

**APRIL - MAY, 1936**

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**NATIONAL RADIO NEWS**

**WASHINGTON, D.C.**



## Just Another Alibi...

**A** LONG about this time of the year, there is a great tendency to push aside the more important things in favor of play.

The weather gets warm—days are beautiful and long—there is a great urge to be out of doors, doing almost anything that doesn't require thought or work. We call it Spring Fever and encourage ourselves to believe it is a malady over which we have no control, just like mumps or measles—when deep down in our hearts we know "Spring Fever" is just a fancy name for "plain, common, everyday laziness."

Now this idea of putting aside the important duties of life, for the pleasures and relaxation of spring, can have very disastrous, far-reaching effects upon your whole future. Remember how Mark Twain's *Huckleberry Finn* used the greater part of his time for play? He swam, he fished, while *Tom Sawyer* solved problems. In the end, *Tom Sawyer* gained wealth—fame—the respect of his townspeople. *Huck Finn*, on the other hand, was still fishing—was still playing—when he was an old man. It was the only thing he had ever learned to do.

This message is going to be read by a number of *Tom Sawyers* and a number of *Huckleberry Finns*. The *Tom Sawyers* will take its message seriously—keep right on with their studies—go forward to success—prosperity—happiness. But the others—the *Huckleberry Finns* who read it, while they will admit it is all very true, will still succumb to the wiles of Dame Nature and her beautiful spring garb.

What are you going to do about it? Which class are you going to be in—the *Tom Sawyers* or the *Huckleberry Finns*? If you put off until tomorrow—if you allow yourself to get out of harness—you are going to find it mighty hard to get back on the road leading to your success goal. It's hard to take up the reins again once you put them down—and even if you do take them up, you'll find yourself far behind in the race toward a brighter future.

You may be just starting your training—or you may be well advanced in it. That makes no difference. If you keep on growing, steadily, you'll be ready to step into the high pay sparetime or fulltime jobs that Radio offers, much sooner than the fellow who stops by the wayside to trifle, charmed by the beauty of spring.

E. R. HAAS,  
Vice-President and Director.



# New P.A. System Meets Long-Felt Need

Particularly adapted to schools, hospitals, hotels, department stores

A NEW Program Sound System, embodying unique advantages for sizeable buildings such as schools, hotels, department stores and hospitals, has been introduced by the Western Electric Company. The system has been designed by Bell Telephone Laboratories for distributing programs from microphones, from Radio receivers, or from phonograph records, and is wholly operated from a single cabinet. In the cabinet are centered all controls, the flexible switching arrangements, a Radio receiver, an electric phonograph, amplifying equipment and a combination loudspeaker and microphone device.

One feature of the system is that it provides "talk-back" facilities. Sound not only may be sent out for reproduction over distant loudspeakers, but the same loudspeakers may in turn be used as microphones for picking up sound which is transmitted back to the central point.

In many types of service, the "talk-back" feature has special importance, in that it offers a means for overhearing in the central office what is happening at any loudspeaker location.



Nurse paging doctor in hospital with Western Electric P. A. System. System may also be used to supply patients with Radio programs.

For example, the principal of a school may listen to the work in any classroom, or the proprietor of a department store may overhear transactions between personnel and patrons in any department he desires.

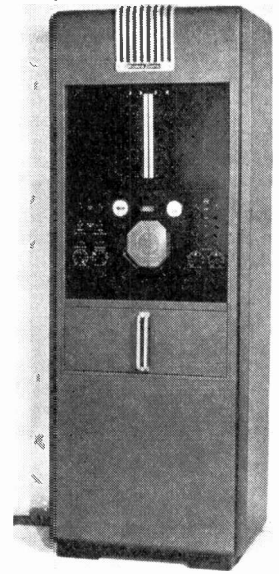
In hotels, the system not only supplies entertainment to guest rooms in the form of Radio programs and recorded selections, but it may also be employed to amplify and distribute music from the hotel's own orchestra. Moreover, it may be used for paging throughout public rooms and corridors.

In hospitals, it likewise serves for paging doctors throughout the institution. The talk-back circuit makes it possible for a doctor to talk with the main office over the nearest loudspeaker extension. Radio programs and recorded selections furnish diversion in rooms where convalescent patients are located.

As an aid in teaching music and the languages, the sound system brings special recordings right to the classroom, as well as providing distribution of Radio programs throughout the building. Announcements may be made and fire drills directed from the principal's office. Music may be furnished for gatherings in the auditorium, and the amplifying facilities may be employed to reinforce speakers' voices.

Two variations of the program sound system are available. The first arrangement provides for a single program, and the second for the choice of two simultaneous programs. In the first case, one amplifier is used, and in the second, two. Switching facilities include as many as 60 keys for controlling the loudspeaker or headphone extensions. These keys are mounted in groups of 20, and may be

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## New P. A. System

(Continued from page 3)

wired so as to control each extension individually or several extensions in groups, as required.

The Radio receiver is of the high fidelity type, covering a band of frequencies ranging from 520 to 23,000 kilocycles. This wide band includes not only domestic broadcast stations, but also



Western Electric P. A. System in use for supplying department store patrons with Radio programs or with announcements of special sales, etc.

police, aircraft and amateur stations, as well as foreign broadcast stations. Automatic volume control eliminates to a great extent the fading of foreign short wave stations.

The two-speed electric phonograph is mounted in a retractable drawer. This may be pulled out for convenient operation or closed up flush with the front of the cabinet, as desired. The cabinet is 5 feet 4 inches high, 2 feet wide, and 16 inches deep, and its exterior has been designed along modernistic lines, so as to present an attractive appearance in office or foyer.

Besides the built-in microphone facilities, additional microphones may be located in offices or nearby halls or ballrooms, as required. Controls are arranged so that announcements may be made over any one or any group of loudspeakers, or in emergency, over all of them, regardless of whether they are turned on or off at their respective locations.

## New Developments of Interest to the Radioman

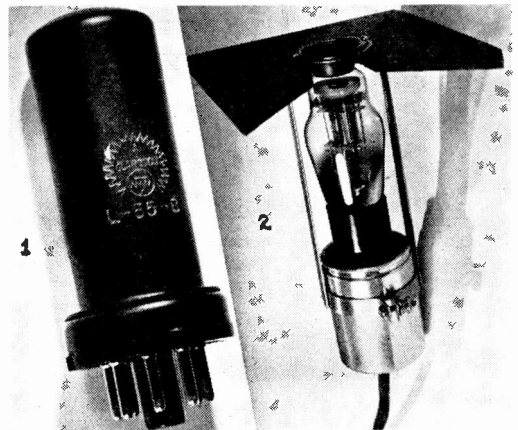
A new simple unit, the Taco Tuning Indicator (illustration 2), brings electron-eye tuning to any set. This self-contained unit uses the 6E5 or electron-eye tube, and obtains its power supply from the Radio set itself. Installation consists merely in cutting or drilling a hole in the set panel and mounting the bracket behind the panel. In tuning, the operator views the electron-eye target of the 6E5 tube through the bezel window.

Prices may be obtained from the manufacturer, the Technical Appliance Corporation, 17 East 16th Street, New York City.

Employing a standard metal-tube casing, and 8-prong base, this line voltage dropping resistor, provides a solution of the AC-DC series-filament supply problem. (See illustration 1, below.)

Identical to metal-tube 25Z6 rectifier and 25A6 power tube, the resistor is installed by providing another octal socket.

The new resistor is available in any total voltage drop and for practically all pilot lamp and tube combinations. Ballast action in pilot lamp resistor section can be provided. There are three standard types available, covering the pilot lamp and filament requirements of 4, 5 and 6 tube sets.



# The Service Forum

Conducted by

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



*I wish to express my appreciation for the very helpful assistance of Student J. Tapp, Stroudsburg, Pa., in the preparation of the Service Forum for this issue.*

————— n r i —————

## **AIRLINE MODEL 811 ROARING NOISE AT FULL VOLUME**

Replace 15,000 ohm resistor connected between cathode and screen of R. F. tube, also replace resistor connected across tone control.

————— n r i —————

## **APEX MODEL 8 MUFFLED AND WEAK INTERMITTENTLY**

Replace 550 ohm bias resistor in the output tube circuit. A. V. C. tube may check good but will not function properly. Replace. Resolder ground connection on voltage divider.

————— n r i —————

## **ATWATER KENT MODEL 84 MUFFLED**

Shield plate lead of oscillator tube.

————— n r i —————

## **ATWATER KENT MODEL 480 LOUD HISSING**

Place 5,000 to 10,000 ohm resistor in plate supply of oscillator tube.

————— n r i —————

## **DELCO MODEL 3203-3204 DEAD 32 VOLT**

Check .25 mfd. condenser—first condenser between power transformer and choke coil—in diagram it is part No. C 19. Check dual filter condenser (8 and 12 mfd.) when plate voltage is low.

————— n r i —————

## **DELCO CAR RADIOS— VIBRATOR HASH OLDSMOBILE, PONTIAC, ETC.**

This may be very confusing and may be caused by an intermittent condition in 42 output tube. In one I serviced, this tube checked O. K., but the condition was corrected when another tube was used.

## **DELCO CAR RADIOS— OLDSMOBILE, PONTIAC, ETC.**

## **MORE PEP**

Volume can be stepped up by substituting a 500 ohm resistor (bias) in place of the 1500 ohm resistor that is used without any harm to reception. This resistor is connected between the 6D6 cathode and ground.

————— n r i —————

## **DELCO CAR RADIOS— OLDSMOBILE, PONTIAC, ETC.**

## **SET DEAD**

High drain on battery (About 16 amps.). The .006 condenser connected in the plate circuit of output tube may be the cause. I have had three or four of these sets where this condenser has shorted. It can be replaced with a condenser up to .01 mfd. without apparent harm to reception.

————— n r i —————

## **PHILCO MODEL 296-296A**

## **WEAK AND DISTORTED**

Check 25,000 ohm resistor in first A. F. stage. Replace coupling condenser between detector and first A. F. stages. This is .05 mfd.

————— n r i —————

## **PHILCO MODEL 71**

## **INTERMITTENT**

Replace coupling condenser in last stage. This is condenser No. 36 in schematic.

————— n r i —————

## **R. C. A. MODEL M34**

## **DEAD**

Replace vibrator base. There is contained therein, two .03 mfd. condensers and these very often short.

(Page 6, please)

# The Service Forum (Continued from page 5)

## SILVERTONE MODEL 1722

## MOTORBOATING OR NO NEON FLASHER ACTION

Replace dual condenser (4 and 8 mfd.). This is part no 8780.

————— *n r i* —————

## SILVERTONE MODEL 7134

## DEAD

Check .01 mfd. coupling condenser connected between plate of 57 tube and grid of 2A5. The reception of this set is characteristically weak.

————— *n r i* —————

## SILVERTONE BATTERY MICROPHONICS MODELS

Very often caused by control shafts touching cabinet.

————— *n r i* —————

## SILVERTONE MODEL 1803

## DEAD

Open in 1700 ohm section of Candohm resistor. This cuts off screen supply.

————— *n r i* —————

## SILVERTONE SPEAKER OVERLOADED MODEL 1831 SPEAKER RATTLE

Change .02 series condenser in the small speaker to a size between .005 to .01 mfd.

————— *n r i* —————

## SILVERTONE ABRUPT VOL. CONTROL MODEL 1850

Watch for over-sensitive 951 tube. Try using  $1\frac{1}{2}$  v. "C" bias instead of 3 v.

————— *n r i* —————

## EDISON MODEL 7R

## EXTREME DISTORTION

A .16 mfd. condenser in conjunction with a 6,000 ohm resistor comprises a hum balance. The condenser, when shorted, causes a high voltage to exist on cathode of first A. F. tube, thereby causing the distortion. The hum balance can be cut out of circuit entirely without affecting the reception.

————— *n r i* —————

## EMERSON MODEL F

## INTERMITTENT AND OSCILLATION

Check condenser in the cathode circuit of first A. F. tube. Check .1 mfd. condenser in plate circuit of detector.

## ALL GENERAL MOTORS

## EVERY JOB

Check resistors that shunt the speaker field.

