They sometimes lose their tension and do not make proper contact. You can easily bend the blade to obtain the proper tension.

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### MAJESTIC MODEL 25 HUM

If the trouble is not due to an open filter condenser, check the pilot lamp bracket, making sure that it is not shorted to the chassis, as this would prevent any bias from being applied to the power tubes.

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### GENERAL ELECTRIC FUSES BLOW MODEL B-40

This is most often caused by shorted .03 microfarad condensers located at the vibrator base.

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### BOSCH DEAD MODEL 28 & 29 NORMAL VOLTAGES

Check the rubber covered wire from the antenna variometer to the volume control. This wire sometimes shorts to the chassis when pass-

(Page 25, please)

## Sylvania Announces 12A7 Type

THE Sylvania 12A7 type—a combination power pentode and rectifier tube designed especially for use in small AC-DC receivers where space is at a premium—is announced by the Hygrade Sylvania Corporation of Emporium, Pa. There is a 6.3 volt heater for each unit, the heaters being connected in series internally, thus making the rated heater 12.6 volts. Separate connections are brought out for the pentode-cathode, screen grid, and plate. The suppressor grid of the pentode section is connected internally to the pentode-cathode. The rated power output from the pentode is 0.55 watt, and the maximum DC load current of the rectifier section is 30 milliamperes.

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## McMurdo-Silver, Inc., Offers Dealerships

NATIONAL RADIO NEWS has received from McMurdo-Silver, Inc., 3354 North Paulina St., Chicago, Illinois, an offer which may be of interest to you.

This company, manufacturing a fine grade of custom built receivers, wishes to appoint N. R. I. students and graduates, who are actively engaged in the service business, as dealers for this line. Regular *dealer discounts* are offered.

If you are interested, write to Mr. Loyd E. Back, McMurdo-Silver, Inc., 3354 North Paulina St., Chicago.

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## Graduate Seely Says

I am jotting down a few more Service Hints which may help some of our readers.

Brunswick S31 also Bremmer Tulley S81

Distortion was caused by 1½ meg purple resistor located between grid and ground of 1st A. F. This resistor measured O. K. but had to be replaced to get proper results.

Lyric 90

Weak and distorted reception all voltages checked O. K. Short circuit between plates of the two 45's although Center Tap to Plate of each tube showed resistance. Had to replace output transformer.

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## Emerson Model T-S

Oscillation on all wave lengths is caused by coupling between the red wire located between speaker and tuning condensers. Bending the wire toward the speaker will clear up the trouble. If insufficient sensitivity is experienced, the red wire may be bent toward the condensers.

Page Twenty-three

# N. R. I. ALUMNI News



T. J. Telaak

## Hats in the Ring

The time has come for us to think about selecting the officers for another year for the Alumni Association. This election is for National Officers and does not have any bearing on Local Chapter Officers, although several of the Local Chapters will elect officers on the first of the year.

From the letters we receive here at National Headquarters it is not hard

to see the trend of feeling, that is, to know what the fellows are thinking. For instance, in this election to which we are now coming, there is a strong feeling in favor of Ted Telaak, the present President of the National Association (also Chairman of the Buffalo Local Chapter). Ted has done some fine work. The boys in and around Buffalo are backing him 100%. Ted is a real old-timer in the Radio business, a good organization man and one who knows how to get along with people and make them like him.

He is the kind of fellow you can expect to poll a large vote in this or any other election and he is going to be a hard fellow to beat out.

On the other hand, down in Baltimore there is another fellow who has stated definitely that his hat is in the ring for the job as President of the N. R. I. Alumni Association. He is P. J. Dunn, Chairman of the Baltimore, Md., Chapter of the Association. Pete has a real honest-to-goodness following, too, in Maryland, and throughout the South. The boys of the Baltimore Local are backing their choice strong and predict a tight race.

All we can say is this. We know both of these men personally. They are both fine fellows, heart and soul for the Association and for N. R. I. It should be a good race and may the best man win.



P. J. Dunn

## Nominations

There are seven offices of the Alumni Association to be filled—President, four Vice-Presidents, Secretary, and Executive Secretary. It is due time to give serious consideration to the nomination of candidates for the 1935 election.

