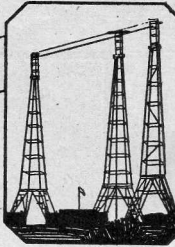


NATIONAL

RADIO

NEWS



FROM N.R.I. TRAINING HEADQUARTERS

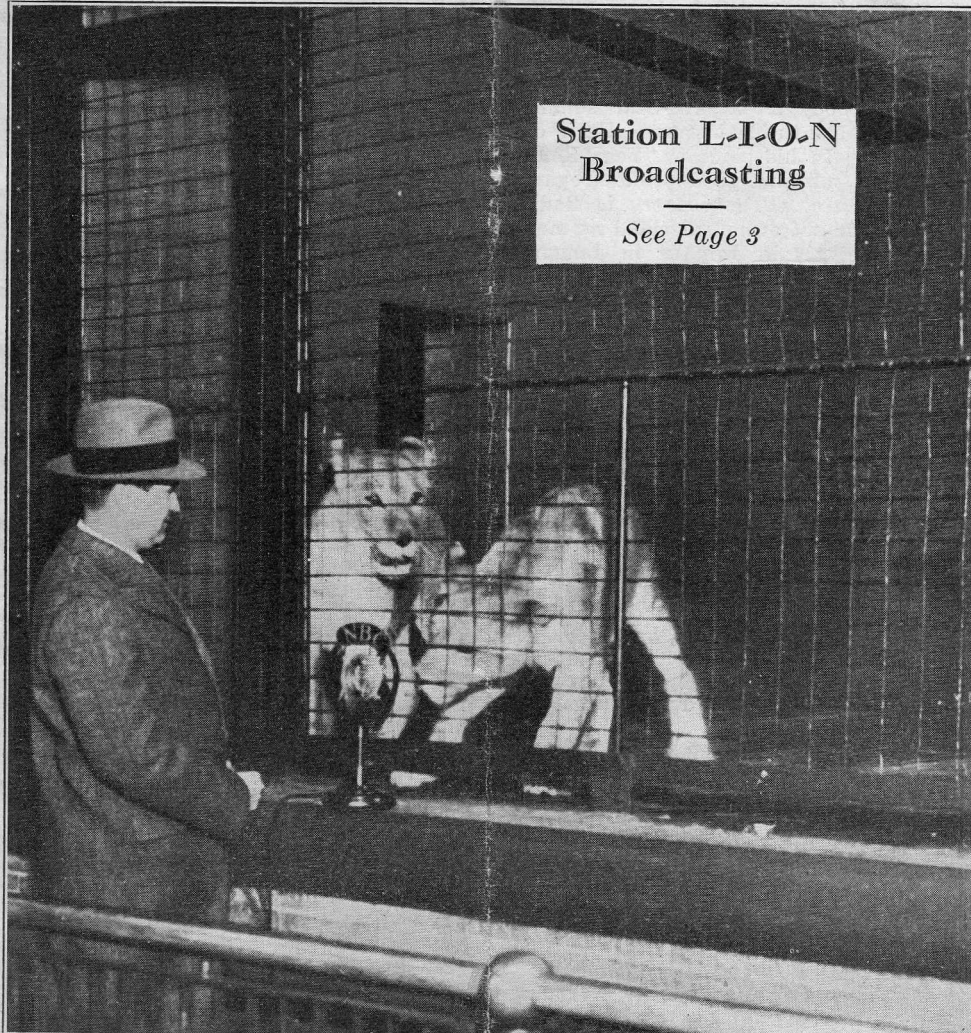
VOL. 2—NO. 11

WASHINGTON, D. C.

JUNE, 1938

**Station L-I-O-N
Broadcasting**

See Page 3





J. E. SMITH

The PRESIDENT'S PAGE

OLD MAN "SUMMER SLUMP" is on his death bed. Nine years ago he was hale and hearty; last year his strength began to fail. Today he is on his last legs—not expected to live through the month. Modern receiver construction improved summer reception, dealing him a severe body blow. All-Star summer programs are the last straw. He is out for good. In his place is "Year Round Business" offering good profits regardless of season. The country is Radiominded and set owners demand as much from receivers in July as in January. Radio-Tricians who go after the work will find a busy summer ahead.

* * * * *

WHEN the newspapers carried the news that Babe Ruth had signed with the Yankees for \$80,000 a year, many fans felt he was lucky to get so much for playing baseball a few hours each day.