————— *n r i* —————

## G. E. S132 (VICTOR R10) MOTORBOATING

Change '35 tubes.

————— *n r i* —————

## KOLSTER MODEL 6K

## HUM

May be caused by 27 detector tube even though this tube should check good.

————— *n r i* —————

## KOLSTER MODEL K20

## DEAD

Check resistors in the grid circuits of 1st and 2nd R. F. stages. Very often these should be replaced. 850 ohm resistor in the 1st stage and 1,100 ohm resistor in 2nd stage.

————— *n r i* —————

## SILVERTONE MODEL 1840

## DEAD

Replace 10,000 ohm resistor in oscillator plate supply.

————— *n r i* —————

## R. C. A. VICTOR MODEL R82

## NOISY AT HIGH FREQUENCY END OF DIAL

Replace oscillator tube and adjust.

————— *n r i* —————

## RADIOLA MODEL 17 LOUD HUM WHEN FIRST TURNED ON

Watch for a 12A tube in output stage. This type tube does not function as well as a 71A in this set.

————— *n r i* —————

## SIMPLEX MODEL J

## DEAD AT LOW FREQUENCIES

Try several 24 type tubes in the detector oscillator stage. If you have one of the old type 24 type tubes, you will probably find that it will function satisfactorily. If you do not have such a tube on hand, try reducing the value of the 700 ohm bias resistor by about one-third. A 400 or 500 ohm bias resistor will probably enable you to obtain satisfactory results.

————— *n r i* —————

## STEWART WARNER MODEL 102

## IMPROVED PERFORMANCE

In order to improve pentode tube performance on early production sets of this series, make the following changes. (a) Cut the connection

(Page 27, please)

## Wholesale Radio Service Holds Meeting

More than 2,300 Radio amateurs and short-wave fans jammed the grand ballroom of the Hotel Pennsylvania, New York, on Monday evening, February 3, 1936, to attend the second "ham-fest" sponsored by Wholesale Radio Service Co., Inc. of 100-6th Ave., New York, N. Y. This is said to be the largest individual turnout of Radio amateurs on record in the metropolitan area.

Exhibits of new apparatus by five manufacturers and a series of interesting talks by well-known technical speakers kept the crowd occupied from 6 P. M. until midnight. The featured talker of the evening was Robert S. Kruse, Engineering Editor of "Radio," who gave an illustrated lecture on Radio frequency amplifier design and operation.

More than one hundred prizes were given out at the end of the evening, the winners being selected through drawings of door stubs. The prizes ranged from small resistors to an expensive velocity microphone. The affair was voted a huge success by attending amateurs.

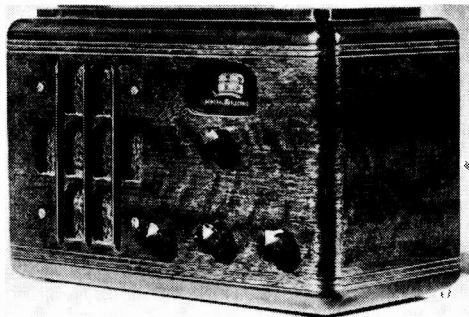
— n r i —

### Five New G-E Receivers

General Electric announces five new receivers, each employing a new type metal tube, the 6Q7 duodiode-triode, which permits unusually high sensitivity, selectivity, and power output. Two of the sets are consoles and three table models. One of the latter is a compact A.C.-D.C. receiver, the others being designed for standard A.C. operation. All provide short-wave reception.

The new 6Q7 duodiode-triode combines the functions of detector, audio amplifier, and auto-

matic volume control. Its high amplification contributes to the sensitivity and selectivity of the sets, and affords greater reserve of undistorted power output.



New G-E Receiver, Model A-54

Table model A-52 and console model A-55 are both equipped with the same two-band five-tube chassis and with a new wide-vision, two-color tuning dial. An I.F. wave trap is incorporated in the chassis to reject telegraph interference on the intermediate frequency. A stabilized dynamic speaker of the eight-inch type is used with the A-52, and one of the nine-inch type with the A-55. Power output is five watts. The two bands cover 540-1720 and 2300-7000 kilocycles.

A three-band, eight-tube chassis is used in table model A-83 and console model A-85. Both sets have a sliding rule tuning scale with automatic vernier tuning, push-pull output, and a speech-music control. A stabilized dynamic speaker of the nine-inch type is used with the A-83 and one of the eleven-inch type with the A-85. Power output is ten watts. The three bands cover 535-1720, 1720-5800, and 5800-18,000 kilocycles.

The A.C.-D.C. receiver, table model A-54, utilizes a two-band five-tube chassis and is designed for 110-volt operation. Besides the 6Q7, it employs two other new types of metal tubes, the 25Z6 rectifier and the 25A6 power-amplifier pentode. It has the new wide-vision dial, a stabilized dynamic speaker of the 6½-inch type and two bands which cover 540-1720 and 2250-7500 kilocycles.

Prices will be furnished by the manufacturer upon request.

### What Was Spent for Radio in 1935?

5,700,000 Radio sets, with tubes .....	\$336,000,000
39,000,000 tube replacements .....	31,000,000
Electricity and batteries to operate 25,500,000 home sets .....	154,000,000
Repairs and servicing of sets (minus replacement-tube sales) .....	68,000,000
Broadcasting time sold .....	86,000,000
Broadcast talent costs .....	25,000,000
<b>1935 Total</b> .....	<b>\$700,000,000</b>

Compiled by RADIO TODAY.

## National Radio Servicemen's Week

The National Radio Service Association voted to set aside the fourth week in May of every year as "Radio Servicemen's Week."

This plan is being carried out with the thought of better acquainting the public with the virtues of all Radio men and all Radio men's associations.

During this week attention will be directed upon the serviceman and the important part he today plays in everyday life of John Public.

All Radio servicemen and all branches of the Radio Industry are urged to participate in making this a success.

Additional information as to how every branch of the Radio Industry may participate and derive benefits of this plan will be released each month.

Those desiring additional information may write to The National Radio Service Association, 714 Anico Building, Galveston, Texas.

— n r i —

## Arcturus Adds Three Tubes to Coronet Metal Line

Three new types have just been added to the "Coronet" Metal Tube Line, manufactured by the Arcturus Radio Tube Company.

The type 6N7 Coronet is a Class "B" complete output tube. In addition, it can be used in the driver stage as a Class "A" amplifier for driving the input circuit of a 6N7 operating as a Class "B" amplifier. This tube is similar in characteristics to the 6A6.

The 25A6 Coronet is a 25.0 volt output tube, identical to the type 43, and is for use in A.C.-D.C. receivers. The 25Z6 Coronet, identical in characteristics to the 25Z5, is a 25.0 volt full-wave rectifier for A.C.-D.C. operation.

— n r i —

## New Zealander Wins Prize

W. H. Piercy, short-wave Radio listener of South Invercargill, New Zealand, has won the electric study lamp offered by the General Electric Company to the person logging the December 22 "Melody Master" Radio program, on short-wave station W2XAF, from the farthest distance from Schenectady.

South Invercargill is 9,430 statute miles from W2XAF.

## Radio Stove Cooks without Flame or Heat

Who knows but what in a short while the tired working man upon reaching his home of an evening and becoming impatient for dinner, will ask his wife, "Haven't you Radioed that steak yet?"

Radio's newest innovation, the Radio stove, as yet only in the experimental stage, cooks meat, vegetables, and other foods in a few minutes as compared with the hours required for cooking by conventional methods, according to a popular magazine.

The Radio stove resembles the old-fashioned coal-and-wood range with which we are all familiar, with circular plates over which the cooking is performed. There the similarity ends, however. Although these plates remain cold, a pan of water placed on one of them will come to a boil before you can say "Jack Robiusion."

The strange part of it is that there is no flame, fire, or heat present at any time during the process of cooking. Another unusual characteristic of cooking by this method is that the odors attendant upon ordinary cooking are absent. For instance, cabbage gives off no odor. The nature of the food cooked is changed even. Toast burned almost to a cinder doesn't taste like the charred bread that most of us who have to eat our morning meal in restaurants have learned to expect.

The top of the stove may be made of any hard material except metal, such as wood, composition board, or some moulded material like bakelite. Under each cooking plate is a coil that picks up high frequency Radio waves set up by an oscillator tube within the stove itself. By this means, the stove generates its own Radio waves, the source of power being the household lighting circuit.

In operation, the Radio waves in passing through the non-metallic top of the stove establish contact with the food which is cooked by the heat produced by its own resistance to the current. In this manner, the heat necessary for cooking is generated within the food itself, which is cooked from within, thus retaining all its juices and flavor.

It is not difficult to see the big improvement cooking by Radio constitutes over conventional methods, once the Radio stove is developed to the point where it can be used generally. No one can say when that will be, but an electrical supplies manufacturer in Brooklyn, who has undertaken its development, is daily performing some kind of cooking on the Radio stove on a large scale.



# CONTEST !!

Somebody is going to win \$10—somebody else \$5—and we're all in for a treat on "J. E.!"

Mr. Smith receives so many letters from students and graduates asking about how the other fellows—the rest of the N. R. I. family—are getting along, that he's hit upon a plan for giving us a look at a few of the shops of the students and graduates who not only have the best shops, but also take the best photographs of them.

And to the victors go the spoils—to the student or graduate sending in the best photo Mr. Smith will award a prize of \$10. Second prize, \$5.

You don't have to have a big store, either, to enter this contest. The photo does not necessarily have to be of a store, although it may. It can just as well be a photo of equipment, work bench, P. A. system, of yourself working on a receiver with your set analyzer and other testing apparatus in full view, etc., etc. The important thing is that it be a GOOD picture of a good subject.

Photographs submitted should be glossy prints, at least 3x5 inches, and will be judged on the following merits:

1. Neatness
2. Business-like appearance
3. Quality of photograph

The winning photo will appear in the next issue of the News. Contest closes May 1st, the prizes to be awarded on May 15th. Photos submitted will not be returned.

There is a possibility that if this contest is successful and interesting pictures are obtained, Mr. Smith may continue it indefinitely, thus giving everybody a chance to show what he's doing in Radio and at the same time earn some "easy money."

Regardless of that, here's a ten-spot and its half-grown brother going a-begging, NOW! Dig out your cameras, fellows,—or better still, get some photographer friend to dig his out—and get going!

## New P. A. Amplifier

A high-gain, low-cost public address amplifier, available in metal and glass tube models, is offered by Lafayette Radio Manufacturing Co., of New York City. Amplification of 124 decibels in a unit measuring only 9½" by 9½" high makes use of a pre-amplifier unnecessary even when using a microphone of the lowest output level now commercially available.

Eight tubes are used. In the metal tube model two 6F6's serve as pre-amplifiers in the two input channels, which are mixed in the tube following, a 6A6. A 605 follows as voltage amplifier, coupled into a 6F6 as driver. The driver stage is transformer-coupled to the output, consisting of two 6F6's. The rectifier is an 83.

A glass-tube model is also available in which the pre-amplifier stage is served by two 75's, the mixer remains a 6A6, the voltage amplifier is a 76, the driver stage uses a 42, and the output stage consists of two 42's.

The metal tube model is coded as Lafayette amplifier Model 251-A, and the glass tube version as Lafayette Model 247-A.

Input impedances are high; output impedances are from .7 to 15 ohms, 250 and 500 ohms.

The face of the panel mounts three controls, of which two are the mixer gain controls, and one the tone control. Steel grill cover is provided. Another feature required by the high gain consists of input terminal metal shield caps, added in order that not even the binding posts of the input circuits may remain unshielded.

Recommended uses are for announcing systems, communication systems, mobile P.A. when a source of A.C. is included in the car or truck, hearing aids, school systems and general public address work.

Output is 15 watts to a 500 ohm line, frequency response within three decibels between 50 and 10,000 C.P.S., harmonic content at maximum output, 6%. Hum level is 45 db below sound output, and power consumption from A.C. line is 90 watts.

## — n r i — Has He?

One of Mr. Dowie's assistants was wondering the other day whether Student No. 6TC13 has the four automobiles indicated in his name and address:

MACK FRANKLIN,  
46 CADILLAC AVE., PONTIAC, MICH.