The officers who served during the year 1934 are as follows:

President, T. J. Telaak, Buffalo, N. Y.  
 Vice Pres., L. J. Vaneek, Cincinnati, O.  
 Vice Pres., F. A. Nichols, Denver, Colo.  
 Vice Pres., F. A. Parkins, Oglethorpe University, Ga.  
 Vice Pres., T. A. Deschantz, Pittsburgh, Pa.  
 Secretary, E. A. Merryman, Washington, D. C.  
 Executive Secretary, P. J. Murray, Washington, D. C.

On page 29 of this issue of NATIONAL RADIO NEWS, a NOMINATION BALLOT FORM has been provided. It is arranged so you can remove it without injuring the magazine. Just tear it carefully on the dotted line.

It is your privilege to nominate two men of your choice for each office of the Association. You may nominate men who served as officers last year, or you can select others—just as long as they are Alumni Association Members in good standing. You may nominate yourself, if you desire.

When you have filled out and signed the blank it should be returned promptly to National Headquarters. The two men who have the highest number of votes for each of the offices will be selected as candidates, and in the next issue of THE NEWS you will be given the opportunity of making a final selection of the officers who are to serve during the coming year.

There is a lot of detail work connected with this selection so it is requested that each and every member send his ballot in to National Headquarters just as soon as possible.

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All Alumni Association Members in or around cities where there are Local Chapters should be active members in such Locals. They are located in Buffalo, Cleveland, Pittsburgh, Chicago, Detroit, Baltimore, Toronto, New York-Brooklyn, and Philadelphia-Camden. Addresses are given elsewhere in this issue.

## Toronto Local "First in Canada"

Greetings from Canada to all our Alumni Association members and readers of NATIONAL RADIO NEWS. We are proud to be the first Canadian city with a Local Chapter of the N.R.I. Alumni Association.

Let us tell you a bit about our first meeting. It was held in the clubroom of the beautiful Royal York Hotel in Toronto and was presided over by our genial Executive Secretary, P. J. Murray, who travelled all the way from Washington to tell us what it was all about. He very quickly satisfied us that it was to our best interests to get busy and form a Local.

After "P. J." had answered a lot of questions in reference to the Association and its operation of Local Chapters, it was decided to obtain a Charter immediately, and on the matter being put to a vote the "Ayes" had it and the Charter was rapidly subscribed.

There were present, at this meeting, forty-two graduates and students. Four of the members were from out of town and these four had to travel an aggregate distance of 478 miles. How is this for loyalty? We are sure the Association will deeply appreciate the *esprit de corps* shown by the Canadian members in the Toronto area.

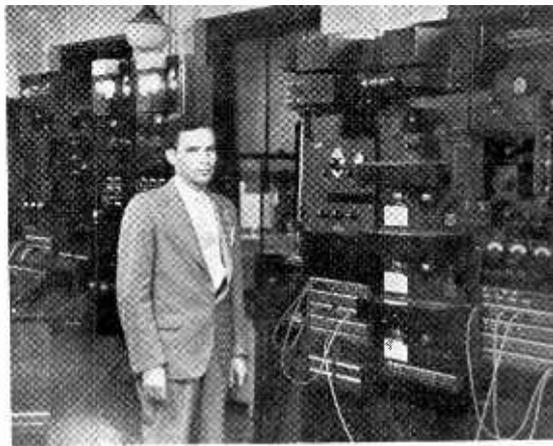
Temporary officers were appointed to serve for two months after which a general election of permanent officers will be held. Those appointed were: Mr. Willis Forward, Acting Chairman, 8 Bracondale Hill Road, Toronto. (Phone ME 5110), and A. G. Ruse, Acting Secretary-Treasurer, 449 Roehampton Ave., Toronto. (Phone MO 3461).

Our Charter will remain open for a while to give other members a chance to get in as Charter Members. A phone call or letter to either of the above officers will obtain for you full information.

ARTHUR G. RUSE,  
Acting Secretary.



A partial view of the Beautiful Royal York Hotel in Toronto where the first meeting of the Toronto Local Chapter was held.



Very seldom do we see a new photograph of our old friend, Earl Merryman, Secretary of the Alumni Association. Earl is ordinarily a bit camera-shy.

However, we've got a new picture of Earl; who is one of the oldest officers of the Alumni Association, having been elected in 1929 to the Secretary's job and re-elected every year since. Here he is at the control apparatus of Radio Station WJSV.

Earl recently made a trip to Cuba for the Columbia Broadcasting System, returning on one of the United States Navy airplane carriers, from which he and an associate broadcast the review of the United States Fleet.