They see Ruth on the diamond but they don't see him away from the ball grounds—or after the season is over. They don't know that he trains from early morning until night, day in and day out, in season and out. Stiff workouts in the gymnasium, long jogs on dusty roads, endless training. Pleasures the ordinary fellow enjoys are not for Ruth. No late hours, no tobacco, few sweets.

Ruth worked hard for his \$80,000 contract. Last Fall and Winter while the "Bill Joneses" of the semi-pros were loafing, the Babe was sweating in a gymnasium. In the Spring while the "Joneses" were waiting for the Bush Leagues to open, Ruth was out on the diamond, plugging away at batting practice. Year-round training kept Ruth's body in perfect shape. When the 1930 season opened he was ready for baseball's biggest job. A Winter's loafing for "Bill Jones" means surplus fat—he

was lucky to get a \$30 a week job on a team out in the "sticks."

Ruth's constant training is the secret of his success; Bill Jones' after-season lay-off explains why he is a Bush Leaguer. The same holds true in Radio. The men who stick to their lessons during the warm months when others are loafing, are the men who will be the "Babe Ruths" in this industry. The "Bill Joneses" who lay their lessons aside to gather dust are condemning themselves to the Bush Leagues of Low-Pay jobs.

I am glad that N. R. I. men stay in the big league class. The sincere, enthusiastic manner in which you tackle your lessons, regardless of season, clearly shows why N. R. I. Graduates succeed in Radio. As "Big Leaguers," nothing interferes from the time an N. R. I. man enrolls until he is through the course and in a good Radio job.

* * * * *

THIS Summer many Radio-Tricians are turning their eyes toward four big Radio fields which offer unusual opportunities for extra earnings.

More **Public Address** installations are in demand than ever before. Parks, Summer camps, auditoriums, hotels and apartments are good prospects for these jobs. Campers, picnickers and motorists need **portable receivers** for vacation use. This is a live field offering good opportunities. The advent of **automobile radio** is keeping trained men busy installing receivers in cars. Every automobile owner planning a long motor trip is a good prospect. Owners of Summer camps or cottages spend thousands of dollars every year for **additional receivers and accessories**. The majority of these places are not wired creating a real demand for battery sets.

Here are four fields crammed with money-making opportunities. Every N. R. I. man should land his share, or more, of this extra volume of Summer work.

PROGRAM INTEREST BUILDS DEMAND FOR NEW SETS

On the cover of this issue an announcer is shown picking up a novel program from the Bronx Zoo, New York City. This merely shows to what extremes broadcasting companies go in digging up an endless variety of interesting and entertaining as well as educational programs for their 50,000,000 listeners.

Do Radio-Tricians realize how important well planned, interesting programs are to the Radio industry? Are you making the most of these possibilities in tying up "program interest" with your Radio sales and service?

A major part of the Radio industry is dependent upon good Radio programs. A receiving set isn't worth much unless there is something good coming over the air. When your customer buys a set he does so on the faith of bringing in good and entertaining matter with it.

In the past 10 years the art of broadcasting and program building has rapidly advanced along with the technical side of the Radio industry. An army of artists, announcers and program directors create the wealth of broadcast material always on tap for the set owner—awaiting to be released at the twist of the dial. The President of the United States speaks, the landing of the Graf Zeppelin is described, sports are broadcast, orchestras jazzticate—the world's best show is on the air every night. The public favor has been captured by all this—in fact, its interest and desire to "listen in" has caused it to expend hundreds of millions of dollars for over 14,000,000 Radio sets and millions more in keeping them serviced and repaired.

If you have not already done so it will pay you to familiarize yourself with some of the favorites of the air—some of the outstanding regular programs. Such knowledge will prove helpful in giving demonstrations and closing sales. Good demonstrators invariably make it a point to know the types of programs on at a certain time of the day and evening and tune in the best for their prospective buyers.

So—make the most out of the programs on the air. Have some idea of what your customer wants to hear and what you can tune in at that particular time, and then, you will be presenting your receiver under the most favorable circumstances.

Bigger and better programs are ahead. Popular interest in Radio is growing by leaps and bounds. Over half of the people of the United States are still without Radios. That explains why around four and one-half million sets will be sold this year! Now is the time to start lining up your sales and service prospects!