## — n r i — Established Radio Business Offered for Sale

—in Danville, Virginia. Due to pressure of other business interest, proprietor claims he will sell paying business at a sacrifice figure. For complete information write to C. Victor Johnson, 556 Worsham St., Danville, Va.



GEORGE  
ROHRICH  
Engineer in  
charge N. R. I.  
Laboratory

# Spectacles and

By GEORGE

see no objection to using "the ear method," and would probably do so myself.

But attempting to use signal generators which are not calibrated is to my mind about on the level with trying to correct eye sight with improperly fitted "specs." In either case matters will become worse instead of better.

I use a signal generator which is calibrated and check it constantly against a well-calibrated receiver, especially when I work on a badly aligned receiver in my home work shop. In the vicinity of my home the average set will bring in six stations with about equal volume at the position of the dial shown in Figure 1. On other receivers I can get several additional stations with about the same volume as my locals, some of which stations are broadcasting the same or similar programs.

I have often experienced difficulty in distinguishing one station from another while aligning some superheterodyne type receivers by "the ear method," and in more than one case I have added to my grief by supposing that I was working on the trimmer adjustment for WJSV, only to discover later that I had somehow selected the signals from WOL and aligned it to come in at the WJSV markings on the dial, with another unknown station so near the setting for WOL that I had believed it to be that station.

Several experiences of this kind convinced me of the inaccuracy of "the ear method," regardless of by whom it is used, and I have accordingly become "sold" on the calibrated signal generator to supply a signal with a tone that cannot readily be mistaken. Other experiences, especially while aligning the all-wave type receivers, have further convinced me that an untold amount of time can be saved with a signal generator properly calibrated so that it can be depended upon to produce the frequency needed.

My own accurately calibrated signal generator is dependent on my properly calibrated all-wave receiver, which in turn is dependent on a frequent check of known signals received from broadcast stations for frequencies between 600 and 1460 kc, and an occasional check at 5, 10, and 15 m.c. obtained from the standard frequency signals sent out at these frequencies from station WWV by the Bureau of Standards at Washington, D. C., which are heard in all parts of the world on Tuesday and Friday of each week. These signals are steady unmodulated signals, producing a steady hissing type of sound like that heard when listening to a carrier wave of a broadcast station while the microphone is idle. Identification of the Station

**O**CCASIONALLY a serviceman asks me why signal generators and cathode ray equipment are recommended for aligning receivers, when it can be done so much more easily and simply by what I call "the ear method." (Tuning in on a local station for signals and then determining when the signals are best only by their sound to the ear.)

I presented my doctor with a similar problem in another field of science several years ago when I complained to him of frequent headaches. He said these headaches were a result of eye strain and asked if I wore the reading glasses he had prescribed for me sometime before. I said no, and asked, "Why bother with them when I can get along without them?"

"Yes, of course, you can get along without them," he replied "*but not nearly as well*. You are considering them in the light of 'a fifth wheel to a wagon,' whereas they really are a necessary aid, not a useless addition to your visual equipment. Wear them and you'll find you can use your eyes more efficiently and with less strain."

He was right—and since then I have often thought the doctor's words apply just as much to such equipment as signal generators and cathode ray apparatus, the Radio man's "specs." Sure, he *can* get along without them, *but not nearly as well!*

Why, then, do some servicemen claim they get better results by "the ear method?" Careful investigation has disclosed the fact that these men did not have their signal generators calibrated, so they could depend on them, or that they were located where there are only two or three local broadcast stations whose signals can be identified on the receivers on which they work without the probability of confusing the signals of two or more stations. I also found that they usually worked on receivers only slightly out of alignment and needing only a slight "touching up." Under such conditions I

# Signal Generators

ROHRICH

WWV is made in the Radiotelegraph code every fifteen minutes. Each transmission lasts one hour. The 15 m.c. signal is sent out from 12:00 noon to 1:00 P. M. (E. S. T.); the 10 m.c. signal is sent out from 1:15 P. M. to 2:15 P. M. (E. S. T.); and the 5 m.c. signal is sent out from 2:30 P. M. to 3:30 P. M. (E. S. T.).

Just as the ordinary signal generator found in the average serviceman's shop has replaced "the ear method," so the special wobblator type of signal generator and cathode ray oscillograph will find greater favor, as against the ordinary type of signal generator for aligning even more dependably. I find this latter equipment very easy to handle, especially while taking care of the low frequency padder adjustments in a superheterodyne, commonly referred to as "the rocking adjustment," made at 600 kc. in a broadcast type superheterodyne type receiver.

This "rocking adjustment" is performed while using a standard signal generator, or signals from a broadcasting station. The signal generator is set to produce 600 kc., on a frequency of Station WCAO in Figure 1. The signal is expected to come in somewhere near the 600 mark on the dial, but as it is not certain just where it will come in, the receiver dial should be moved back and forth in order to locate the best adjustment, which will be obtained from the alignment already existing in the R. F. stages in the receiver. This "rocking procedure" is nothing more than tuning in for the loudest signal with the receiver tuning condenser dial, and at the same time trying to improve reception by further adjustment of the oscillator padder condenser.

If you wish, you can leave the receiver dial at the 600 mark and then make the "rocking adjustment" by moving the dial of the signal

generator back and forth to find the loudest signal. When you complete this double procedure of rocking and padding, then you will probably find that WCAO will come in not exactly at 600 kc. as we would like, but instead will come in slightly off alignment, to either one side or the other of the exact mark. When it does come in, it will be loud, however, because during this "rocking adjustment" we have adjusted the receiver for sensitivity and sacrificed exact calibration in so doing. As is well known, the slightest movement of a sensitively aligned dial will often mean the difference between hearing and not hearing a different station.

With the wobblator type of signal generator, which is used with a cathode ray oscillograph, you simply leave the receiver dial at the 600 kc. position. The wobblator condenser in the signal generator performs the "rocking adjustment" automatically, accomplishing the same result as moving the signal generator dial back and forth. Then all that is necessary is to adjust the padder condenser until the curve on the oscillograph screen shows the greatest vertical deflection. This indicates sensitivity, which is the goal.

Usually it does not matter if the alignment is not exact, as long as it falls within 4 or 5 kc. of this exact kc. mark. The average customer is more interested in sensitivity than alignment, and so seldom appreciates exact alignment that he is unwilling to pay for the extra time involved in getting it. Besides, I find that with an ordinary signal generator I must constantly repeat the rocking procedure after changing the R. F. tuning by bending the rotor plates, and repeating the padding procedure also.

On the other hand, with the wobblator type signal generator I can bend the rotor plates with one hand and adjust the padder with the other while watching the double type curve on the oscillograph where it will overlap, showing me when I establish exact resonance, and then watch that I maintain the maximum height of the curve with the padder adjustment.

I'm sure that any Radio-Trician who will learn to use them properly will come to the same conclusion that I have regarding modern, up-to-date testing equipment—and that, as the doctor said about my "specs," instead of being a "fifth wheel to a wagon," they are necessary aids to doing a job better, quicker, more efficiently, in keeping with the standards set by the age in which we live.

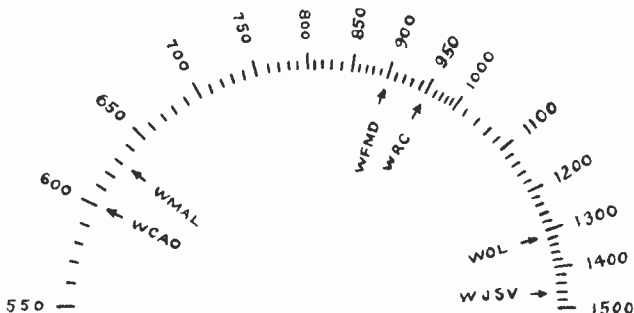


Fig. 1

# Service Department

The purpose of this page, conducted by the Student Service Department, is to give you information necessary to help you get good service at all times. The instructions given below are those which are most often overlooked. This oversight is the cause of our being unable to give as good service as desired. In forthcoming issues the Department will give such additional information as the need for it is shown by conditions.

————— n r i —————

## REQUESTS FOR CONSULTATION SERVICE

Always use a Consultation Service Blank in writing the Consultation Department for technical data or for help on your lessons. Otherwise it takes just *twice* as long to give you the information you want. Even if you happen to be writing some other member of the faculty than Mr. Dowie on an entirely different subject, and at the same time want help or advice from the Consultation Department, request it *separately* on a Consultation Service Blank and enclose it with your letter. This will insure the quickest possible service.

————— n r i —————

## USE STUDENT NUMBER

— — — on every piece of mail you send to the Institute. We know that every student and graduate *thinks* that he does put his number on all lessons, letters, etc. Nevertheless there is not a day goes by that the Mailman does not bring us letters, lessons, etc., containing no student number whatever. Other communications come in with the student number on the envelope only; then, when the letter is opened and the envelope detached or destroyed, there is no student number on the letter itself, thus causing another loss of time in the necessity for looking up the student number. Put your student number on every piece of mail you send in to the Institute.

If you are a graduate, indicate this by the word "graduate" ahead of your number. For instance, if your name is Tom Jones and your number is 14 TA 63, indicate that you are a graduate by signing your name: "Tom Jones, Graduate 14 TA 63."

## WHEN YOU MOVE

— — — particularly call our attention to it at once. It is not enough simply to show your new address on your lessons and in your letters, because whoever reads your letters may assume that the address shown on your letter or lesson is the same as it has been all along. Mention in your letter that you have moved and that your new address is shown on the letter itself.

Also, be sure to put your new address on your lessons. As you know, we use window-faced envelopes and your lessons will be returned to the address you yourself put on them. So, if you put your *old* address on your lessons, they will be returned to your *old* address.

If you live in a section where there is no Post Office substation, be sure to give the substation serving the section. For example, an Institute employee lives in Seven Oaks, Md., and has always had difficulty getting his mail because there is no substation in Seven Oaks. It is served by the post office of the nearest town, Silver Spring. This employee, since learning the cause of his poor mailing connections, now gives his address as: "Seven Oaks, Silver Spring, Md." (Preceded by his street address, of course.) Sometimes, where there are mailing difficulties of any sort, it is advisable to include even the county, in your address.

————— n r i —————

## EXPRESS SHIPMENTS

Whenever you order material from the Institute that is sent by express—such as Batteries, Nacometers, etc.—make certain that we have your Express Office address. If there is no Railway Express Agency in your town, determine the location of the one nearest you in another town, and notify us of the address of this agency *in advance*.

————— n r i —————

## DO NOT SEND CASH THROUGH THE MAILS

— — — except by registered letter. The Institute cannot accept responsibility for lost remittances sent in unregistered letters. Make all remittances by money order, check, bank draft, telegraph—in fact, *any* way except by cash in unregistered letters.



# RADIO-TRICIAN

REG. U.S. PAT. OFF.

# Service Sheet

Compiled Solely for Students and Graduates

NATIONAL RADIO INSTITUTE, WASHINGTON, D. C.

## R. C. A.-VICTOR MODEL T5-2

### Alignment Procedure

**I. F. Tuning Adjustments.** There are two I. F. transformers associated in the intermediate amplifier system. Both are tuned by accessible trimmers. To obtain correct alignment:

(a) Short-circuit antenna and ground terminals. Tune receiver so no signal is received. Set volume control to maximum. Ground receiver.

(b) Connect output of test oscillator between first detector control grid and chassis ground. Attach an indicating meter to speaker circuit.

(c) Place external oscillator at 460 kc. Adjust output so a slight registration occurs on output indicator. Output should be set at as low a value as will give a convenient indication during adjustment; this is important for the AVC action is voided by such a method. Adjust trimmers, C-49, C-48, C-18 and C-17 in order, for maximum receiver output.

**R. F. and Oscillator Adjustments.** Three trimmers are provided, two for adjustment at 1720 kc. and one for oscillator line-up at 600 kc. No adjustments are required on medium wave band.

Locations of trimmers are shown on Fig. 1. Adjust them as follows:

(a) Connect output of the modulated full range oscillator to antenna and ground terminals of receiver. Check position of dial pointer. It should set exactly on radial line, adjacent to dial reading of 540 when tuning capacitor plates are at full mesh. After correcting dial pointer, place receiver in operation. Set selector at 1720 kc., advance volume control to maximum and turn range switch to broadcast position.