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### Service Forum

(Continued from page 23)

ing through the drilled holes, thus preventing any signal from being applied to the input of the set. A new wire will clear up the trouble.

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#### ATWATER KENT MODEL 40 & 42

#### EXCESSIVE HUM

This is often due to open filter condensers. The open occurs under the resistance strip at one of the lugs coming up from the bottom of the power pack. The wire coming up from the sealing compound and connected to one of the lugs is the ground lead from the condensers. If this circuit is open a hum will be heard. After repairing this the connections on the terminal board should be tightened up with a pair of pliers and a screw driver.

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#### SPARTON MODEL 99

#### DEAD—81 RECTIFIER BECOMES RED HOT

This is usually due to a short between the rubber covered leads passing through the open-

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## Baltimore Local

*"Watch Us Grow"*

After a summer which has been devoted to building up our organization and making plans for the future the Baltimore Local is ready to step out with its first big plan.

Within the next few weeks it is expected that we will move into our new, full-time quarters, which means that instead of having meetings only twice a month, we will have a place where members can meet as often as they please—but still maintaining our regular business meetings, of course, twice a month.

In our new location, we will set up a completely equipped Radio shop and will advertise for service work which will be issued out to our members who are nearest to the place from which the call is received. Members who do not have fully equipped shops will have the opportunity of bringing their jobs into the Local Headquarters and doing them there—and it is planned to have at least two of our members in the shop at all times to take care of tough jobs and test jobs, for our members.

This is only one of the many services we intend rendering the Alumni Association Members in Baltimore and the vicinity.

Now here is a message we want to get across to all Alumni Association Members in Maryland and the District of Columbia. Until circumstances and conditions warrant the opening of additional Alumni Association Chapters in this section, the Baltimore Local desires to extend an invitation to students and graduates of the Institute who live in this vicinity to affiliate themselves with the Baltimore Local and attend the very instructive and interesting meetings which are held twice a month in Baltimore.

Students and graduates in Washington, D. C., the northern part of Prince George's County, the eastern sections of Montgomery and Howard Counties, northern Anne Arundel County, the southern sections of Baltimore and Harford Counties are easily accessible to Baltimore. It is not a long ride and the roads are good. Come in for the meetings and get acquainted with what the boys in Baltimore are doing.

Meetings are held the first and third Tuesdays of every month, ordinarily, and while we are not now in a position to state just where the next meeting will be held (due to the fact that we are negotiating for our new home), if you will drop a line to Mr. George Ruehl, Jr., Secretary-Treasurer, N. R. I. A. A., Baltimore Local, Charleston and Second Aves., Lansdowne, Md., he will inform you of all the details of the next meeting just as soon as they are available.

To give you an idea of the interesting features you may expect at the meetings of the

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Page Twenty-six

## Buffalo

*"The Pioneer Local"*

At our regular meeting on August 13 we sort of set aside our regular order of business. It was a rather auspicious occasion and given more to entertainment than to business.

We were entertaining our Executive-Secretary, Mr. P. J. Murray, of Washington, D. C., who was paying his first visit to the Buffalo Local since January 1933.

Mr. Murray gave a short talk, stated that he was particularly pleased with the progress which has been made by "The Pioneer Local" of the Alumni Association—that he was glad to see so many of the same fellows who were present at the first meeting when the Local Chapter was opened; also glad to see so many new members who are following along and deriving the benefits of the Local Chapter.

Refreshments were served from our own bar—we had plenty of music—and the members devoted the balance of the evening (and some of the next morning) to telling yarns, playing pool, singing and discussing among themselves some of the Radio problems of the day.

In his talk Mr. Murray outlined some of the plans for the Alumni Association for the coming fall and winter and we are very glad to cooperate in every way we can to further these plans.

By cooperation of all the Local Chapters with National Headquarters we feel sure that our Association will be the best Radio organization in the country.

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## New York-Brooklyn

*"Tops Them All"*

We're still holding our meetings in the Hotel New Yorker and like our meeting place very much. It is very impressive—the fellows like to attend meetings in such nice surroundings.

We recently got up a very attractive piece of literature telling about the aims of the New York-Brooklyn Local—and plans for future meetings, etc. The literature also told about the speaker at the last meeting and his topic.

We were sorry indeed that due to illness Mr. Vonderheide, of the Baltimore Local, who was to visit us in New York could not be here. But we understand Mr. Vonderheide is well now and will soon pay us that visit. We're looking forward to meeting him—we're going to show him what makes the wheels turn around in the Local Chapter in the "Big Town."

