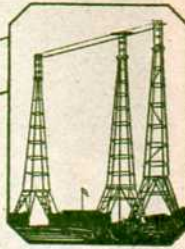


# NATIONAL

# RADIO

# NEWS



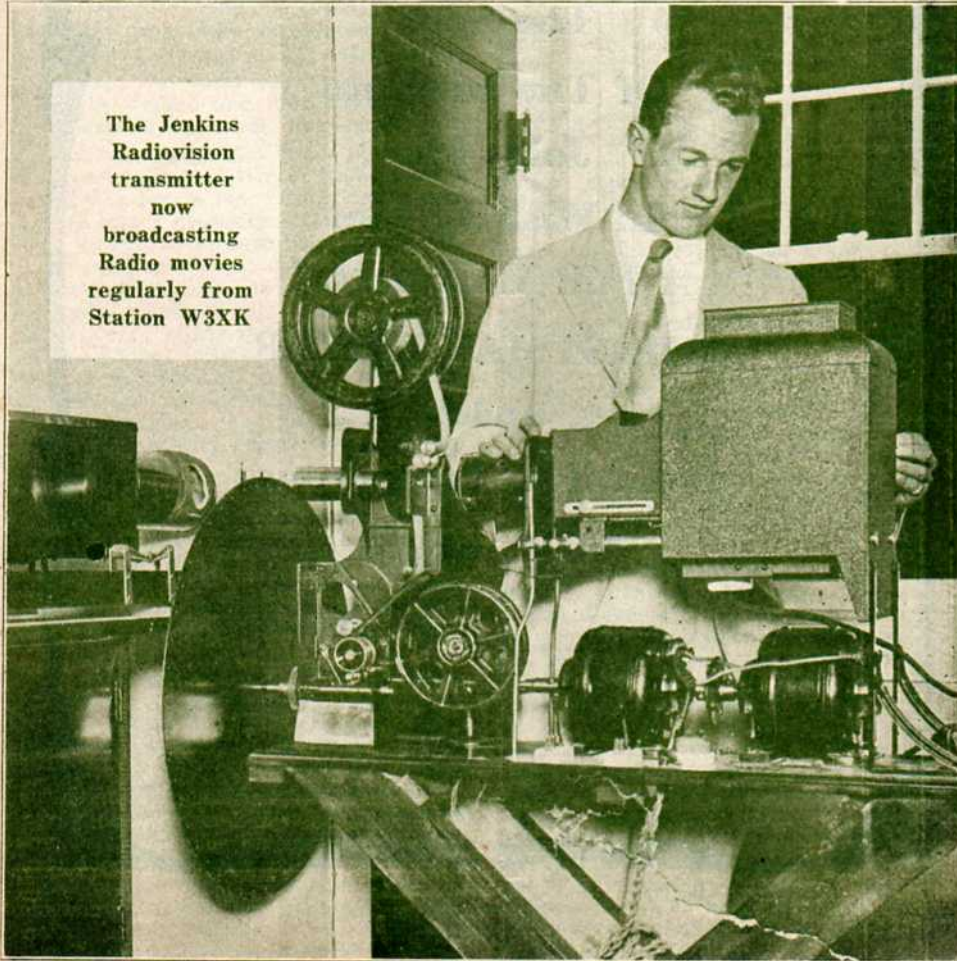
**FROM N.R.I. TRAINING HEADQUARTERS**

Vol. 2—No. 5

WASHINGTON, D. C.

DECEMBER, 1929

The Jenkins  
Radiovision  
transmitter  
now  
broadcasting  
Radio movies  
regularly from  
Station W3XK





## Christmas Greeting

The Staff  
Of The Institute  
Joins Me  
In Wishing You  
A Full Measure Of  
**CHRISTMAS CHEER**  
And A  
Bountiful, Prosperous  
**NEW YEAR**

J. E. Smith

## Vice President Curtis Lauds Radio's Progress

*Speaks at Opening of  
Washington Radio Show*



IT WAS less than 10 years ago that Radio was first introduced to the public of the United States. Most of you remember the early days of broadcasting; the limited and unsatisfactory entertainment; the crude, home-made sets.

What a change has taken place. We have seen the evolution of Radio from a novelty, a toy, a fad, into a luxury, and thence into a necessity of our daily life; it is an epic of modern business growth. As I stand here tonight, in the midst of a show displaying the latest perfection in Radio receiving sets I marvel at the development of the radio industry. Even in the United States, where we are becoming accustomed to rapid industrial growth and advancement this progress is breath-taking. And yet Radio is still in its infancy with greater developments still to come.

We are hearing much these days to the effect that modern inventions are destroying American home life. This is not true of Radio. It holds a unique place in that it is returning us to our firesides, bringing to the home the best in entertainment and educational information.