(b) Adjust frequency of the external oscillator to 1720 kc. and regulate output until perceptible indication appears on output indicator. Hold indication at minimum. Then tune trimmers C44 and C45 to point giving peak receiver output.

(c) Return test oscillator, setting its frequency to 600 kc. Turn receiver selector control to point where incoming oscillator signal is received best. This point will not always be exactly 600 on dial. Then adjust low-frequency trimmer, C40, simultaneously rocking tuning capacitor slowly through the signal until maximum receiver output results from these combined operations. Make this adjustment irrespective of dial calibration. Repeat the 1720 kc. adjustment of oscillator trimmer C44 to correct for change caused by tuning of C40.

**Wave Trap Adjustment.** Operate receiver, using normal antenna. Tune to point where intermediate-wave interference is most intense. Then adjust wave-trap trimmer to point which causes maximum suppression of interference. If no interference is present the adjustment need not be made.

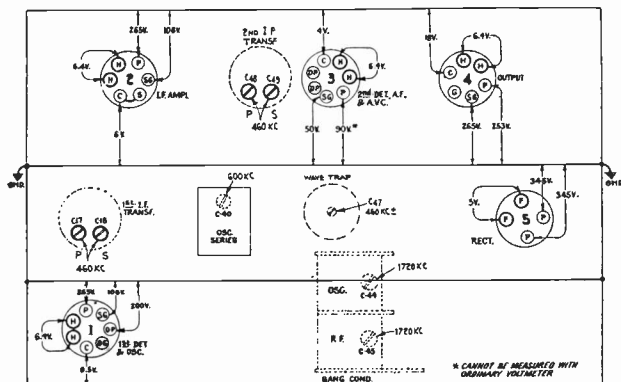


Fig. 1

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



# The Philosophy of Servicing

By Joseph Kaufman  
N. R. I. Director of Education

## There Is a Right Approach

Yes, it is true that behind the technique of Radio servicing are certain natural laws and principles which, if understood, will greatly improve a man's chance for speedy success. N. R. I. has pioneered in teaching this philosophy of servicing — a philosophy now accepted by energetic and progressive servicemen in a form which they call modern servicing. Every N. R. I. student is compelled to think about the matter — every lesson contains information demanded by this philosophy—with the result that the graduate Radio-Trician approaches his life's work equipped to handle servicing jobs *rapidly, efficiently and correctly.*

## Now It Can Be Told

The modern philosophy of servicing came into being several years ago, at a time when the tuned R. F. receiver was just fading out of the picture; superheterodyne circuits were all the rage, and were becoming more and more of a mystery to the "jack-of-all-trades" servicemen of the time. Every week brought forth a new tube, and every new tube made another batch of socket analyzers and tube checkers obsolete. Special and freak circuits further upset the "apple cart" for any serviceman who lagged the least bit behind.

About this time, when the Radio servicing industry was in chaos, Mr. Herr of the Philco Radio and Television Corporation and the writer worked out at National Radio Institute the first modern set tester, then known as "Philco and N. R. I. 048 All Purpose Tester." All this contained was a service signal generator and a multimeter; although these two things then seemed totally inadequate, time proved they were the two most essential servicing instruments.

A few months later the writer, in cooperation with the Triplett Electrical Instrument Company, designed the "Perpetual Tester," essentially the same instrument, but intended to sell at a more moderate price. From that time on, the technique of servicing Radio jobs took on its modern aspects. The change had to come, regardless of who took the initial steps; well-informed Radio men had already been thinking in the direction taken.

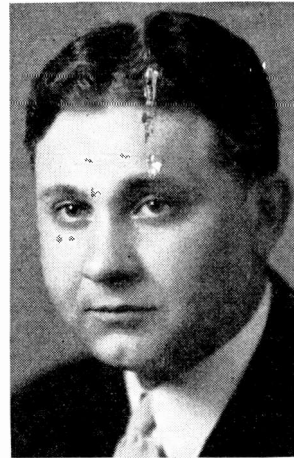
At N. R. I. these rapid advances in the field of Radio compelled us to stop and think before we wrote—to develop for our students a new technique of servicing—one which would prepare them for Radio problems of the future as well as the present. The writing of these servicing lessons made it clear to me that the service oscillator and the multimeter were the basic instruments for all servicemen. Again N. R. I. pioneered in instruction, and today, in every corner of the world, thousands of graduate Radio-Tricians attest to the value of this N. R. I. technique of servicing.

## Servicing Has the Same Earmarks in Any Field

The correct approach to any problem always seems obvious once it is known; if you are able to apply these obvious procedures yourself, you are on the right road. In working out the philosophy of servicing, I compared the Radio man's problems with those of other professional men. My doctor was constantly in my mind. Doctors, you know, are trained to be good diagnosticians—a "million dollar word" for good analyzers.

Go to a doctor with some ailment: he will greet you warmly (good business), ask you what's wrong (you say to yourself, "that's what I came to find out"), ask a lot of questions (they seem silly at first), then start to look you over (getting down to business now). He listens to your heart, looks into your throat and eyes, feels your pulse, and perhaps begins to use special instruments (not to impress you, but to get the real lowdown). All this time he is thinking, reasoning, studying and checking; finally he gives you comforting words (which you really like), sound advice and naturally a prescription (to assist nature in restoring your health). He has given you a remedy.

Unbelievable though it seems, this is exactly



the way a modern serviceman should investigate and repair a "sick" Radio receiver. To prove this, let me show you how a modern Radio doctor (I will take the role myself for the sake of illustration) would handle a Radio receiver "SOS."

Rrrrr—ing—I push the button down at the door of Mr. Brown, who had phoned from his office asking me to call as soon as possible. The door opens, and I say: "Good afternoon, Mrs. Brown. Isn't it a fine day?" (Comments on the weather are always good business.)

"What seems to be wrong with your Radio?" I ask Mrs. Brown as she blocks my way to the receiver. Perhaps Mrs. Brown, too, is thinking: "That's what you are here for." but I have a good reason for asking this question. Mrs. Brown and her husband undoubtedly have come to

some agreement about the trouble, and as a good business man, I am at least going to cure what they think is the trouble.

I listen respectfully to a history of the Radio and its troubles, then tactfully dodge Mrs. Brown to get to the receiver. Click—on goes the power switch—and I wait for the first gurgling greetings from the sick set. If the tube warming-up noises are normal and no other aggravating sounds are heard, I try to tune in a local broadcasting station. Perhaps I get it, perhaps I don't, but now my mind is working at "top speed." If there are interfering noises after the set gets into action, I ask myself: "WHAT COULD PRODUCE THEM?" If the set is completely "dead" I poke my head into the rear of the cabinet to see if all the tubes light. If the set has metal tubes, I gingerly touch each (sometimes this "temperature-taking" proves painful if I am too slow), then check to see that tube cap connections are in place, aerial and ground connected, and the set plugged into the wall socket properly. My eyes trace the antenna and ground wires out of the window to see if they are still in existence. I am "surveying" for obvious defects—physical defects.

Now I begin to "do things" if the set does not play, pulling tubes out of their sockets and pushing them in again while listening for telltale clicks in the loudspeaker. Down the line I go—if I find a tube that won't "click," the chances are ten to one that I have located the trouble-making stage.

By now Mrs. Brown is undoubtedly wondering why I haven't opened the pretty leather case I've deposited on the floor—but I know better. Why use special testing tools when I know from experience that in ninety per cent of the cases my preliminary observations will tell me exactly what is wrong, or at least isolate the trouble to a particular part of the Radio? Why check the entire receiver with instruments, stage by stage, when that little "tube pulling" test will locate the bad stage?

Now I open the little bag and lay out the instruments on the floor, to check my preliminary tests and make a more thorough analysis of the suspected stage. My signal generator replaces the local broadcasting station, and the multimeter gives a check on each and every part. Once the open, the short, or the defective part is spotted, the remedy is simple—I solder the open, remove the short, or replace the defective part (something which our good friend the physician cannot always do.)

Instead of advice I complete my job by tightening up the chassis, checking all tubes, cleaning out the tuning condensers and even polishing the cabinet. If Mrs. Brown can afford a little extra expense, I realign the stages too.

If the receiver is seriously ill, I take it to my hospital, the shop work-bench, for a major operation from which the ailing set emerges a healthy Radio receiver.

Now do you agree with me that there is a correct approach to any Radio servicing job? Here are the eight steps:

1. Confirmation of the complaint—getting the "lowdown."
2. Letting the receiver "speak for itself."
3. Checking for surface defects—no job for a sleepy man!
4. Reasoning from effect to cause—calls for a clear, well-trained mind.

(Page 18, please)



## Radio Operators' Manual

A 64-page booklet, written primarily to assist policemen who desire to become Radio operators, but of interest to all intending to become operators of broadcast stations, has been published by the General Electric Company. Entitled "Police Radio Operators' Manual," and designated as Publication GEB-100, it has been made available by the company's Radio Department at Schenectady, N. Y., at a small charge.

The majority of the material in the booklet is included in a section devoted to questions and answers under subheads entitled "Radio-telephone Transmitters," "Receivers," "General Principles of Electricity," "Operation and Care of Storage Batteries," "Power Supply Apparatus," and "Radio Communication Laws and Regulations." The questions are typical of the ones asked in examinations for first-class Radio-telephone operators' licenses. Additional material is included in two other sections of the booklet—one devoted to general information on police Radio systems, and the other to supplementary information on licenses and examinations.

## The Philosophy of Servicing

(Continued from page 17)

5. Checking stages by tube click test (if set is dead.)
6. Applying modern instruments to isolate the defect.
7. Making necessary repairs.
8. Putting original pep back into the Radio. Only after going through this procedure can I say "that will be four dollars and seventy-five cents," or whatever I estimate that the job is worth.

To handle correctly any Radio job that may come your way, you must know Radio "inside out" and "outside in"—and that calls for real study on real lessons such as N. R. I. gives to you.

Dear Editor:

The NEWS is one fine little magazine. The article entitled "Inexpensive Test Panel," in the February-March issue, certainly made a hit with me, due to the little expense in its construction and the varied uses that can be made of it. Let's have more articles like this for the fellow who wants to get started with little capital. The service information is a big help.

H. R. LITTLEFIELD, Jr.,  
Port Angeles, Wash.

## Take Your Pick

The Editor,  
NATIONAL RADIO NEWS.

Dear Sir:

This is my answer to Mr. Allen Hayworth's question in the Mailbag, February-March issue, 1936.

A Radio serviceman will have all he can do to repair Radios. I do not approve of any serviceman having a display room for new sets. A serviceman who looks after his service business in the correct manner, should not have to sell new Radios.

As for repairing electrical appliances, this work belongs to the electrician. A good Radio-Trician will stick to repairing Radios.

Should he try to sell sets and repair electrical appliances, he will find in time that it does not pay. He will have to neglect his Radio service work in order to take care of the other lines.

Yours truly,  
HARRY D. DUDICHUM, Jr.,  
Pitman, N. J.

The Editor,  
NATIONAL RADIO NEWS.

Dear Sir:

I would say by all means have a side line of repairing electrical equipment and selling receivers, not only because of the extra money to be made, but also because of the valuable contacts made. All are potential future customers for Radio work, and by repairing, say, an electric toaster for a customer, you have gained an entree for his patronage in future trouble, whether it be Radio work or more appliance work.

Cordially yours,  
RICHARD L. McKEE,  
Boston, Mass.

## Short-Wave Field Has New Problem

As if the short-wave field were not already beset with enough sources of interference, another one has been discovered. This time it is electric light bulbs, and the trouble is very widespread. Many lamps in which no defect is apparent nevertheless set up Barkausen oscillations at 30 to 60 megacycles.

These oscillations are set up within the lamp filament itself, independent of the more common source of interference, poor connections and loose sockets. It has been found Japanese lamps are especially likely to set up such oscillations.