As one part of our plan to cooperate with National Headquarters in the big fall campaign is to extend invitations to all N. R. I. students to attend the meetings of the New York-Brooklyn

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## Detroit

The Acting Chairmanship of the Detroit Local is now held by Mr. C. H. Mills as a result of the retirement from active duty of Mr. F. X. Schachtner, who has been Chairman of that Local since it was organized.

Mr. William R. Sewell now holds the position of Acting Secretary.

A new committee, consisting of Mr. William Webster, Mr. H. C. Jackson and Mr. Kenneth Swain has been appointed, to be known as the "Entertainment Committee," to arrange social activities for the Local.

Mr. Charles Colquitt has been elected to the Finance Committee to replace Mr. Robert Eiders who has found it unable to attend meetings, as his position requires his attendance during the evening.

Seven new members have recently been added to the rolls of the Detroit Local, which now has forty-six active members—and is growing.

At the last meeting a very interesting talk was given by Mr. F. E. Oliver, discussing trouble shooting in automobile Radio. The entire membership was then drawn into a general discussion on the subject of automobile Radio and everyone derived a lot of benefit from it. A card party has been arranged for the members of the Detroit Local, their wives and friends, to be held at the home of our Librarian.

With fall and winter coming on the aim of the Detroit Local is to go forward with rapid strides to reach a new high level of organization and activity. Being thoroughly in accord with the building up plans at National Headquarters the Detroit Local will cooperate to the best of its ability.

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## Baltimore

(Continued from page 26)

Baltimore Local—we have recently heard Mr. Joseph Kaufman, Educational Supervisor of N. R. I., speak on the "Art and Science of Radio Service," also on the subject of "Television." Mr. J. B. Straughn, Servicing Consultant of N. R. I., conducted a Radio Service Forum. Mr. H. K. Bradford, of the Capitol Radio Research Laboratories, will speak at the next meeting on the subject of "Automatic Volume Control." There's something good at every meeting. N. R. I. *students* are also welcome.

—————n r i—————

A last-minute note comes from Baltimore which says Mr. Bradford's talk on "Automatic Volume Control" was "great stuff." Maybe we'll get him to write it up for NATIONAL RADIO NEWS.

## Addresses of Local Chapters

We have been receiving quite a number of inquiries from students and graduates of the Institute regarding the addresses of the various Local Chapters of the N. R. I. Alumni Association.

For your convenience we are listing below the addresses where you can obtain full information regarding Local Chapter memberships:

BALTIMORE—George Ruehl, Jr., Secretary-Treasurer, Charleston and Second Avenues, Lansdowne, Maryland.

BUFFALO—T. J. Telaak, Chairman, 657 Broadway, Buffalo, New York.

CHICAGO—Samuel Juricek, Secretary, 4223 North Oakley Avenue, Chicago, Illinois.

CLEVELAND—J. C. Hamnum, Secretary, 19400 Shoreland Avenue, Rocky River, Ohio.

DETROIT—C. H. Mills, Acting Chairman, 5458 Fifteenth Street, Detroit, Michigan.

NEW YORK-BROOKLYN—Allen Arndt, Membership Secretary, 68 Suffolk Street, New York City.

PHILADELPHIA-CAMDEN—Clarence Stokes, Acting Secretary, 2728 Kensington Avenue, Philadelphia, Pennsylvania.

PITTSBURGH—Albert Maas, Secretary, 9 South Howard Avenue, Bellevue, Pennsylvania.

TORONTO—Arthur G. Ruse, Acting Secretary-Treasurer, 449 Rochampton Avenue, Toronto, Ontario, Canada.

—————n r i—————

## Philadelphia-Camden

A special notice has been printed and mailed to all N. R. I. graduates in this section inviting them to become members of the Association and of the Local. This is part of our cooperative plan to work with National Headquarters on their fall and winter campaign to build up the membership and service of our Association.

Four new Local Chapter members were admitted to the Philadelphia-Camden Local at the last meeting and it was decided to obtain for our Library and consequently for the use of our members Radio manuals from all manufacturers. The matter was again brought up of each of our members interviewing personally a graduate in this territory to induce him to become a Local Chapter member.

The topic of discussion at the last meeting was "Hum Elimination" which was favorably received by our members.