Top to bottom—Dorothy Harrington of the "Forty Fathom Trawlers," the "Senator & Major" of La Palina fame, Chic Sale as proprietor of Liberty Bell Gas Station, Dora Boesher from "Around the Samovar" and Ted Husing broadcasting the famous Kentucky Derby. Headliners of the air like these and Will Rogers and "Amos and Andy" create big interest in broadcasting which in turn builds a demand for new Radio receiving equipment.

By-PRODUCTS of RADIO} By RALPH C. EDGAR Editor, Westinghouse Magazine



Radio-Eye Counter

Radio's amazing growth has created a number of new fields—by-products—which require men with specialized Radio training. It's these broad new fields of opportunity that guarantee that the technically trained man will always be in demand! Fortunate is the Radio man—no ruts or blind alley jobs to stare him in the face!—J. E. S.

COLUMBUS sought a new route to India and found a new world. Alchemists failed to find a way to convert base metals into gold but gave birth to chemistry, more precious by far than the world's whole supply of the yellow metal. Astronomy grew out of astrology.

Combustion engineers in the course of experiments, found to their surprise that

coal contains gases and solids of greater value than the fuel product itself, and today the revised family tree of coal has not less than five hundred off-shoots, including perfume and soda water, tobacco seasoning and billiard balls, fertilizer and motor fuel.

Thus the story runs through the entire history of scientific development. Thus, also, the story runs through the various acts of the gripping radio drama.

When Dr. Frank Conrad began tinkering with "wireless," it was with the sole hope that he might find a way to send sound over a distance without wires. He and other engineers worked long and hard, and they reached their goal. But their achievements did not stop with success in radio broadcasting, for every discovery leads to a further discovery. Other scientists investigated. The result is, that while the broadcasting art has been and continues to be the major outcome of investigative effort in the radio field, there has issued, in addition, a great host of valuable "by-products of radio," some of which give promise of one day transcending in importance the mother-invention.

Scores of these by-products have attained mature development and are now in actual use. Others are incubating in research laboratories, awaiting further development, with their eventual practicality not for a moment doubted. Still



Radio Traffic Control System

others exist only as vague ideas in the minds of their sponsors, but it may be that these ideas are the forerunners of some of the greatest inventions of all time.

A thrilling by-product or outgrowth of radio is television. Steady progress is being made.

Closely allied to televi-

sion is another form of sight transmission known as radio-photo. The owner of a radio-photo receiving set receives actual facsimile prints of the subject matter that is being sent. A style scout in Paris can sketch a Worth creation, hand it to the operator of a radio-photo transmitter and immediately her store in Chicago begins receiving an exact photograph of her drawing. Again, a London banker can write a check for 20,000 pounds, place it in a facsimile transmitter, and a negotiable duplicate reaches the hands of a New York broker in a few minutes.

Facsimile transmission by wire is not new, but the use of radio for this purpose is a recent development. Probably the best machine for performing this feat is the one developed by Dr. Vladimir Zworykin. A picture, drawing or piece of written or printed matter four inches by five inches in size can be placed on a transmitter, be sent through the air any distance within the broadcast range, be picked up and reproduced completely in four minutes' time.

Another well-known development that



Radio in the Movies

owes its rise to radio research is the talking motion picture. It is a fact readily admitted by "talkie" experts that the success of the talking moving picture is due primarily to the perfection of the electrical reproduction of sound which was accomplished in the radio broadcasting transmitter and receiver. Without this perfection neither the desired volume and tone quality nor the delicacy of control necessary for the synchronization of sound and sight would have been possible.

No phase of research has been more fertile in the production of radio by-products than that which has centered about vacuum tubes. In the last decade, thanks to radio, the use of vacuum has invaded practically every field of industry. Through its application, particularly in the form of vacuum tubes, our senses of sight, touch and hearing have been enormously extended.

One of the amazing tubes is the Westinghouse grid-glow tube, the most sensitive power-controlling device the world has ever known. If only the amount of energy expended by a fly crawling one inch up a wall is applied to it, the tube can actuate a relay powerful enough to start almost any electrical operation.

