

With WRBI "Lucky Day"



THIS MONTH'S COVER

Down in Georgia, graduate Frank A. Parkins is the man who puts Radio Station WRBI on the air. Frank is Engineer for WRBI and owns and operates Amateur Station W4DN. In addition to his interesting work with the two stations, Parkins finds time to handle service work. He gives N.R.I. credit for his success.

This cover is very fitting for the Broadcast Issue of the News. It shows the world's two largest "Radio Plants." On the left is the Home of the National Broadcasting Co., to the right the beautiful Columbia System building. From studios in these buildings thousands of programs go out to all parts of the continent. A steady stream of visitors are always on hand to see what makes the wheels of broadcasting go around.

"It was my lucky day —when I enrolled with N. R. I.," says Graduate Peter Turchi. N. R. I. training helped him get into the U. S. Navy and win promotion to the grade of Radioman First Class, at \$94.00 a month, food, lodging, etc. It enabled him to travel 65,000 miles. Since leaving the Navy he has landed a good job and made over \$3500 in fourteen months.

-----TEAR OFF HERE AND MAIL-----

Will You Spend Two Minutes To Help Your Friends?

Be a real friend. Share your good habits with others. Give us the chance to point out to them what N. R. I. is doing for you—for ambitious men everywhere; how it is raising incomes by fitting men and young men for good jobs in Radio. List a few names and addresses below, of people interested in Radio, or who are dissatisfied with their present jobs. Your name will not be mentioned when writing to them.

Each man whose name and address you list will receive a free copy of National Radio News. And if the names have not already been received from some other source, you'll receive a \$5.00 commission for each one who enrolls.

Your Name: _____

Your Address: _____

Your Student Number: _____

Mr. _____
 Address _____
 City _____ State _____
 Occupation _____ Age _____
 Interested in:
 Amateur Radio Service Work
 Set Building

Mr. _____
 Address _____
 City _____ State _____
 Occupation _____ Age _____
 Interested in:
 Amateur Radio Service Work
 Set Building

Mr. _____
 Address _____
 City _____ State _____
 Occupation _____ Age _____
 Interested in:
 Amateur Radio Service Work
 Set Building



VOL. 3—NO. 10

WASHINGTON, D. C.

MAY, 1931



THE HOMES OF CHAIN BROADCASTING

(See Page 16)

RADIO BROADCAST NUMBER



\$125.⁰⁰
AN HOUR

THE time is midnight. The place, a little town in far-off New Zealand. Come, let's stroll down a street.

Here we pause before a house. A light is in one window. The rest of the houses are dark. Look through the curtains—a man is at a desk—studying. On the wall is the banner of N. R. I.

We could wander through streets in Egypt, Ireland, Borneo, Brazil, Mexico, Russia, Canada, America; in fact, any civilized country in the world, and view the same scene.

Why are these men of many creeds and climes working overtime? They are not getting the usual time and one half—what are they getting?

They are investors. They are investing in Time. Time—a most precious asset—which knows no rules of interest rates—Time, which is frequently so foolishly spent—even thrown away.

What dividends does the investment pay? Let's figure it out.

The average student of N. R. I. puts in about 400 hours of study on his course. Considering he was 24 years old when starting his Radio studies, if he received only a five dollar a week increase of income, for the balance of his natural life, he will show a profit of \$10,000. Each hour of study brought him \$25. Very good pay—we'd say.

But go further. Quite a number of N. R. I. graduates, after a little experience, increase their earnings two thousand or more dollars a year. At this rate during the balance of their natural life their increase would be something like \$50,000 or \$125 for each study hour.

Most fellows would jump at an offer to work overtime for \$10 an hour. Study offers you a much better proposition. Will you accept? How many hours overtime will you work? Think it over.

J. E. Smith
President

FOUR ACES in the



JAMES DONOVAN
Radio Station WTOC

BROADCAST GAME



RALPH COPENHAVER
Radio Station WHBD

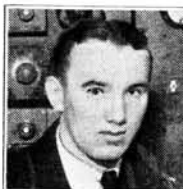
Broadcasting has risen, in a few short years, to the position of a necessity. Upon Broadcasting depends the entire structure of Radio as entertainment. Without it, receivers would not be manufactured nor sold.