Plans are under way to try to have as a guest speaker at one of our forthcoming meetings, some member of the Staff of the National Radio Institute. We'll tell more about this later. We want to extend a cordial invitation to

(Page 28, please)

Page Twenty-seven

## Pittsburgh

The Pittsburgh Local was very glad to have the opportunity recently to render a service to an Alumni Association member located way out in Nevada.

This member was in the market for some portable talking moving picture equipment and referred his request to National Headquarters. National knowing that there were some talking picture men in the Pittsburgh Local immediately referred the request to this Chapter. We are glad to say that the matter was handled promptly and the Alumni Association member has our recommendation in his hands by now. We trust that we helped him. It is our desire to be of assistance to Alumni Association members wherever they may be.

The Pittsburgh Local Chapter is indeed glad to hear of the plans outlined by National Headquarters for our big fall and winter campaign. We will cooperate to the very best of our ability. We are starting out by extending an invitation to every student and graduate in the Pittsburgh territory to begin at once attending our meetings. Drop a card to our secretary, Mr. Albert Maas, 9 S. Howard Avenue, Bellevue, Pa., for full information.

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## Philadelphia-Camden

(Continued from page 27)

every N. R. I. student and graduate in the Philadelphia-Camden area to attend our meetings. Just drop a card to Mr. Clarence Stokes, Acting Secretary, 2728 Kensington Avenue, Philadelphia, Pa., for full details regarding the time and place of the next meeting.

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## New York-Brooklyn

(Continued from page 20)

Chapter. These meetings are held the third Thursday of each month in the North Ballroom of the Hotel New Yorker, 34th St. and 8th Ave., New York City. Come down to the meeting—get acquainted—you'll be welcome.

The New York-Brooklyn Chapter has created what is known as a "Good and Welfare Committee" the duty of which it will be to take care of the social and recreational activities of our organization.

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When a Philco Model 89 or 19 gives trouble with intermittent reception and shifted dial readings, check the screws holding the stator plates of the tuning condensers. If loose, tighten them up. Loose screws in the oscillator condenser stator generally is the cause of a shift in dial reading, as it results in a shift of oscillator frequency.

Page Twenty-eight

## Ohmmeters

(Continued from page 6)

ohmmeter scale. Here we solve for  $D_2$  as shown below:

$$D_2 = D_1 \div \left\{ \begin{array}{l} R_K \\ - + 1 \\ R_m \end{array} \right\}$$

Let us say we do not have the ohmmeter scale marked out in Fig. 1, or that we wish to check this scale to see that it is marked out correctly when it is known that the meter resistance is 35 ohms. Let us check the reading on the 125 volt scale for reading of 5 ohms. In this case,  $R_K$  is 5 ohms,  $R_m$  is 35 ohms and  $D_1$  is 125. Here we divide 5 by 35 and obtain .143. When we add one to this we get 1.143. When we divide 125 by 1.143 we get approximately 109 for the value of  $D_2$ . You will notice that this checks with the marking on the 125 volt scale.

In a similar manner we can check each of the seventy markings on the ohmmeter scale and in this way supply a scale which is suitable for any meter resistance which is chosen.

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## Service Forum

(Continued from page 25)

ing in the bottom of the power unit. New leads or spaghetti over the old ones will clear up the trouble.

---

## PHILCO MODEL 5 & 6

Check the 20 microfarad cathode by-pass condenser in the power tube circuit. If defective, the power condenser block in which it is located will have to be replaced due to the lack of space.

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## RCA VICTOR MODEL R-73, R-75

This is generally caused by defective .05 microfarad condensers by-passing the R. F., first detector and I. F. secondary return circuits. Try new condensers of the proper capacity.

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## RCA VICTOR MODEL R-28

This condition can generally be remedied by replacing the 2A7 detector oscillator tube. Even if the tube checks O. K. in a tube checker, try a new one.

## WEAK SIGNALS

## INTERMITTENT RECEPTION

## INTERMITTENT AND NOISY

## Cleveland

At our last meeting we had the pleasure of hearing Mr. C. H. Shipman in a discussion of "Automatic Volume Control."

Our next meeting will bring up the discussion "Set Testers and Their Use."

One new member was admitted to the Cleveland Local at the last meeting.

The Cleveland Local is picking up speed after a number of serious reverses. National Headquarters has promised to cooperate with us and a big drive will soon be on to build up the Cleveland Local to the position it should really hold among the Alumni Association Chapters.