In radio broadcasting's first few years of existence, entertainment was paramount. While I believe that entertainment always will be paramount in Radio programs, yet I also believe that Radio is an indispensable medium for disseminating timely information and a means of instruction on topics of general interest.

Because the Radio penetrates to hearth and home, it is the most personal medium of public communication of which I know. It has tremendous possibilities for good.

I am very glad to say that the great broadcasting companies of today have kept it on a high level; have kept it clean; have kept it worthy of our great Nation.

Radio knows no distance. For it State lines are meaningless; borders between nations no longer exist; the seas no longer separate continents. Radio is bringing the people of our great Nation closer to each other; promoting better understanding between the people of the United States and foreign nations.

We marveled at the first national hook-ups for Radio programs, and now international broadcasting is not far distant—in fact, it has been accomplished. In the recent speech of Great Britain's prime minister, James Ramsay MacDonald, we had an excellent example. This envoy of peace and good will spoke to you over the Radio the other night and his voice was broadcast not only throughout this nation, but throughout the world.

The possibilities of international broadcasting, the interchange of Radio programs between America, England, France, Germany, and other countries of the world is established; its full benefits will be felt in the not far distant future. It will help us realize that when we speak of the other nations of the world, we are really speaking of individuals much like ourselves. I am looking forward to the day of the international program, for I know that when that time comes a new era will dawn.

Radio has played an important part in our life for the past 10 years; it will play a still greater part in the days to come—this is demonstrated in the latest products of manufacturers as shown on display in this room.

# HINTS ON LEARNING

By GRADUATE VICTOR L. OSGOOD



IT IS probably more customary to entitle such an article as this, "Hints on Studying," but it is my wish to differentiate between the two in this case and offer

a few suggestions to NRI students that I have found very helpful in my advancement of Radio knowledge. Studying without learning that which is studied is quite easy; studying and learning at the same time is a little more difficult; but learning without studying is a long and tedious process and it is doubtful if anyone, except a genius, could even keep up with the advance of the art by learning in this way.

The N. R. I. offers the best of advice on how to study the course and having completed it myself, I am in a position to say that it is entirely comprehensive enough to fit anyone, who will LEARN it, for a good position with one of the numerous radio companies in the country.

To study, memorize and be taught is not nearly as satisfactory a method of fixing facts in the mind as that of conceiving and visualizing the why and wherefore of a statement of fact or formula. Take for granted the truth of a statement made by one who KNOWS, but don't be satisfied until you have seen, in your mind's eye, why it is true. As a simple example, Ohm's law says, in effect, that the current through a resistance varies directly with the voltage across the resistance when the resistance remains constant. No doubt about it, but if you will think over to yourself, when you read that

Graduate Osgood has written a number of interesting technical articles for the New York Sun Radio Section and other publications. He has gladly written this article specially for the "News." Read it—it contains some worthwhile information from a fellow N. R. I. man. J. E. SMITH.

$$I = \frac{E}{R}$$

that the current is the result of the voltage and SHOULD, therefore, increase or decrease in value with an increase or decrease in the voltage value (a case of "cause and effect") then the formula ceases to be only a mathematical way of stating a fact, and becomes a logical statement of common sense.

The process by which I have found electrical terms to be very understandable is to think of them in terms of their mechanical equivalents; because each one HAS its physical analogy, and these physical analogies are all familiar to us in our everyday life. They are listed below:

- |                 |                            |
|-----------------|----------------------------|
| Electrical.     | Physical.                  |
| Voltage.....    | Pressure, or force.        |
| Current.....    | Velocity, or speed         |
| Resistance..... | Friction                   |
| Inductance..... | Mass, or weight.           |
| Capacity.....   | Compliance, or flexibility |

Weight is not really mass, though they have the same ratio to each other for all objects on the surface of the earth. But an article weighing five pounds, more or less, on Mars, yet the mass would be the same on either planet. That is, at a given rate of speed it would strike the same blow, when stopped suddenly, on Mars or on the earth. But we are not going to Mars and so we may consider inductance as being the equivalent of the more familiar term, weight.

We have a one hundred pound object on the floor and we exert a force against it to slide it along. If that force remains constant and the friction with the floor remains constant, then the speed of the object will also be constant.

But if we double (or triple) the force, the friction still remaining constant, we will double (or triple) the speed. On the other hand, doubling the frictional resistance would cut the speed to one-half under a constant pushing force.

This is Ohm's law illustrated mechanically and in a way with which most anyone is familiar. Substituting the electrical equivalents will readily show you why the law applies to electrical circuits.