## ANOTHER ONE CONVINCED

About January of last year, Student Leon Stilwell was "thinking about" joining N. R. I. so he wrote an N. R. I. graduate and booster, L. T. Newell, for his opinion of N. R. I. Training. Although we have no record of Student Stilwell's letter of inquiry or Graduate Newell's reply, we believe you will be interested in the following exchange of correspondence between these two N. R. I. men:

1206 Holly Street,  
Blytheville, Ark.,  
Feb. 3, 1936

Mr. L. T. Newell,  
Airway Radio Station,  
Elmira, N. Y.

Dear Mr. Newell:

Do you remember me? Well, I'll tell you. If you remember, I wrote to you a year ago about the merits of N. R. I. I write you now for another purpose. That purpose is to thank you again and again for the kind information and encouragement you gave me then.

I thought I owed you this letter, telling you how well I've progressed. This is the story . . . I couldn't make up my mind that I wanted to take N. R. I. Training for almost ten months, but I finally did in November, thanks to you. Although I have not had as much time to study as I would like, I am now on my ninth lesson; have "doctored" two sets, and have another to fix. N. R. I. is even more than you described!

I'll never forget your kindness and I wish you all the happiness in the world in your life's work.

Sincerely your fellow N. R. I. student,

LEON STILWELL.

Graduate Newell's reply to the above was as follows:

U. S. Airway Radio Station,  
R. F. D. No. 1, Elmira, N. Y.,  
February 7, 1936

Mr. Leon Stilwell,  
Blytheville, Ark.

Dear Mr. Stilwell:

Many thanks for your letter of February 3rd, relative to our previous correspondence about the National Radio Institute.

It is my pleasure to receive inquiries about N. R. I. from prospective students quite often, but it is seldom that I hear anything further from them. I sincerely appreciate your letter, and am happy to know that I helped to influence you toward the proper training for a Radio career by the best equipped school for home study of this subject.

In closing, let me wish you all kinds of success in your chosen field of endeavor.

Sincerely,  
L. T. NEWELL,  
Operator in Charge.

Mr. Smith, upon Graduate Newell's acquainting him with the above correspondence, asked Student Stilwell's permission to reprint his letter because he, Mr. Smith, felt that the message contained therein "— would prove a real source of inspiration to other N. R. I. students who are just beginning." Student Stilwell gladly gave his permission and expressed the hope that his letter would encourage other students as much as Graduate Newell's encouraged him.

## How Does the Picture Look

. . . for the Radio Salesman and Serviceman?

According to a recent survey, there are, in round figures, 31,000,000 homes in the United States. Of these there are, roughly:

22,500,000 homes with Radio receivers  
8,400,000 homes without Radio receivers

It is the second classification, "8,400,000 homes without receivers," that is of special interest to the Radio salesman. Breaking these figures down, it means that about one out of every four homes—taking the country as a whole—is a prospect for the sale of a set.

How about the homes *with* receivers? Investigation has shown that out of every *seven* receivers now in use:

1 is one year old or less  
1 is two years old

1 is three years old  
1 is four years old  
1 is five years old  
2 are six years old or older

Thus, the homes with receivers offer plenty of opportunity to both the salesman and the serviceman. Homes with the older receivers are prospects for modern, up-to-date sets; those with receivers of more recent make constitute a rich market for repairs and service necessary to put the receivers in A-1 condition and keep them that way.

The Radio man who is both salesman and serviceman, has double opportunity. He benefits either way—gets the business both "coming and going."





# RADIO-TRICIAN

REG. U. S. PAT. OFF.

# Service Sheet

Compiled Solely for Students and Graduates

NATIONAL RADIO INSTITUTE, WASHINGTON, D. C.

## R. C. A.-VICTOR MODEL T6-9

### Alignment Procedure

**I. F. Trimmer Adjustment.** The location of the four I. F. trimmers is shown in Fig. 1. Each trimmer must be aligned to a frequency of 460 kc. Attach the output indicator across the voice coil or across the output transformer primary. Connect output of test oscillator between control grid of the RCA-6A8 and chassis-ground. Tune oscillator to 460 kc. Advance receiver volume control to its full-on position and adjust receiver tuning control to a point within its range where no interference is encountered either from local broadcast stations or from the heterodyne oscillator. Increase output of test oscillator until a slight indication is present on output indicator. Then adjust two trimmers of second I. F. transformer to produce maximum (peak) indicated receiver output. Then adjust two trimmers of first I. F. transformer for maximum (peak) receiver output as shown by indicating device. During these adjustments, regulate test oscillator output so that the indication is always as low as possible. By doing so, broadness of tuning due to AVC will be avoided. It is advisable to repeat adjustment of all I. F. trimmers to

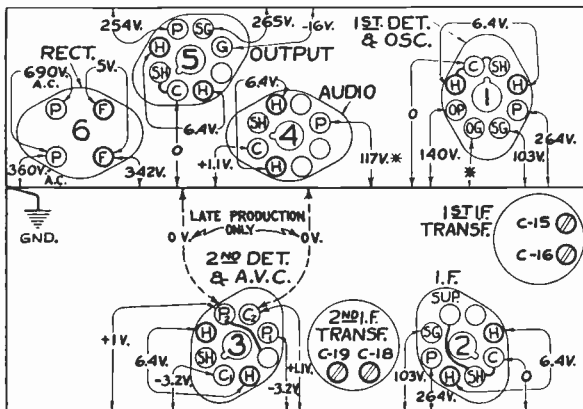
assure that interaction between them has not disturbed original adjustment.

**R. F. Trimmer Adjustment.** Calibrate tuning dial by setting pointer to horizontal line at low frequency end of broadcast band scale while variable condenser is at maximum capacity.

The output indicator should be left connected to output system. Attach output of test oscillator between antenna and ground terminals of receiver input. Adjust oscillator to 1720 kc. and set receiver tuning control to a dial reading of 1720 kc. Leave volume control of receiver at its maximum position. Make sure that range selector is at its broadcast position. Regulate output of test oscillator until a slight indication is perceptible at receiver output. Adjust two trimmers of oscillator and antenna transformer coils (mounted on the variable condenser) so that each produces maximum (peak) receiver output. After this maximum has been accurately obtained, shift test oscillator to 600 kc. Tune receiver to pick up this signal, disregarding dial reading at which it is best received. Then adjust receiver oscillator series trimmer, simultaneously rocking tuning control backward and forward through the signal until maximum receiver output results from these combined operations. The adjustment of 1720 kc. should then be repeated to correct for any change caused by oscillator series trimmer adjustment.

### Wave-Trap Adjustment.

With receiver in operation using normal antenna, tune station selector to point at which intermediate frequency interference is most intense. Then adjust wave-trap trimmer to point which causes maximum suppression of interference. If no interference is present, omit the adjustment.



(\*) CANNOT BE MEASURED WITH ORDINARY VOLTMETER

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

# R.C.A.-Victor Model T6-9

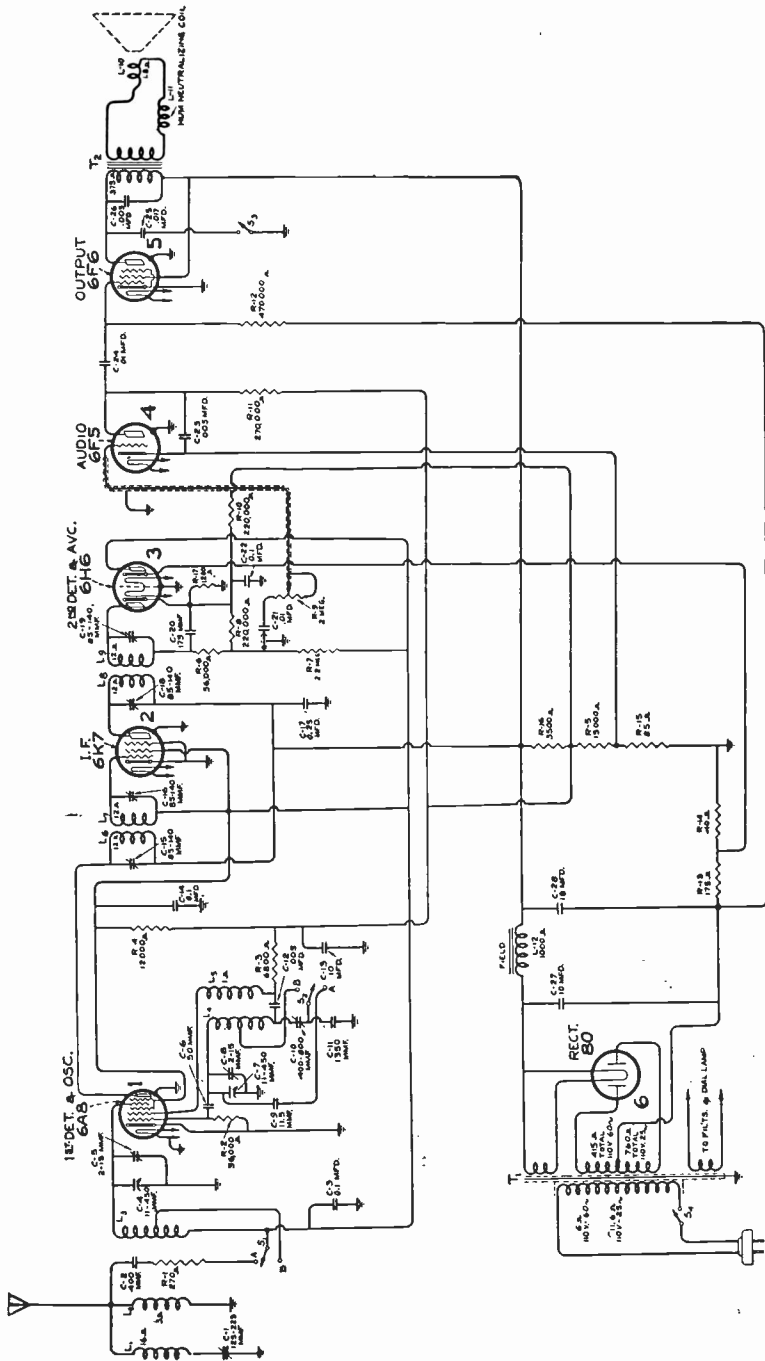


Figure 2. Schematic Circuit Diagram

On some instruments, R-10, R-17, and C-22, are omitted and the RCA-6H6 first Cathode is directly grounded.

# N. R. I. ALUMNI News

## Philadelphia-Camden Chapter's Cooperative Service Plan

By Clarence Stokes, Vice-President, N. R. I. A. A.

If there ever were any truth in the maxim "In unity there is strength," it is being proved here at the Philadelphia-Camden Chapter. The recent development of the Philcam Radio Sales and Service organized for the benefit of our members, gives us all a chance to make more money in the Radio servicing profession.

Cooperation is the keynote of our successful operation, and only members of the Alumni Association can take part in this progressive movement. Every member is giving his whole-hearted support, and we will soon be literally *cleaning up* on the Radio service business in this territory. Many of the details remain to be worked out, but we have definitely decided on one point: All profits will be equally divided among the members in proportion to the amount they have invested, similar to any corporation proposition.

Our service station has all the appearances of a first-class Radio store. A competent N. R. I. Radio serviceman is at all times ready to render service and take care of work brought into the store. We plan to have as modern and complete testing equipment as possible. We have available for use at this time a Model OC Clough-Brengle AC operated all-wave oscillator; a No. 1200 Triplett Universal Tester for checking DC and AC voltage, DC current and resistance; and a No. 630 Readrite portable tube checker with Triplett meter, capable of testing all tubes—including the metal types. An 89C model Supreme tube checker, is also available.

We are arranging to carry a complete line of Radios, replacement parts. Radio receiving sets, accessories for repairing all types of Radios, and various other appliances and parts. We now have on hand

a complete line of Sylvania tubes, condensers, resistors and volume controls, pilot lamps and miscellaneous parts, several new receivers, a stock of G. E. lamps, and miscellaneous vacuum cleaner repair parts.

To operate and promote the service business, we will endeavor to obtain business through direct mail, newspaper, and other important forms of advertising. Work brought into the store will be handled by the serviceman on duty, but requests for service elsewhere will be turned over to the member located nearest the customer. Members not in a position to render complete service of their own, can bring their work here and receive direct compensation for doing it. "Dealer service" will be rendered for \$1.50, plus parts at the regular discount. This is available to regular N. R. I. A. A. members, free . . . . permitting students and graduates to immediately render satisfactory and guaranteed service on any work they obtain. Later, an additional service bench will be installed for members, where they can do their own service

(Page 22, please)



Philcam Cooperative Shop

## Alumni News

(Continued from page 21)

work in the shop, subject to a nominal charge for overhead.