Cleveland will also cooperate in the fall and winter campaign which will be launched by National Headquarters. We fully expect that this campaign will be a big factor in putting the Cleveland Local well on its feet—really doing things.

We were mighty glad to hear about this bigger, better NATIONAL RADIO NEWS which we are now receiving. We know this will go a long way toward creating and maintaining interest in the Association. It is just one of the many additional services proposed by National Headquarters in their plan to build a bigger, better organization.

All N. R. I. students in this locality are cordially invited to attend the meeting of the Cleveland Local. Just drop a line—a postcard will do—to J. C. Hannum, Secretary, 19400 Shoreland Avenue, Rocky River, Ohio—for information regarding the time, place and date of the next meeting.

— n r i —

## General Service Hints

(Continued from page 8)

and in most cases just touching the leads across the condenser will remove the short.

The repaired condenser should then be checked for a short by your own favorite method and, if you are satisfied as to the removal of the short, tried out in the set. Be ready however to shut the set off immediately if the condenser should break down again under the high power pack voltage. Watch the rectifier tube for a blue glow indicative of excessive current through it caused by a new breakdown in the condenser. If the condenser seems to work O.K. after starting and stopping the set several times it will be a safe temporary replacement.

## Nomination Ballot

All Alumni Association Members are requested to fill in this Ballot and return it, immediately, to National Headquarters. It is your voice in the selection of candidates to run for the various offices of the National Radio Institute Alumni Association. Read the balance of this column, then turn the blank over. The entire other side is devoted to your selections and signature.

There are seven offices to be filled. One president, four vice presidents, one secretary and one executive secretary. You are requested, in this ballot, to select a man for each position.

When the Ballots are checked at National Headquarters, the *two men having the highest number of votes for each office* will be considered as the candidates for the final run off and election. This election will be conducted in the next issue of NATIONAL RADIO NEWS.

All officers who served last year are candidates for re-election. You may vote for them if you wish, or you may select other men. Select any men you wish just as long as they are MEMBERS OF THE N. R. I. ALUMNI ASSOCIATION IN GOOD STANDING. You may vote for yourself if you so desire. Be sure to give the city and state of your selections to prevent any misunderstanding. The names of the officers who served last year are to be found on page 24 of this issue.

It is suggested that this slip be detached carefully from your NATIONAL RADIO NEWS so as not to damage the book. Tear off the slip at the dotted line, fill it out carefully, sign it and return it immediately to—P. J. Murray, Executive Secretary, N. R. I. Alumni Association, 1536 You St., Washington, D. C.

(Over)

Tear carefully along this line

*This is a very important nomination. Times are much better—the Alumni Association is ready to go forward to bigger and better goals. We must select very carefully the men we desire to handle the reins of our organization for the coming year. Give this matter some thought and send in your ballot.*

## Nomination Ballot

P. J. MURRAY, *Executive Secretary*,  
 N. R. I. Alumni Association,  
 1536 You St., N.W.  
 Washington, D. C.

I am submitting this Nomination Ballot for my choice of candidates for the coming election. The men below are those whom I would like to see elected as officers for the year 1935.

MY CHOICE FOR PRESIDENT IS

.....

City ..... State .....

MY CHOICE FOR FOUR VICE PRESIDENTS IS

1. ....

City ..... State .....

2. ....

City ..... State .....

3. ....

City ..... State .....

4. ....

City ..... State .....

MY CHOICE FOR SECRETARY IS

.....

City ..... State .....

MY CHOICE FOR EXECUTIVE SECRETARY IS

.....

City ..... State .....

Page Thirty

# NATIONAL RADIO NEWS

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 No. 4



Oct.-Nov.,  
 1934

Published every other month in the interest of the students and Alumni Association of the  
**NATIONAL RADIO INSTITUTE**  
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The Official Organ of the N. R. I. Alumni Association  
 P. J. Murray, Managing Editor

*Associate Editors:*

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 Chas. Jesse, Cleveland          E. R. Bennett, Chicago  
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 R. Clarkson, Phila.-Camden      J. L. Kearns, N. Y.-Brooklyn  
 A. G. Ruse, Toronto

Tear carefully along this line

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**UNIVERSAL**  
 This bulletin board and power supply system is a universal



# THE MAILBAG

In reply to Mr. A. H. Royce's question in the last issue of the News, I always find it most convenient to take the receiver from the customer's house. You can't help making some mess, besides you have to answer questions concerning different parts of the receiver, which causes loss of time. Also you may need some part that is in your shop. My advice is if the receiver needs servicing other than replacing tubes or repairs to aerial or ground, take it to the shop.