Imagine a weightless steel bar mounted in such a manner that one end is rigid while the other end may be moved by flexing the steel. Here we have a capacity which offers infinite reactance to a constant motion in one direction (considering the spring to be unbreakable). It moves through a short distance and

(Continued on page 15)

# 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.

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Washington, D. C. December, 1929



E. R. HAAS

THIS—the Christmas Season—is one of the happiest times of the year for us here at the Institute. Mr. Smith, "Chief" Dowie and I get together and check back over the accomplishments of the year, look over the records of students and graduates, the jobs you are holding down, the step by step progress you are making, and the opportunities right ahead of students just starting in the course.

Year in and year out we have seen men come into our student body, study hard, master Radio and graduate into promising positions in a new, fascinating field. Before us there is a sort of parade of men from the ranks of the unskilled, the lowly paid and untrained on to the field of Radio opportunity equipped with the weapon of specialized training ready for a Radio career!

Now, isn't that enough to fill one with joy? Nothing gives more satisfaction than being able to help others achieve big things—to live richer, more successful lives.

To those of you who have not yet graduated we are looking ahead with you to the time when you will be full-fledged Radio-Tricians. There are better times ahead for you. There are times ahead when an hour's study now may mean hundreds of dollars to you! There are times ahead when you will be called upon to make important decisions, solve problems and do other high-grade professional work. So let me urge you to



Drawn for the "News" by Student Allen of Wayzata, Minn.

carry on in the traditional N. R. I. spirit. Master your work step by step, carefully, thoroughly, so that during the coming year you, too, may take advantage of Radio's big opportunities! E. R. HAAS.

"The great need at the present time is for men who are really trained and who will think."—Thomas A. Edison.

Every man is knocked down at least once—it is the getting up that counts.

To earn more, learn more.

## IMPORTANT

When you write in for Consultation Service we want to give you a quick, accurate reply. You can help us serve you better by stating your problem clearly and fully. For instance, if you want to know something about a certain set or want some advice on repairing a certain circuit—be sure to tell us the name of the set, the model, the number and type of tubes used, etc. We have to know those essential facts before we can give you accurate, rapid Consultation Service. J. A. DOWIE.

**MORE THAN** 67,000,000 copies of newspapers in the month of September, 1929, alone, carried publicly on Radio-Tricians and the N.R.I. A dozen or so clippings are shown below. Notice the headlines. Notice how the editors "play up" the N. R. I. and the service its graduates are rendering. All this publicity means big value to N. R. I. men. It means that the public is learning more about the N. R. I. and the type of ambitious men it trains. There's no other training organization in the world that we know of that is giving its graduates such valuable publicity backing. Tell the people in your community that you are a Radio-Trician—a member of the N. R. I. organization that's getting so much newspaper attention. Cash in on all this good will!

—EDITOR.

**12 MONTHS AHEAD**  
Salesmen look forward to the month of October, November, and December. These three months are the best of the year for the Radio-Trician.

**Government Interest in Radio Grows as Federal Jobs Development**  
Aircraft Expected Soon Be Required for Carry Radio Equipment

**STAR TELEGRAM**  
Radio has come in for its full share of attention in governmental circles lately, and this trend, comments J. E. Smith, president of the National Radio Institute of Washington, D. C.

**SERVICE MAN IS BIG SALES AID**  
Radio simplicity of operation has brought radio intricacy as regards servicing.

**HERALD EXAMINES WORLD MARKET AT 200,000,000**  
The saturation of the world market for radio sets is being estimated at 200,000,000.

**35,000 RADIO SETS PER DAY, COUNTRY'S OUTPUT**  
Thirty-five thousand radio sets per day is the estimated output of this country's radio factories for September, October, and November.

**TELEVISION SERVICE TO APPEAR SOON**  
The unexpected and steadily increasing demand for radio trained men by marine and air radio, marines, production, merchant and serving organizations, has used the demand to exceed supply according to J. E. Smith, president of the National Radio Institute, Washington, D. C.

**REMOVAL OF REMOTE TUNING IS PREDICTED BY SMITH**  
According to J. E. Smith, president of the National Radio Institute in Pittsburgh, Pa.

**Radio Beacon Aids Growth of Aerial Radio**  
Radio Institute president says.

**IS FIRST IN RADIO OWNERSHIP**  
Recent press dispatches with leading the matter of radio sets with 412,115 sets to be produced, or 47,000 per month.

**AS JOBS AS PERTS AND**

**BROOKLYN STANDARD UNION**  
Business failures in Brooklyn, according to a survey by the Standard Union, were due to lack of competence and were due to lack of training.

**AVERAGE BUSINESS IS HIGH IN RADIO FIELD**  
The average per capita business of the retail radio dealer for the fiscal year ending July 1 was \$14,527 according to J. E. Smith, president of the National Radio Institute, Washington, D. C.