Then there is the photo-electric cell, better known as the "electric eye." This device is sensitive to light and shadow. Any change in the intensity of the light falling on the "eye" causes a

corresponding change in the amount of current passing through the unit. Possible applications of the "electric eye" are limited only by the bounds of



Dr. Frank Conrad's Television Transmitter

the imagination. Were one to list all of the uses to which it might conceivably be put, the total number would reach well into the hundreds. Already the "eye" is used in Pittsburgh and Wilkinsburg, Pa., to control traffic automatically by operating traffic signals when it "sees" approaching

automobiles. It serves as a never-winking watchman ready to operate an automatic fire extinguisher when it detects the faintest wisp of smoke. It takes care of numerous jobs of counting, both of persons and of objects. It is used for sorting materials according to color. It controls factory lights. It furnishes an accurate and continuous record of the intensity of smoke issuing from chimneys. It serves as an automatic sentinel, needing only a person's shadow to set off a burglar alarm.

The "electric ear" is another uncannily human by-product of radio. One of its uses is to turn on an airport's landing lights when it hears the motor-roar or siren-shriek of a night-riding airplane approaching the field.

Televox, the world-famous mechanical man who executes orders given over the telephone, owes his robot existence to the discovery by radio investigators of certain facts about sound sensitivity. This electrical servant will take his place as one of our most useful radio by-products.

"High frequency" is a term that is day by day growing in importance. By the "broadcasting" of high frequency power it is possible to fry an egg on a cake of ice. High frequency induction furnaces are used for the melting of metals used in special alloys. There is also indication that in time high frequency currents will be used for therapeutic purposes. High frequency knowledge grew out of radio studies.

Perhaps the greatest by-product of radio has yet to be invented. There are electrical engineers who predict confidently that the world will have this invention at its command before many years have passed. This invention is "power by radio." When it comes, wires will no longer be needed as power channels. To light your home and run your vacuum sweeper, you will "tune in" a power company just as now you tune in a broadcasting station for music. Airplanes will speed through the sky receiving their power by radio from generators on the earth and ships and trains, likewise, will pick up their power from the air!



Radio Facsimile Transmitter

National Radio News

Published monthly in the interest of
N. R. I. students and graduates, by the
NATIONAL RADIO INSTITUTE
16th and U Streets, N. W.
Washington, D. C.

J. E. SMITH, Publisher. E. R. HAAS, Editor.

Copyright, 1930.

NATIONAL RADIO INSTITUTE

Washington, D. C. June, 1930



E. R. HAAS

BREITBART, Germany's professional strong man, could drive iron spikes through two-inch planks with his bare fist. Yet for all his strength a mere scratch of the skin caused his death. Carelessness or supreme belief in his physical superiority made Breitbart feel immune to ordinary ills. Possibly many engagements kept him too busy to care for himself. He considered that scratch unimportant, neglected it, and his life was the price.

Many seemingly unimportant things are vital. Had Breitbart realized the consequences of delaying medical attention he would have been alive today. This story reminds me of the fellows who neglect little things and as a result lose out. The case of two N. R. I. students out in a little Kansas town last Summer is an example of this. Both of these fellows had completed the same number of lessons. One man felt it useless to devote hours to study during the hot weather—didn't feel he could get Radio business anyway in the Summer. So his spare time was spent trying to keep cool—resting, swimming, fishing.

The other fellow knew business was there if he went after it. He made up his mind to grasp the opportunities missed by Radio men who laid down on the job. While these fellows loafed, he plugged along after Radio work. He found plenty of it. Set owners wanted their receivers kept in good shape. Others needed accessories, which he sold at a profit. On top of this he secured orders to build receivers for three of his friends. To make a long story short, he earned several hundred dollars profit from June to September simply because he went after business instead of waiting for it to come to him. Today, he owns a paying Radio business, built up during the season generally thought poor for Radio.

His fellow-student, on the other hand, neglected his opportunities, just as Breitbart neglected his scratch. Breitbart lost his life; the student, four important months and the business built up by the other fellow who studied and worked.

E. R. HAAS,
Vice President & Director.

Gets African Ticket



NEWS received this month from Keetmanshoop, South West Africa, shows again that N. R. I. men are making good all over the world. Student E. G. Thompson, telegraph operator for the South African Railways and Harbor Commission just passed the stiff examination held by the West African Postmaster General. Of the forty-two candidates, Mr. Thompson was the only one to obtain the first-class license. The only other successful

candidate received a second-class ticket. Mr. Thompson's high grades spell promotion with his present employer as he was promised a more responsible position subject to passing the Postmaster General's Proficiency Examination.

Congratulations, student Thompson. You, together with dozens of other N.R.I. men, are carrying the good work of N. R. I. into the far corners of the world. We are proud of what you have accomplished and wish you continued success in Radio.