**Fred F. Bozzano, Upper Darby, Pa.**

— n r i —

I feel that the Radio-Trician loses too much time repairing sets in the customer's home. Besides, you have too many people bothering you—making suggestions for speeding up the job and saving money.

**Elie Jette, Montreal, Que., Canada.**

— n r i —

It just like a dream come true to finally see a page of NATIONAL RADIO NEWS devoted to service tips. Also, let me say I agree with Graduate A. H. Royce. Take the receiver to the shop for any extensive repairs.

**D. M. Royce, Laconia, N. H.**

— n r i —

I have been repairing sets in the residences of my customers for seven years, removing only those sets that proved to be stubborn or that required a great deal of time to complete satisfactorily. I give my customers ample chance to continue to another shop, but if they withhold the tough one for a later examination during odd moments and I am unable to give a satisfactory repair.

Nothing that makes me continue to do these jobs in the home is the fact that I have seen numerous cases of other Radio Tricians taking sets to shops and returning them to their customers with an enormous bill attached for parts and replacements not made. Home repairs eliminate all doubt in the truth.

Take the receiver out of the house while you are at a practice to tidy up your shop. Bring up my kit, now do your own reading of the instructions of the

**W. J. Wark, N. J.**

## OUR HAM LIST

- WSIIRH S. L. Chmielewski, Jackson, Mich.
- HRLAA E. W. Bodden, Ufila, Bay Islands, Honduras.
- W1GQM H. J. Stadler, Lawrence, Mass.
- W9RWE L. E. Angle, Sioux Falls, S. D.
- VE3ZS H. W. Scott, Galt, Ontario.
- W6KQH Dan Summers, Ceres, Calif.
- W9REM P. R. Parker, Des Moines, Iowa.
- W9SBS Harold Beckholdt, Eagle Grove, Iowa.
- W6LEM Jack Strellon, San Rafael, Calif.
- VE4PC D. Calnitsky, Winnipeg, Manitoba.
- W3BLN Norman Dalling, Pottstown, Pa.
- W7EKA A. W. Wesley, Black Diamond, Wash.
- W9RJF Kenneth Robieson, Lowry, Minn.

— n r i —

We have a lot more replies to Mr. Royce's question. This discussion will be continued in the next issue of NATIONAL RADIO NEWS.

— n r i —

Tell all the boys to be sure and ground the inner rotating flexible shaft to case of all Air-line Auto Radios by wrapping a small piece of copper braid around the shaft as it enters case. Do not use the rubber dust cap supplied. This stunt removes the stubborn cases of motor interference.

**Ray L. Wonderly, Casper, Wyo.**

— n r i —

I'd like to make a suggestion in regard to NATIONAL RADIO NEWS. Why not put the pages, containing the data sheets and diagrams in the very center of the book? Fellows who remove them and bind them can then do so without tearing up the sheets or the magazine.

**A. B. Spanier, Miami, Fla.**

— n r i —

In making up a magazine the only double page which may be printed all the way across is the "centerspread" to which Mr. Spanier refers. The "centerspread" is therefore retained for feature articles which require illustrations. We suggest removing the data sheets, that the wire stitches be raised with a knife, the pages lifted off those other than the data sheets be returned to their places and the wire stitches pressed back in place. The data sheets and the rest of the magazine will not be harmed.—Editor

# Build Yourself a Valuable Radio Library with these Helpful FREE MANUFACTURERS' BOOKLETS and CATALOGS

## A FREE SERVICE DESIGNED TO SAVE YOU TIME AND MONEY

The cooperation of the manufacturers whose catalogs, literature and booklets are listed on this page, and the courtesy of the Calcatterra Catalog Service, has made it possible for the N. R. I. Alumni Association to offer to readers of National Radio News a unique and money-saving service in obtaining Radio manufacturers' literature.

All that is necessary for you to obtain the catalogs or other literature listed on this page is to write the

numbers of the items in which you are interested on the coupon, fill in the information asked for and MAIL IT TO THE CALCATTERRA CATALOG SERVICE. DO NOT MAIL COUPONS TO THE NATIONAL RADIO INSTITUTE AS THAT WILL DELAY THE FILLING OF YOUR ORDER.