The N. R. I. A. A. Philadelphia-Camden Headquarters is also located here, and meetings are held in the room in the rear of the store. It is intended to install a student service bench in this room. In view of the fact that one of the primary reasons for establishing the Philcam Radio Sales and Service was to have a regular headquarters for the N. R. I. A. A. Chapter, it is to the advantage of the whole Chapter to push Philcam, because its success indirectly benefits the Chapter and members. Any equipment the Chapter furnishes the Philcam Radio Sales and Service organization is to the members' advantage and it is for the use of all N. R. I. members who join in with this movement.

The officers of the Philcam Radio Sales and Service consist of the following:

Charles J. Fehn, President

Allen Schiavoni, Secretary

Clarence W. Stokes, Treasurer

The Board of Directors includes Bernard Camm, John Marshall, Philip J. Walsh, Alfred Fish—others to be appointed.

N. R. I. students, graduates or Chapter members interested in this "cooperative plan" and desiring more information, address a letter or postcard to Allen Schiavoni, Secretary, at Headquarters, 2433 Kensington Avenue, Philadelphia, Pa., or better still, call personally and talk things over. It may be the turning point in your Radio career.

— n r i —

"The Radio-Trician is a vital and integral part of the Radio Industry and while much has been done toward organizing that group, any and all efforts toward unification and organization to elevate the standards of the field are highly commendable."

J. GEARTNER,  
Promotion Manager,  
Arcturus Tube Co.,  
Newark, N. J.

— n r i —

*The Alumni needs more men, not merely to reap the fruits of fraternalism, but to nourish the tree.*

## St. Louis Wants New Chapter

Mr. Edward Myers, Vice-President of the N. R. I. A. A., is keenly interested in establishing a local unit of the Alumni Association in St. Louis, Missouri.

National Headquarters is endeavoring to cooperate with Mr. Myers in the project, and any N. R. I. men living in St. Louis or vicinity are urged to get in touch with Mr. Myers by telephoning him at Riverside 0451-M, or writing him at his home, 4517 Alaska Avenue, St. Louis, Missouri. Let's get together, fellows, and give him our cooperation!

## Baltimore Chapter

"The desire for a new meeting headquarters has been increasing to such an extent, that we believe we'll soon be able to move 'bag and baggage' to the New Howard Hotel here in Baltimore," reports W. Giese, Editor of the Baltimore *Bulletin*. "This hotel is centrally located and is within easy reach of everyone. In all probability we will use the main ballroom, which has a seating capacity of about two hundred. The final arrangements should be made within the next two or three weeks."

Our new Chairman, Mr. E. O. E. Gralley, is turning things topsy-turvy these days—in the right direction, of course. It is not an easy job to assume leadership of a large Local Chapter, but we have to take our hats off to friend Gralley, as he is proving to be a leader of the go-getter type. Don't let anyone tell you that Gralley doesn't know his *Parliamentary Larc*. We doubt very seriously if many of those gentlemen over in England could teach him much about the subject. Meetings are conducted according to "Hoyle," and Gralley is out to give every man a "break" when he gets on the floor to speak. We understand confidentially that our Executive Secretary, "Bob" Murray, is getting quite a few pointers as he has been making appearances here frequently of late.

Vice-Chairman Jensen, Secretary-Treasurer Willett, and other new officers are helping to make the "music go 'round and 'round" and we are happy to report they are doing a swell job of it. These fellows are on their toes all of the time and the members have no regrets regarding their choice of officers to serve during 1936.

Our National President, "Pete" Dunn, appears to be getting quite a *kick* sitting behind the lines watching the other boys do their stuff. It was with a great deal of regret that "Pete" relinquished his position as Chairman of the Baltimore Chapter, but we all know he has his hands full as National President. We feel very

honored here at Baltimore to have such a swell National President and a Local member of our Chapter. He's the kind of fellow you only have to meet once to know that he is your friend.

The Publicity Committee is working hard to get new speakers lined up for future meetings. Mr. Olmstead is in charge of this work, and recently visited National Headquarters and outlined his plans. Our Executive Secretary is preparing a list of Radio organizations which may be contacted with the view of providing speakers at later meetings. We know that this fellow Olmstead has the *pep* to put things over.

— n r i —

## Detroit Chapter

Mr. Percy Barlow, Chairman, reports that the Detroit Chapter's last meeting went over with a "bang." The entire evening was timed so that two speakers could be put on the same program. Mr. Resie, first speaker of the evening, who is local distributor for Clough-Bringle testing equipment, located at 5051 Hamilton Avenue, Detroit, gave "the boys" plenty to think about. He described the modern trend in Radio servicing work; how good equipment cuts down servicing time; and demonstrated how efficient receiver checking can help to increase the Radio-Trician's profits. Mr. Resie's practical demonstration of the oscillograph when used with the oscillator and modulator, and the use of an audio oscillator when employed in public address work were well received.

Mr. Moore, Preceptor tester representative, later went to some length in explaining efficient tube analyzing. While it is the general opinion of our members that all Radio troubles will never be done in a "jiffy," we hope to cut down our present servicing time, thereby lowering our costs.

Members showed their appreciation and interest by closely following Mr. Moore, who took Radio tubes and traced the uses in circuits, including the eight element tube and demonstrated how it should be checked.

Here in Detroit, it has been our experience that the fellows are particularly interested in the testing technique. We want our members to *keep pace* with Radio manufacturers, and not be left two or three years behind their developments.

The full two and a half hour program gave both Mr. Resie and Mr. Moore full play to their knowledge of testing technique. The Detroit Chapter owes them a great deal, and we are taking this opportunity of expressing our thanks through the *News*.

Any student or graduate living in Detroit, who would like to take part in Chapter activities, may receive full information about our meeting dates by writing to Mr. F. E. Oliver, Secretary, 218 Alter Rd., Detroit, Michigan.



## New York-Metropolitan Area Chapter

A general rally was the order of the evening at our last meeting in the Hotel New Yorker. We are endeavoring to get the full support of Alumni members in the New York area to put our new program over in a *big way*.

We have made some changes in the officers, and the following is a revised list:

Allen Arndt, Chairman  
Joseph Holub, Vice Chairman  
John Struble, Financial Secretary  
Thomas Köhrherr, Recording Secretary  
Louis J. Kunert, Membership Secretary

The Chairman reports, "We have contacted a service engineer to run a series of articles in our Chapter *Tattler*, showing how to figure out all the circuits, the values, etc. In this way, our members will be gaining a service engineer's knowledge on the subject, and the how and why of the formulas given in the N. R. I. Course. They will be able to take a pencil and paper and figure out the various values for all the parts that show no values, and the circuit for which there are no diagrams. In addition, we are endeavoring to offer quite a few service hints, business hints, I. F. peaks and much more that will be beneficial to the Radio-Trician."

So come on, you fellows in New York City and the vicinity, get together and give your support to helping the New York Chapter carry out its ambitious program. Any student or graduate living in reach of the New York Chapter are urged to write Mr. Louis J. Kunert, Membership Secretary, 66-11 74th St., Little Village, L. I., N. Y.

— n r i —

I want to take this opportunity to thank the Alumni Association for their splendid services to N. R. I. graduates.

To keep up-to-date in Radio, I make constant use of the Alumni Consultation Service, N. R. I. News, and the bi-monthly meetings of the Baltimore Chapter. Here I can always learn new ways of doing my service work, which are extremely valuable in increasing my Radio income.

Your latest folder came to me describing the new 10-point Alumni plan—I know that everyone like myself will want to profit by this remarkable service.

OLIVER J. RUTH, Jr.,  
Baltimore, Md.

(Alumni News continued on page 29)



## C. S. MORTON

also studied law for two years and completed a two-year course in accountancy.

Moving to Chicago, Morton became associated with LaSalle Extension University and was later promoted to Assistant Student Service Manager, a position he held for five years. He then joined the International Accountants' Society as Student Service Manager, and after four years, left to plan and supervise the preparation of an extension course for the Milwaukee School of Engineering. Upon the completion of this work, he accepted the position of General Manager of the Syracuse Extension Institute, and remained with this organization for three years.

You will see, from this brief introduction, that Charles S. Morton comes to N. R. I. well equipped to serve its students and graduates, and the Editor of the News feels sure that he has the best wishes of all N. R. I. men for a long and successful career as a member of the N. R. I. Staff.

**M**EET Charles S. Morton. Although a new member of the Publicity Department of the N. R. I. Staff, Morton comes to N. R. I. with a rich and varied experience gained through years of association with the home study field.

Born in Tucson, Arizona, and receiving his grade school education there, Morton later went to school in Chattanooga, Tennessee, and graduated from the McCallie School, Missionary Ridge. In addition to this general education, he

# Introducing Two New Members of the N. R. I. Staff

**M**R. L. J. MARKUS is a newcomer in the East, having lived in Minnesota for 23 years. Graduated from the University of Minnesota (in 1933) with the degree of Bachelor of Science in Electrical Engineering (B.S.E.E.), specializing in Radio and Electronics. Was managing editor of the Minnesota Techno-Log, while in college. His scholastic honors include membership in Tau Beta Pi, honorary engineering fraternity, and Eta Kappa Nu, honorary electrical engineering fraternity.

After graduation he went into the engineering department of a Minneapolis manufacturer of heat regulating equipment (Minneapolis-Honeywell Regulator Co.) and carried out research work on Electronic control equipment. While there he built a cathode ray oscillograph to be used in making magnetic tests.

Going back into engineering journalism, his college hobby, Markus held the position of Associate Editor on the staff of *Modern Mechanics and Inventions Magazine* for two years before coming to N. R. I. Duties on the magazine in-

cluded editing and rewriting of all Radio and workshop material, answering of questions sent in by readers on different subjects, and supervising of the blueprint service department.

At the National Radio Institute he holds the position of Associate Technical Writer, working directly under Mr. Joseph Kaufman, N. R. I.'s Supervisor of Education.

Mr. Markus has promised to cooperate with your Editor and is now preparing an article for a forthcoming issue of NATIONAL RADIO NEWS.

L. J. MARKUS



# NATIONAL



# RADIO NEWS



FROM N. R. I. TRAINING HEADQUARTERS

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No. 2

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P. J. MURRAY, MANAGING EDITOR

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## Wet Electrolytics

An ingenious vent, in combination with a rugged unit construction for anode and stem support, is featured in Aerovox wet electrolytic condensers recently made available to the general trade. The same units had previously been available to manufacturers.

Instead of a bit of gauze for venting purposes, which arrangement generally fails to prevent seepage of liquid electrolyte and subsequent corrosion of condenser and chassis components, Aerovox "wets" are provided with a double-sealed vent. Any gas pressure built up within the can escapes through a pinhole in a soft rubber diaphragm and through offset holes in the dome cap. However, if electrolyte presses against the diaphragm, the latter instantly presses against the offset holes in the dome, sealing same securely. There can be no seepage or corrosion.



Another distinctive feature is the unit anode and stem construction. A three-wing (instead of usual two-wing) anode is mounted on a rugged stem spun-riveted to the hard-rubber cap fitting into bottom of can. The can edge is spun over on to a soft-rubber gasket and the cap, forming a leak-proof seal. This is in contrast to a stem pinched in a rubber-bushed crimped can bottom. The unit construction permits permanent and positive centering in can, lower power factor and absolute uniformity of these "wets."

Usual advantages such as high capacity for minimum bulk, ability to take severe punishment, self-healing and low cost, are retained in these new units now offered by Aerovox Corporation, Brooklyn, N. Y.

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## Turning the Tables

Artemus Ward used to tell of the Living Skeleton he hired for a tour through Australia. As soon as they left the American port the unbelievably thin specimen began to eat a little, and each day to eat a little more. By the time they put on their first show in Melbourne, the Skeleton weighed 64 pounds more than Artemus. Business got so bad that financial ruin loomed ahead.