Electrad, Incorporated, 173-75 Varick Street, New York City, have prepared interesting literature on the Electrad "Lof-tin-White Amplifier."

N. R. I. men are invited to write them for this pamphlet.

BOSCO ON "AIR"

"Station KVEP, Portland, Oregon, announcing our next feature—the N. R. I. Hawaiian Trio, under the direction of John Dal Bosco."

Student Bosco and his N. R. I. Hawaiians are a popular feature in West coast programs. Tune in some night about 8:00 P. M. and hear these artists.

Besides making a record as a student, Mr. Bosco is making good over the "Mike." The News wishes him continued success both with his course and with his trio of Radio entertainers.

Don't miss the July issue of the **NEWS**. If you have changed your address let us know at once so that you can be sure to get your copy.

N. R. I. SERVICE MANUAL

ON

Bosch Radio Receivers—Models 48 and 49

This receiver is of the tuned Radio-frequency type using the transformer method of coupling the Radio-frequency tubes. It uses three—24, one—27 and two—45 type tubes. A schematic wiring diagram is shown in Figure 1. Figure 2 is a diagram showing an actual wiring of the power pack. These diagrams will enable the Radio-Trician to satisfactorily test the various circuits and determine whether or not they are in good condition.

Oscillation

A receiver which oscillates may "howl" or "squeal" steadily, or may make this noise only when tuned in on a broadcasting station. The whistle is loudest as the dial is turned slightly in either direction from the station. A strong hiss, occurring when the station is tuned in, denotes that the receiver is very near the point of oscillation. This increases the sensitivity somewhat, and will do no harm unless too pronounced. Actual oscillation, however, ruins the performance of the set. The following suggestions will be of assistance in eliminating oscillation from any receiver so affected. It must be remembered, however, that the oscillation may be due to any simultaneous combination of the causes.

1. Receiver Ungrounded: Some receivers, due to a certain combination of tubes or other factors, may operate perfectly when properly connected to a good antenna and ground is removed or when the ground connection is poorly made. The remedy consists in providing the set with a short, direct ground lead firmly connected to a water or steam pipe.

2. Defective or non-uniform tube is a common cause of oscillation. The quickest and most certain method of determining whether this condition exists is to substitute other tubes in the radio-frequency and detector stages.

3. Lack of shielding: The shielding is applied to the receiver principally to prevent oscillation and it is therefore quite obvious that all shielding must be in place and properly secured to obtain correct operation of the receiver. Make sure that the variometer shield, coil shields, tube shield, condenser gang shield, and the three small shields under the condenser gang are in place. Each shield must be firmly fastened by its

screws or clips, and good contact obtained between the shields and chassis frame.

4. Variometer Grounded: The variometer is grounded only through a special ground wire running to the ground terminal of the condenser "C8," and insulation is provided between the variometer bracket and the condenser gang so that there is no path to ground from the variometer direct to the condenser gang. Oscillation is liable to result if these two units become grounded together through a poorly insulated bracket. Check this condition by disconnecting the variometer ground lead and checking between the condenser gang and variometer bracket with the continuity test. No reading indicates a properly insulated bracket.

5. Poor Condenser Gang Ground: The condenser gang is grounded to the chassis through the bracket support at one end, and the single stud at the other. Make sure that these two joints are clean and tight. The rotor of the second radio-frequency stage is grounded through a pig-tail to the ground lug of coil L2 (second radio-frequency stage). Make sure that this wire is intact. Make sure also that the other two condenser rotors are grounded to the condenser frame through pig-tails.

6. Poor Coil Grounds: The secondary winding of each coil is grounded through one of the coil fastening lugs. This connection must be clean and tight.

7. Other Grounds: Check all other ground connections such as by-pass condenser grounds, volume control ground, and connection at "Ground" terminal post.

8. Defective Center Tap Resistor: Oscillation may result if center tap resistor "R10" is open or not grounded. Use the continuity test to check this unit.

9. Open By-Pass Condensers: One or more open by-pass condensers in the receiver may cause oscillation. This condition is best checked by using the "Condenser Test." An open condenser is, however, a somewhat rare occurrence.

10. Grid Resistors: If the resistance value of the grid resistors R4, R5 is too low, oscillation may result. Check these units for proper resistance by means of the Ohm-meter.

11. "B" voltage too high: Check the