A recent survey showed a total of 1095 broadcast stations in the world. Of this number 707 or approximately 65% are on the North American Continent; 623 in the U. S., 77 in Canada, and 7 in Mexico. What a field of opportunity for the Radio-Trician specializing in Broadcast work. The Columbia System employs more than 50 Broadcasting engineers at their key station, WABC, alone.

Well over 100 stations have employed N. R. I. men, a fine record, proving that N. R. I. trained broadcast men can do the job properly.

From the hundreds of N. R. I. men successfully entered on careers in Radio Broadcasting, we have selected four to illustrate this article. Let's see what N. R. I. training has done for them.

First, there's James Donovan, of Savannah, Ga. Donovan received his amateur license four months after starting his N. R. I. training. Two months later he obtained his broadcast license. The day after receiving it he went to work at WCOC, rebuilt it, followed by rebuilding WOAN, and is now with WTOC. Looks like the N. R. I. man gets the jobs.



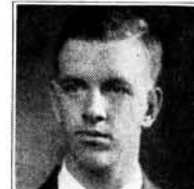
SYLVANUS EBERT
Radio Station WSUI

Now meet Ralph Copenhaver, of Mt. Orab, Ohio. Ralph is Chief Announcer and Program Director of Station WHBD. His N. R. I. training helps him hold this job. It also assisted him in getting and handling the Public Address Operator job on the steamer Cincinnati during the Ohio River Dedication Cruise.

Another live-wire broadcast man is Sylvanus Ebert. Immediately upon graduating from N. R. I., Ebert obtained his operator's license. Instead of taking an operator's position, however, he accepted an assignment as service man to get experience in this field. His salary of \$40 to \$50 a week was quite an increase over the \$18 weekly pay as a shoe factory hand before his enrollment.

After eight months Radio service, Ebert had the experience he desired in that type of work, and N. R. I. Employment Department helped him get a position with KWCR. Since then he has been with KTNT and WSUI. Ebert thanks N. R. I. for his success.

When R. L. McLaughlin became an N. R. I. student he was working in a furniture factory in Portland, Maine, at \$15 a week. And it was hard, laborious work, too. Today he earns from \$35 to \$60 a week, holds down a position with WCSH and finds the work more pleasant and interesting than anything he's ever done before. His N. R. I. training fitted him for the better things in life.



R. L. McLAUGHLIN
Radio Station WCSH

National Radio News

Published monthly in the interest of its students and graduates, by the

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Washington, D. C.

J. E. SMITH, Pres. E. R. HAAS, V. Pres. & Director.

Vol. 3—No. 10

May, 1931

FIGHTIN' WORDS

"When you call me that—SMILE!"

Most of us, who have read Wister's "Virginian," remember that line—a reply to "fightin' words."

We don't hear fightin' words much any more—the world has gotten too polite and diplomatic. Folks "smile" nowadays when they say them.

So if we don't hear the things people think of us, spoken to our face—it's up to us to find out what they are saying behind our back. Maybe it would do us good.

Suppose someone is saying: "He wastes time." That's really a "Fightin' Word," because a time waster is just no good to himself nor anyone else. We'll want to FIGHT, not with the fellow who said it, but with ourselves, if we are guilty. "Laying down on the job"—"Being a quitter"—"Neglecting Bills" and "Doing sloppy Work"—are all Good Fightin' Words.

Let's look this thing square in the face. Maybe folks do say things like that about us. Let's put a stop to it. Why not say a few fightin' words to ourselves—when we're all alone. If they make us mad it's ten to one we're guilty. Then let's cut out the things we're doing which make the fightin' words true.

If we'll do this conscientiously for a while—it will cause a great improvement—then when we "Call ourselves those fightin' words, we'll—SMILE."