Stocks of the publications listed are kept on hand and they will be sent to you promptly, as long as the supply lasts.

2. HAMMARLUND 1934 PARTS CATALOG. 10 pages. Variable and adjustable condensers, sockets, coils, intermediate frequency transformers, chokes, etc., for broadcast and short wave work.

4. HAMMARLUND-ROBERTS 15 TO 200 METER COMET "PRO" SUPERHETERODYNE. Details of a receiver designed especially for laboratory, newspaper, police, airport and steamship use.

5. ELECTRAD 1934 CATALOG. 16 pages. Standard and replacement volume controls, Truvolt adjustable resistors, voltage dividers, vitreous enamelled fixed resistors, public address systems, etc.

6. AMPERITE REAL LINE VOLTAGE CONTROL. Characteristics, uses and chart showing the correct Amperite recommended by set manufacturers for their sets.

9. INTERNATIONAL 1934 RESISTOR CATALOG. Specifications and prices on International Metallized, Precision wire wound and enamelled wire wound resistors, motor Radio noise suppressors and resistor kits.

10. INFORMATION ON THE SUPPRESSION OF MOTOR RADIO NOISES. Circuits and data published by the International Resistance Company on how to overcome troublesome motor noises in auto Radio installations.

25. LYNCH NOISE-REDUCING ANTENNA SYSTEMS. This folder describes the two types of noise-reducing antenna systems perfected by the Lynch Mfg. Co. for both broadcast and short-wave reception. The transposition type system can be used on both long and short waves while the shielded transmission line type is especially suited for broadcast receivers.

26. LYNCH AUTO RADIO ANTENNAS, FILTERS AND NOISE SUPPRESSORS. This folder describes a complete line of Lynch antennas, filters and ignition noise suppressors, especially designed for motor Radio installations. Complete data on how to eliminate motor Radio noise is included.

34. ELECTRAD SERVICEMEN'S REPLACEMENT VOLUME CONTROL GUIDE. A 44-page vest-pocket size booklet containing a revised, complete list, in alphabetical order, of over 2,000 different receiver models with the proper type of Electrad Control to use for replacements.

40. IRC RESISTANCE INDICATOR. A complete description of an instrument designed by the International Resistance Co. to enable servicemen and other Radio men to determine the exact resistance value of a defective resistor without the use of meters, wiring diagrams or specifications of the receiver circuit.

52. THE I. R. C. SERVICER. A free monthly house organ published by the International Resistance Co. A sample copy will be sent on request through this service, after which you can subscribe to it, if you like it, by writing direct to the International Resistance Co.

56. SUPREME SERVICING AND TESTING INSTRUMENTS. A catalog containing complete descriptions of new line of Supreme low-price analyzers, set testers, testers, ohmmeters, capacity testers, oscillators and sal meters.

57. HOW TO BUILD A HIGH-QUALITY CONDENSER OR RIBBON MICROPHONE. This describes the Superior Microphone Kit sheets with which it is possible to build, quickly and easily, a high-quality condenser or ribbon microphone made by the Bruno Division of the Amertron Co.

59. THE IRC VOLT-OHMMETER. A complete description of the characteristics and uses of the International Resistance Co. Volt-Ohmmeter, a combination volt-meter specially designed for the point-to-point troubleshooting. The instrument contains a Vacuum Relay feature which gives protection against burnouts.

60. AMERTRAN AUDIO AMPLIFIERS AND ADDRESS AMPLIFIERS AND ADDRESS AMPLIFIERS AND ADDRESS AMPLIFIERS. A complete description of a wide variety of AmerTran De Luxe (high priced line) audio and power transformers.

63. AMERTRAN MODERN QUALITY TRANSFORMERS. A complete description of the AmerTran Silcor line of a transformers and chokes, designed for use in radio receivers, transmitters and amateur transmission mounting features are incorporated.

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Please send me, without charge or obligation, the catalogs, booklets, etc., whose numbers I have filled in below.

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 ( ) Serviceman employed by:  
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 ( ) Jobber  
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 ( ) Servicing organization  
 ( ) Dealer  
 ( ) Jobber  
 ( ) Radio Engineer  
 ( ) Experimenter  
 ( ) Laboratory Technician  
 ( ) Professional or Amateur Set Builder  
 ( ) Licensed Amateur  
 ( ) Station Operator  
 ( ) Manufacturers' Executive  
 ( ) Student  
 ( ) Public Address Work

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