Coming back to California the Skeleton kept on eating, and the hopes of Artemus Ward began to rise. By the time they reached San Francisco Artemus had decided to exhibit his specimen as a Fat Man.

Why not turn your stumbling-blocks into stepping-stones? There is a way, if you will only search for it until you find it.



## Toronto Chapter

"Old Man Winter" has given us a full share of his icy breath up here in Canada, but we are managing to conduct our regular Radio work and attend meetings of the Chapter. I guess the fellows *can take it*.

Our Local Secretary, Mr. Ed Witherstone is working in high gear to improve the "Canadian Radio-Trician" bulletin. Another issue should be

out shortly, and we hope all the fellows on our mailing list will be well pleased. "Ed" deserves a lot of credit for giving up many of his hours of pleasure to do a fine job of our Local Chapter paper.

How many of our members operate a transmitter? We know of one member on the 3.5 m.c. band. He is H. D. McLean, VE3QW, 1288 St. Clair Ave., Toronto. How many more VEs have we in our Local? We'll be glad to have a report on this next meeting.

Our new Chairman, A. Stollard, is taking to his new job like a "duck to water." He appears to be keeping the boys intensely interested by arranging for them some very fine talks and discussions that will help them become better Radio men.

A short time ago "Ed" Witherstone opened a new store at 1884 Yonge St., Toronto, under the name of "Imperial Radio Service" and "Fada Radio Service Supply." The firm will handle Radio sales and service and will be the only place in the Dominion where parts for Fada Radios may be obtained. Members visiting Toronto are welcome to drop in at any time for a chat.

Canadian N. R. I. men are urged to write E. Witherstone, 363 Nairn Avenue, Toronto, for information about the Toronto Chapter's out-of-town service.

— n r i —

## Merryman Re-elected for Sixth Term

Probably no other Alumni officer can compete with Earl Merryman's record for length of service. He has been associated with the Alumni as Secretary for the past six years.

A short time ago, "Earl" called the Executive Secretary on the phone, and expressed his appreciation of the members' confidence by re-electing him as an officer for 1936. In short, he stated: "The 'gang' can depend on me to do my very best, and it sure makes a fellow feel good to know they are with you *all the way*."

Thanks, "Earl," and, we all hope you are re-elected next year . . .

## Directory of Chapters

At the request of readers we will continue to publish a list of the Local Chapters and the addresses of the officers to whom N. R. I. men may write for information on Chapter programs.

The following is a revised list:

Baltimore—J. A. Willett, Secretary, 2411 Arundel Ave., Baltimore, Md.

Philadelphia-Camden—Clarence Stokes, Secretary, 2947 Rutledge St., Philadelphia, Pa.

New York—Allen Arndt, Chairman, 183 Avenue C, Apt. 6, New York City.

Buffalo—T. J. Telaak, Chairman, 657 Broadway, Buffalo, N. Y.

Toronto—Ed. Witherstone, Secretary, 363 Nairn Ave., Toronto, Ont., Canada.

Chicago,—Samuel Juricek, Secretary, 4223 N. Oakley Ave., Chicago, Illinois.

Pittsburgh—Albert Maus, Secretary, 9 S. Howard Ave., Bellevue, Pa.

Detroit—F. E. Oliver, Secretary, 218 Alter Rd., Detroit, Mich.

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## Notice

Just as this issue of the News was ready to go to press, Percy Barlow, Chairman of the Detroit Chapter, reported: Arrangements were being made by their Chapter to print a local bulletin, similar to those issued by the Baltimore, Philadelphia, New York, Chicago and Toronto Chapters.

This is welcome news! National Headquarters assures the Detroit Chapter they can count on 100% cooperation from Washington to assist in putting this plan "over the top." Local bulletins are the "life" of an active group of men . . . and Alumni members are bound to profit through a local paper which gives a written report on meetings, Radio talks, coming events, editorials, service hints, etc.

Therefore, the Executive Secretary, "Bob" Murray, hereby serves notice on the Detroit Chapter that he will arrange to print the first issue—FREE—and is awaiting the copy to start things in motion. How about it fellows!

J. E. SMITH, Pres.

— n r i —

*So much of a man's life is concerned with making a living that happy is the man whose occupation is congenial. We should all strive to follow more closely the good old advice: "As we journey through life, let us live by the way."*

(Alumni News continued on page 29)



made by the small green 500,000 ohm resistor, to the control grid of the pentode at the grid terminal. (b) Cut the connection made by the No. 67299 .02 mfd. coupling condenser to the corner lug of the terminal strip (this being the same lug to which the other connection of the green resistor is made). (c) Connect loose end of the resistor to the loose end of the .02 condenser; connect the control grid of the pentode to lug on mentioned resistor terminal strip. This change removes the 500,000 ohms from the grid circuit of the pentode tube at the same time retaining the R. F. suppressing action for which the resistor was used. Later production sets already have this change.

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## UNITED MOTORS MOTORBOATING MODEL 2035 AUTO RADIO

This trouble indicates that an open exists in some of the R. F. bypass condensers in the condenser block. If the .25 mfd. condenser in the control grid return of the 1st R. F. opens the tendency is for the set to block while if the .06 mfd. condenser in the grid return of the I. F. tube opens, the set will motor boat. An open in any of the condensers in this block may result in weak signals and oscillations.

————— n r i —————

## UNITED MOTORS MODEL INSTALLATION 2035 AUTO RADIO HINTS

In putting the mounting studs in the receiver case, servicemen have a tendency to screw the stud in far enough so that it strikes the condenser plates. Of course, this will short the plates and render the set inoperative. Do not allow the mounting studs in any instance to enter the receiver case more than  $\frac{1}{4}$  inch.

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## ABOX ELIMINATOR REPLACING ELECTROLYTE

The electrolyte in the Abox eliminator consists of a solution of potassium hydroxide and distilled water, on the surface of which is floated a quantity of mineral oil. To duplicate, dissolve 10½ ounces of C. P. (chemically pure) potassium hydroxide (KOH or caustic potash) in 6 pints of distilled water. (In an emergency this potassium hydroxide can be obtained at any drug store in stick form.) Add  $\frac{1}{2}$  pint of Nujol. It is important that the proper amount of oil be floated on the electrolyte. Do not attempt to operate the eliminator without oil.

## AMRAD MODEL 81

## HUM

Sometimes a persistent hum heard only with a speaker baffle may be isolated in the 1st A. F. stage. It may be eliminated by shortening the leads in the phono switch cable. This is practical when the set owner does not use a phono pickup. If the hum continues with the detector tube removed locate the two green leads in the phono cable and remove the one coming from the condenser block and connect it to the one coming from the input of the 1st A. F. stage making separate hum adjustments for each one. Try moving the speaker back from the front of the cabinet.

————— n r i —————

## AMRAD MODEL 81 VOLUME CONTROL INOPERATIVE

This is caused by a poor connection between the lug on the volume control potentiometer and the chassis. Sometimes the potentiometer circuit will become open at the minimum setting giving intermittent trouble of this kind.

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## GENERAL ELECTRIC INTERMITTENT MODEL T-41 RECEPTION

In most cases, this trouble has been found to be due to dirty contacts between the rotors of the tuning condensers and the chassis.

Cleaning and sandpapering the contacts will not always clear up the trouble. In such a case a pig-tail connection should be soldered to the condenser shaft and the other end attached to one of the screws on the condenser frame.

————— n r i —————

## GENERAL ELECTRIC MODELS WEAK J-80 AND J-85 RECEPTION

Usually this will be accompanied with low plate and screen current on the 47. This condition is difficult to diagnose as the filament, screen and plate voltages are normal and the grid bias is below normal. The latter should be about 10 volts. Actually the grid bias is too high but the low measurement is caused by opening up of the 100,000 ohm resistor which connects to ground and the grid return of the 47. Thus the entire voltage drop across the speaker field is applied to the tube grid through the 500,000 ohm resistor which connects to the 100,000 ohm resistor and the low potential end of the field. This high resistance introduces considerable error in the reading obtained by the average meter. Before final breakdown of the 100,000 ohm resistor the receiver may be intermittent and may hum.

(Page 28, please)

# The Service Forum (Continued from page 27)

## GENERAL ELECTRIC MODEL J-125

## INCREASED SENSITIVITY

Remove the chassis and connect the terminals of the 400 ohm section of the volume control to the chassis. This is the round section of the double unit. While this will improve sensitivity, it can also result in more noise between stations which, of course, is natural with increased sensitivity and opens the way for a noiseless antenna installation.

————— *n r i* —————

## GRAYBAR INTERMITTENT RECEPTION MODEL 678 AND OSCILLATION

This trouble has been found to be repeatedly caused by a defective volume control or corroded condenser clips. A new control should be secured from your distributor. The screen grid section of the new control has a different value than the old one, and has a reversed taper. This necessitates reversal of the two outside connections on the screen potentiometer and removal of the 12,000 ohm gray resistor which shunts the section of the volume control. Before removing the old control, draw yourself a picture diagram showing the position of the wires. This will prevent any difficulty in installing a new control. If a Centralab control, which exactly duplicates the original is obtained, a new 12,000 ohm resistor must be installed and the two outside connections on the screen potentiometer are not to be reversed. Do not be afraid to install this duplicate control, because the original burned out to a defect in the first 12,000 ohm resistor which was employed.

————— *n r i* —————

## GREBE MODEL SK-4 OSCILLATION

Located between rotors of the tuning condensers are 3 contact brakes. Oscillation may be attributed to poor contact at these points. Tightening is suggested. Care should be exercised in tightening the contact brakes. If they are made too tight the tuning wheel will turn exceedingly hard. Brakes should always be tightened so each has equal pressure. In making adjustments to the contact brakes, it is necessary that the condenser cover shield be removed. This is accomplished by loosening the four bolts holding the cover in place, two of which are located at the far end of the six-gang condenser mounting.

## CADET 2-TUBE

## DEAD

When the tube tests all right, this condition has most often been found to be caused by an open 3,000 ohm resistor located under the 12A7 type tube socket. Replace this resistor with one having a higher wattage and the trouble will be solved.

————— *n r i* —————

## RADIOLA MODEL 80

## POOR QUALITY

When the voltages seem to be correct and you know that the receiver is properly band passed, check the primary of the input push-pull transformer. This primary may be open and voltage still be applied to the plate of the 27 detector tube, as the primary is shunted by a 40,000 ohm resistor.

————— *n r i* —————

## RADIOLA MODEL 80 VOLUME CANNOT BE REDUCED ON LOCALS

With a pair of side-cutting pliers, nip off the resistor shunting the volume control. This will enable you to reduce the volume on powerful local stations, but will not materially affect the sensitivity when the volume is advanced.

————— *n r i* —————

## PHILCO MODEL 54C

## DEAD

Be sure to check the 6A7 tube. In most instances you will find an internal short between the screen grid and some other element.

————— *n r i* —————

## GLORITONE MODEL 26

## DEAD

No voltage on any tube. Excessive plate current in rectifier. Check the plate by-pass condenser located in the multiple section by-pass condenser. The plates of the first and second R.F. have the same voltage. The wire connecting both of these plates connects internally (inside the multiple section condenser) to the condenser which in turn is grounded. Connect (1) .5 mfd. 600 W.V. to each of the primary coils to the nearest ground.

## Chicago Chapter



The big election is all over and the new officers installed and functioning. Routine business is out of the way and we are all set for a big year. The officers for 1936 were elected as follows:

Chairman, Earl R. Bennett  
Secretary, Samuel Juricek  
Librarian, C. B. Morehead  
Sergeant-at-Arms, Leo Lewandowski  
Financial Committee, C. Schultz, M. J. Napier  
Publicity Committee, Frank Pesek, C. B. Morehead  
Entertainment Committee, C. St. Clair, Edward Sorg

Speeches from the successful candidates immediately following the election was quite an exciting affair. Chairman Bennett expressed his thanks to the boys for their confidence shown by his re-election.

The members thanked Mr. Kidd in appreciation of his series of lectures before our Chapter. Mr. Kidd, at this meeting gave a brief review of his preceding lecture on A. V. C. and diode reception—this was a humdinger of a talk on squelch circuits and silent tuning. And while we are on the subject let us say to you fellows who weren't present that if you feel you can afford to miss these talks you had better see a brain specialist immediately, because here is a man who really knows his business and has the ability to pass it on to you. He'll be with us again shortly.