A Thought for the Month

MAY makes a fellow feel like he owns the world. Part of the world, at least, is ours—and in May, Mother Nature puts forth her best efforts to make Our World a wonderful place to live. Let this month be a milestone in our advance toward happiness. The road is through study and work.

GRADUATE PERDUE NOW CHIEF ENGINEER

Appointment of Polk Perdue as chief engineer of Radio Station WAPI has been announced.

Perdue became associated with WAPI in August, 1929. He is a graduate of N. R. I., and has been associated with many forms of radio broadcasting.

As a ship operator Perdue visited the four corners of the earth. His 13 years experience with many types of transmitters has given him a vast resource of technical knowledge. He includes in his experience aiding in construction of a 10,000-watt transmitter.

Amateur Station WXFI, of which he is owner and operator, has been heard in all parts of the world. Ability to operate a high-power transmitter at minimum cost, gives Perdue a reputation of being one of the country's most conservative radio engineers.

The faculty and staff of the Institute join National Radio News in congratulating Polk Perdue—another outstanding graduate of N. R. I.

The world's biggest room is the room for improvement.



E. R. HAAS
Vice President and Director

BUILDING A MODERN SET ANALYZER

By FRANK L. SPRAYBERRY
Special Consultant on Radio Servicing



A set analyzer is the service man's most valuable piece of equipment as it facilitates the service of modern broadcast receivers.

Many service men do not have accurate set analyzers due to the cost involved in purchasing factory built analyzers. Most good set analyzers cost \$75 and upward. N. R. I. students and graduates have requested constructional plans for a satisfactory set analyzer, which could be built at a much lower cost. We, therefore, set about to design a tester as low in cost as possible, using first-class parts, with a degree of accuracy comparable with that found in the ordinary analyzer.

The tester shown on page 11 incorporates three standard meters. They are manufactured by Weston. However, if you desire, other meters may be substituted. It was necessary that we choose a certain type of meter as all manufacturers do not make meters of the same range.

On the left we have a three-range A.C. voltmeter, the lower ranges being used to measure filament voltage and the 150-volt range for measuring A.C. line voltages. 800 volts A.C. can also be measured with this meter by connecting a good precision 8,000 ohm resistance in series with the 4-volt range of the meter. Then the high-voltage secondaries of power transformers up to 1600 volts can be measured. This is done by measuring the voltage between the center tap and one outside end of a power transformer.

The center meter is a Weston 0-1 milliammeter. While other meters such as the Jewell or Hickok may be used if desired, it is advisable to use meters of the same size and general appearance for a neat job. Resistances are connected in series with this meter making

it a D.C. voltmeter having the following ranges: 0-10-25-50-100-500-800 volts D. C. Such a meter will have a resistance of 1,000 ohms per volt. Every 1,000 ohms connected in series with the meter increases its range one volt.

The meter on the right is a Weston two-range milliammeter or its equivalent. The range is 15-150 milliamperes for current measurements. This allows you to measure all current values ordinarily encountered when servicing modern receivers.

Eight Yaxley push button switches are provided for making the various connections to the meter as shown at the bottom of the diagram. Grid voltage measurement is controlled by the first switch to the left, plate voltage by the second switch, screen grid voltage by the third switch, control grid voltage by the fourth switch, cathode voltage by the fifth switch. The sixth switch controls the A.C. four-volt range of the A.C. voltmeter, the seventh controls the 8-volt range of the A.C. voltmeter while the eighth switch allows D.C. filament voltage measurement.

Switch S_1 is also of the push button type and is provided to reverse the meter polarity in cases where the cathode voltage is reversed or where the filament D.C. voltage is reversed from the usual connection. Also, in making any D.C. voltage measurement, the meter polarity may be reversed by pushing down the button of this double pole double throw push button switch.

Switch S_2 is a Yaxley inductance switch of the six-point type. It allows a selection of voltmeter scales varying between 10 and 800 volts.

Switch S_3 is to be used when measurements are made to either a four-prong

(Next page, please)

BUILDING A MODERN SET ANALYZER

(CONTINUED FROM PRECEDING PAGE)

or five-prong type of tube. This switch is of the toggle type single pole double throw. In position A, four-prong tubes are tested and in position B, five-prong tubes.