**RADIO TRAINED MEN IN BIG DEMAND, SAYS INSTITUTE PRESIDENT**  
The unexpected and steadily increasing demand for radio trained men by marine and air radio, marines, production, merchant and serving organizations, has used the demand to exceed supply according to J. E. Smith, president of the National Radio Institute, Washington, D. C.

**Marine, Air Service Draw Students; More Needed in Future**  
The unexpected and steadily increasing demand for radio trained men by marine and air radio, marines, production, merchant and serving organizations, has used the demand to exceed supply according to J. E. Smith, president of the National Radio Institute, Washington, D. C.

**MARKS PRESENT TELEVISION STATUS**  
ACTION rather than talk marks the present status of television, according to J. E. Smith, president of the National Radio Institute, Washington, D. C.

**Telephone Service to Ocean Stations**  
The National Radio Institute is preparing to install a telephone service to ocean stations.

**ST. PAUL, MINN. NEWS**  
The National Radio Institute is preparing to install a telephone service to ocean stations.

**TO APPEAR SOON**  
The National Radio Institute is preparing to install a telephone service to ocean stations.

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The National Radio Institute is preparing to install a telephone service to ocean stations.

**Skilled Service Men Demand for Radio Work**  
Paradoxical as it may seem, the simplicity of operation of the radio set has resulted in a demand for skilled service men. This is because the radio set is so simple that it can be used by anyone, but it is so complex that it requires a skilled service man to repair it.

**NEW YORK AME**  
The National Radio Institute is preparing to install a telephone service to ocean stations.

**Up-to-Date To Have**  
The National Radio Institute is preparing to install a telephone service to ocean stations.

**TO APPEAR SOON**  
The National Radio Institute is preparing to install a telephone service to ocean stations.

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# Radio-Trician's Service Manual

## on the Earl Receivers, Models 21, 22, 31, 32 and 41

The Earl receivers, Models 21 and 22, use a neutrodyne circuit having three '26 type tubes as Radio frequency amplifiers, one '27 type tube as a detector, one '27 tube as the first audio amplifier and two '71 type tubes as a push-pull amplifier. The schematic diagram of these receivers is shown in Figure 1.

Models 31 and 32 are also neutrodyne type of receivers using three '27 type tubes as radio frequency amplifiers, one '27 tube as a detector, one '27 as the first audio frequency amplifier, and two '45 type tubes in a push-pull amplifier. The schematic diagram is shown in Figure 2.

Model 41 is practically the same as Models 31 and 32, with the following exceptions: Model 41 has an additional stage of R. F. amplification using a '27 tube. In Models 31 and 32 the neutralizing condensers are connected from the grid to a tap on the secondary winding of the next R. F. transformer. In Model 41 the neutralizing condensers are connected from the grid to a special neutralizing coil connected to the plate coil of the same tube.

The power supply of Model 41 is the same as the power supply used in Models 31 and 32.

### Removing Chassis From Cabinet

- Remove aerial and ground connections.
- Disconnect the attachment cord from house lighting socket.
- Break the A.C. connection to the speaker by removing friction tape and unsoldering leads. (Note: This step is eliminated when inductor dynamic speaker is used.)
- Disconnect speaker leads from chassis.
- Dismount switch from cabinet.
- Remove tuning and volume control knobs.
- Remove bolts holding chassis to cabinet.
- Chassis may then be removed through rear of cabinet.

When placing chassis in cabinet, care should be taken to see that the tuning

and volume control shafts are properly centered.

### Special Service Notes

In testing the continuity of the circuits the ordinary B battery and high resistance voltmeter method may be used. Careful study of the schematic diagram will enable the Radio-Trician to determine the approximate voltage reading that should be obtained when making such tests.

Such continuity tests, however, will not always reveal the source of trouble. The information contained in the following paragraphs will cover practically all cases of trouble encountered in servicing these receivers.

### Incorrect Voltages

#### Low Filament Voltages—

- Defective power transformer.
- Poorly soldered connections in filament circuit.
- Grounded filament circuit.
- Defective tube or tubes.

#### High Plate Voltages—

Open 15000 ohm resistor or open connection between detector tap and ground.

#### Low Plate Voltages—

- Defective rectifying tube.
- Defective power transformer.
- High resistance leak in plate circuit or power supply.

#### No Detector Plate Voltage; All Other Plate Voltages Low—

Short-circuited wiring in detector plate circuit.

#### No Detector Plate Voltage; All Other Plate Voltages High—

Open 25000 ohm resistance.

#### No R.F. and Detector Plate Voltages; All Other Plate Voltages Low—

Short in radio frequency plate circuit.

#### No R.F. and Detector Plate Voltages; All Other Plate Voltages High—

Open 4000 or 5000 ohm resistance.

#### Set Will Not Neutralize—

- Open by-pass condenser in R.F. plate circuit.