Here is a new one for National Headquarters to ponder over. The Chicago Chapter has organized a Chapter orchestra. Accordions, saxophones, violins, guitars, will soon be blaring away. Arrangements are being made to provide a place for rehearsals and notice is hereby served on Wayne King to watch out. And while we are at it, why not have a male chorus? We know there are some good voices in the crowd who attend our meetings, so let's see you fellows with the silver throats give the orchestra some competition. All of you men who play any kind of instrument or can sing, let us know what you have and join in with the rest of the crowd. We anticipate a swell time for everyone.

The Local Chapter publication, *Chicago Chapter Chatter* is getting better every issue. A great deal of the credit goes to our Editor, C. B. Morehead. We believe secretly that Morehead is out to give some of the other Chapters

competition—and is he giving the boys a run for their money!

Now you N. R. I. men who are living in Chicago and the surrounding territory, let's hear from you. Every N. R. I. man is welcome to our meetings and he will find a swell bunch of fellows to welcome him into our midst. Meetings are regularly held at the Sherman Hotel on first and third Fridays of every month.

— n r i —

## Philcam Instruction Classes Progressing

The Thursday instruction meetings of the Philadelphia-Camden Chapter have at last settled down to a definite program. To be of assistance to as many members as possible and at the same time cover as many branches of Radio as practical, it has been decided to divide these evenings into classes as follows:

7:30-8:30—CODE CLASS. This time will be devoted to the sending and receiving of coded messages, under the able leadership of Mr. Al Schiavoni. Due to the particular nature of this class all members desiring to participate are requested to attend the earlier classes in order that there be no delay in working up the speed of sending and receiving.

8:30-9:00—SALESMANSHIP. Demonstrations and discussions on the various methods of selling Radio service will be in order.

9:00-11:00—SERVICE INSTRUCTION. Mr. Fehn is handling this class in the most efficient manner. Various circuits are diagnosed by the professor in such a manner that all of us can understand them. If you have a particular circuit you want explained, or if you have any other problem in the servicing line bring it around and let us thrash it out.

11:00-11:30—MATHEMATICS. This class is conducted for those who wish to brush up on their math.

These classes are available for all members of the National Radio Institute Alumni Association. Members may attend any one or all of the classes. Attendance is voluntary, but cooperation of all members will make for better classes.

— n r i —

## Graduate Wagner Has "Tried Them All"

"There's nothing better than NATIONAL RADIO News, and I've tried them all. I have found more service hints in the N. R. I. News than all the rest of the Radio magazines put together."

E. C. WAGNER, *Punxsutawney, Pa.*

— n r i —

*One hundred percent membership will provide the necessary link to forge the N. R. I. Alumni Association into one of the greatest in this country.*

# Novel Radio Items

—BY L. J. MARKUS—

A new department conducted by L. J. Markus, who was recently made a member of the N. R. I. Staff (see page 24). Mr. Markus' wide experience in engineering journalism has equipped him with an extensive knowledge of odd and entertaining facts and occurrences related to Radio. We hope "Novel Radio Items" will prove popular with our readers.—Editor.

—n r i—

## G-Men Plan Super-Power Radio!

Department of Justice experts are at work on a secret broadcasting system which cannot be "tapped" or heard by any one else than G-men. Experimental work on the super-power short-wave station which may be used is now underway at the Bureau of Standards' Radio Laboratory.



—n r i—

**WANTED: A Radio-Triician** who can invent some less noisy gadget that will replace the taxicab horn. Suggestion: Give each cab driver a 5-meter radiophone set and let them whisper to each other the naughty things they try to make their cab horns say.

—n r i—

## "The Shadow" Is Caught!

"The Shadow," a weirdly whirring Radio signal powerful enough to interfere with short-wave reception in every part of the world, has at last been tracked to its lair. Cathode ray oscillograph pictures showed it to be a 60 cycle frequency on a carrier which wandered aimlessly between 20 and 30 meters. Some said the signals were from another planet and others blamed a scientific crank, but Navy Department Radio engineers at last solved the mystery by tracing the signals to experimental high-power diathermy machines. Who says there is no mystery or adventure in Radio?

—n r i—

## Squeaks Cause Crashes!

Mysterious crashes of a sound effects box in the New York studio of WINS have been traced to music played by a certain violinist. Shortening the legs of the cabinet took the resonant frequency out of the musical range and cured the trouble.

Page Thirty

**THE FELLOW** who thought he could fix anything after glancing through the first two lessons in his Radio Course sends out an SOS for help.

—n r i—



## Seconds Cost Thousands!

The sponsor of Paul Whiteman's orchestra recently spent \$1,200 extra for one night's program simply to eliminate a few seconds pause in switching a program from New York to Hollywood. The money went for a second coast-to-coast telephone wire, the programs flowing in only one direction through each wire.

—n r i—

## "Old Sol" Causes Radio Fading!

Mysteriously and suddenly short-wave Radio signals faded out for 15 minutes on May 12, 1934, as sharply as if all high frequency transmitters had failed. The same fading has occurred approximately every 54 days since that date. Dr. J. H. Dellinger tackled this problem, studied listener reports, then announced that the sudden fading of signals, occurring only during the daytime, was undoubtedly due to some gigantic eruption on the sun's surface.

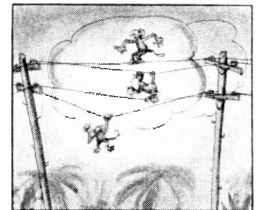
—n r i—

## Amateur Hour Goes to Prison!

Convicts at Joliet "get the gong" every Monday and Wednesday night—they conduct their own amateur hour. Programs are picked up by Radio station WCLS in Joliet and put on the air. Naturally the signature theme of the prison band is "The Prisoner's Song."

—n r i—

**MONKEYS** in Central America, they say, had trouble walking over telegraph wires until one bright ape conceived the idea of looping his tail over the wire above—a sort of trolley pole arrangement!





## New N. R. I. Hams

During the last several weeks we have received notification of the following N. R. I. students and graduates who own and operate Amateur Stations:

- S. A. Redick—WSPDW—Columbus, Ohio.  
Theodore Andras—W8OAD—Highland Park, Mich.  
M. O. Swailes—VE4IV—Moosejaw, Sask.  
H. D. McLean—VE3QW—Toronto, Ont., Canada.  
Geo. Ogishima—W7CRM—Seattle, Wash.  
Nelson Burns—W6LJR—Flagstaff, Ariz.  
A. B. Monroe—W9VBH—Kennett, Mo.  
H. E. Cherry—W8GDE—Gallion, Ohio.

### BOUQUET

Of all Radio magazines I choose yours as the best. It is clear to understand; the writings of the N. R. I. Staff portray their untiring interest in the students and graduates.

JAMES S. HENNINGER, Lubbock, Texas.

— n r i —

## Filing Service Notes

I have seen a lot written in the Mailbag on filing service notes, but none like my system.

It seems that the suggestions were for filing material from one magazine only, but my plan involves filing notes from thirteen different magazines and sources.

Each Radio magazine or source from which I obtain information is given a number, for instance, NATIONAL RADIO NEWS is considered No. 1; *Radio-Craft*, No. 2; *Radio News*, No. 3—etc. These sources of information are filed in my library.

I obtained a loose-leaf binder. The sheets I ruled into columns, headed as follows: *Model*; *Symptoms*; *Magazine No.*; *Issue*; *Page*. One or more (as necessary) of these sheets are headed with the name of a receiver, for instance—Air-line, Bosch, Crosley, Emerson, and filed in the book in alphabetical order.

From my sources of information I fill out these pages—using one line for each case on the page headed for the receiver in question. When I am ready to do a job on a receiver, it is only necessary to turn to the page headed

with the name of that receiver—read down the *Model* column to the number of the receiver on which I'm going to work. Then I look up the references shown beside this *Model* number, as indicated by the three columns headed *Magazine No.*, *Issue*, and *Page*.

On these pages I make use of red ink for telling me when there is a circuit diagram of the particular set available. I leave the *Symptoms* column blank when I have a diagram only—I put in (in red ink) the letter A if I have full instructions—and the letter B (in red ink), when there is an explanation on a new circuit which is rather tricky. The diagrams referred to here are those which are in magazines in such form that it is not convenient to remove them for filing—and for magazines where the instruction material is listed on the reverse side of the Data Sheets.

I do not believe my plan will be acceptable to every Radio serviceman who collects notes—but I do think that it can be adapted, with certain modifications, and be a benefit to all servicemen.

Above I referred to "diagrams which could not be conveniently removed from the magazine." Let me say right here that NATIONAL RADIO NEWS is the only magazine published which has the feature of permitting the removal of the Data Sheets without hurting them or the balance of the book in any way.

ALBERT FABER, Hudsonville, Michigan.

— n r i —

## Frames First Dollar

I just finished my second practical unit today, and also made my first dollar in Radio, which I have framed as a mascot.

JOE MAROSEK, JR., Phoenixville, Pa.

— n r i —

## Joe Rounds Says . . .

I worked on several Crosleys, Models 40s and 41s. The sound from the speaker was mushy. I took the speaker apart and re-cemented the voice coil; put new insulation on the voice coil leads, and cured the trouble.

JOE ROUNDS, Iroquois, S. D.

## Allied Show

**S**ERVICEMEN and dealers showed a keen interest, according to all reports and indications, in the Radio show which was held recently in the sales rooms of the Allied Radio Corporation, 833 W. Jackson Boulevard, Chicago, Illinois. During the three days that the show was in progress, more than 11,000 Radio dealers, servicemen, amateurs, and sound men from a number of the middle western states passed through the sales room and inspected the many interesting and educational displays.

Among the exhibitors were RCA, Raytheon, Clough-Bronle, National, Triplett, Thordarson, Jefferson, Supreme, Weston, Meissner, Hallcrafters, etc. According to the Allied Radio Corporation, the unusual interest in this show



A view of part of the Allied Sales Room, showing throngs of Radio men interested in the various exhibits.

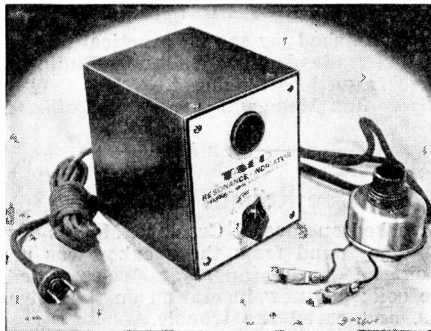
was undoubtedly due to the unique presentation which permitted each visitor to operate the equipment personally, and to secure authoritative answers to questions. The entire show proved so successful that it is understood that Allied will stage a similar event every year, and will supplement it with weekly displays and demonstrations of new equipment.

— n r i —

## New Resonance Indicator

**U**SEFUL to servicemen, is the TACO Resonance Indicator now offered by Technical Appliance Corp., 17 E. 16th Street, New York City.

Making use of the 6E5 electron-eye tube, this compact metal-cased device serves many functions. It indicates degree of resonance for accurate tuning of set or individual R.F. and I.F.



circuits. Provides means of aligning stages and may be used as output meter. Checks for "opens" or "shorts." Permits matching of condensers and indicates capacity values. Checks audio fidelity. As a bridge indicator it eliminates danger of burnouts.

Employs two 6H6 metal tubes with 6E5 electron-eye tube. One 6H6 is used in voltage-doubling circuit to supply necessary plate power for 6E5. Other 6H6 operates as linear diode detector, the rectified signal of which is amplified by triode section of 6E5 and applied to control element of latter's electron-ray section. One 6H6 and the 6E5 are housed in attractive metal case measuring  $4\frac{1}{2} \times 5\frac{3}{8} \times 5\frac{3}{8}$  inches. Second 6H6 mounts on external metal case provided with test leads and clip. Long connection cord with rubber plug for 110-volt supply.

Luminous disk with variable dark segment, provided by 6E5 electron-eye tube, is seen through recessed shadow-box opening in upper part of engraved face plate. Below is knob controlling sensitivity.