Switch S_4 is another inductance switch of the three-point type. This switch controls the milliammeter. The meter may be connected directly in series with the plate circuit of a tube or by throwing the switch to the third position, the meter is left out of the plate circuit. In position 2, the 150 milliamper scale is connected in series with the plate circuit. In position 1, the 15 milliamper scale is connected in the plate circuit. Switch S_5 is also of the push button type and allows measurements to be made on both plates of the rectifier tube. Ordinarily the switch contacts are permanently closed, connecting the plate terminal P of the four-prong socket in the meter circuit. However, by pressing the push button connection is made to the grid terminal G of the same socket allowing measurement of the current of the second plate of an '80 type rectifier tube.

Switch S_6 provides a means of changing the bias on the grid of a screen grid tube while switch S_7 accomplishes the same purpose for regular three-element tubes. This provides a mutual conductance test by changing the bias on the grid of the tube, thereby changing the plate current reading. In most cases, the greater the difference between the two plate current readings, the better the tube. In this connection, no standard values can be given as to what constitutes a bad or good tube. Test good tubes and make yourself a table, then comparisons can be made using the table as a standard when testing tubes of unknown condition. Switches S_6 and S_7 are also of the push button type being of the single pole double throw variety.

Switch S_8 is a toggle switch. This allows continuity tests to be made using

the $4\frac{1}{2}$ volt C battery connected in series with the 10 volt scale of the D. C. voltmeter. In this connection the meter will also act as an ohmmeter. The unknown resistance is connected across the two binding posts marked continuity-ohmmeter and switch S_8 is closed. Readings are made on the 10 volt scale. R will equal E divided by I which in this case will be $4\frac{1}{2}$ divided by the current indicated on the meter. The current will always be less than 1 milliamper. After making your calculations, subtract the 10,000 ohm series resistance from the resistance value you have calculated and you have the value of the unknown resistance.

For example, suppose the milliammeter indicated .2 milliamper. We would divide $4\frac{1}{2}$ by .0002 which would give us 22,500 ohms. Subtracting 10,000 from 22,500 the unknown resistance would have a value of 12,500 ohms. You can readily see that you can make calculations for every current reading on the meter scale and make yourself a table or chart with these readings. Then when measuring an unknown value of resistance, it will only be necessary to refer to your table or chart and you can quickly interpret the value of the unknown resistance. The resistance range of the ohmmeter may be increased by connecting a higher voltage in series with the meter. However, not more than 9 volts should be connected in series with the meter.

Nine binding posts must be used to provide external connection to the meter. Three binding posts are provided at the left of the diagram as you will notice. These allow external measurements of 150 volts A.C. and 800 volts A.C.

Six other binding posts are provided, two for D.C. external voltage measurements, two for the continuity-ohmmeter

(Page 11 for diagram)

WHAT ARE THE BROADCASTERS DOING FOR RADIO?

By P. J. MURRAY, Manager
N. R. I. Employment Department



Notwithstanding adverse comments occasionally voiced by individuals, the broadcasters are doing a great job for the Radio Industry.

Of course we hear—"too much drama"—"too much jazz"—but these comments are not representative. They are individual complaints and have little bearing on the subject.

The broadcasters, as a whole, exercise wonderful judgment in program type. Programs are arranged by skilled directors. They know what their public wants. If they don't it is the fault of the public, not the station.

Every station welcomes comments and criticisms—because it is their business to give the public what they will listen to, otherwise that station will not be a drawing power—therefore, not the logical place for sponsored programs.

Reliable statistics point to the fact that the broadcasting stations of the United States utilize 53% of their time on the air to music. Thirty-four per cent of this amount is devoted to "jazz."

While that figure holds good for the country as a whole, it will not be found true for the individual station. If we hear a certain station rendering seventy-five per cent classical music and twenty-five per cent music of other types we can be sure that they know what they are doing. It is quite evident that they have learned from their questionnaires to listeners and from the mail received from interested parties that they are giving the public of their community what they want.

No station will arbitrarily broadcast programs which aggravate listeners—make them turn the dial to another station. It would be the same as a dealer insulting a customer to make him go next door and buy.

Broadcasters, to make their programs interesting and varied, have attracted the most brilliant writers, educators, scientists, to say nothing of musicians of all types.

The broadcasters have helped make Radio. They have spent money lavishly for salaries of trained Radio men and for broadcast talent.

If the broadcasters weren't doing their job right, manufacturers, dealers and jobbers would be in a bad way. No one would buy a receiver if programs of interest were not available.

N. R. I. is proud that, over one hundred of the broadcasting stations in the United States, have employed N. R. I. broadcast men. A fine record. One-sixth of the Radio stations of the United States, or one-twelfth of the stations of the world, have employed N. R. I. men. For this reason, if no other, the broadcasters of this country should be looked upon with good will by every N. R. I. student or graduate.

A 500 watt Radio station uses less power than the average electric iron. All broadcasters in the U. S. use an aggregate of 1,453,355 watts. The total received energy of over 13,000,000 Radio sets in this country is less than 15 watts.



DEVELOPMENTS IN BROADCASTING

By J. A. DOWIE, Chief Instructor

Studio equipment that permits speakers, singers or orchestras to hear themselves as others hear them over the Radio, has been installed at the WGY station.

All persons must give auditions before they are permitted to go on the air. It is customary at such auditions for the musical director to listen to the voice as reproduced by a loudspeaker. In this way, it is possible to judge the voice, not for real quality, but for adaptability for radio. A fine concert voice may be a complete failure after it has passed from microphone to loudspeaker. Some artists, when told that their voices are not suitable for radio, accept the decision with good grace. Others regard this explanation as a polite way of refusing them an opportunity to be heard on the air.

The new equipment has solved this difficulty by using a film sound recorder. When this film is reproduced through a loudspeaker, the voice is heard exactly as it would be heard through a loudspeaker after it had been picked up from the air.

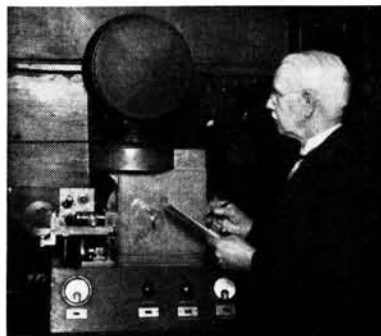
If there is any doubt about the suitability of her or his voice for radio, when a singer appears at the studio for an audition, a film record is made. The recorder is in another room, connected to the microphone by wire. After hearing the film record, the singer invariably accepts the evidence. If rejected they usually thank the management of the

station for saving them a performance which must have been below their standard, and which might result in loss of concert engagements instead of increased professional prestige.

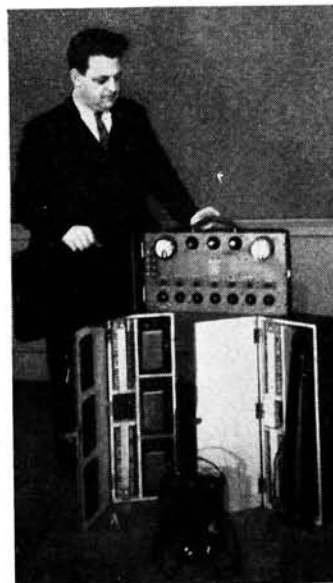
The film sound record also proves valuable in training announcers. The announcer's voice is recorded and he, hearing the reproduction, has a chance to correct faulty speech, over-emphasis or wrong inflection.

The orchestra director is afforded an incomparable medium to experiment with the placement of instruments with respect to the microphone. The same group may play the identical selection two or three times, and by merely changing the position of the instruments unusual effects may be produced.

The equipment also permits the recording of feature programs during re-



Voice recording and reproducing instrument. Critic is here shown listening to film record of Audition.



Portable microphone and amplifier equipment.

hearsal. The director, listening to the reproduction may find imperfections which escaped notice in the studio.

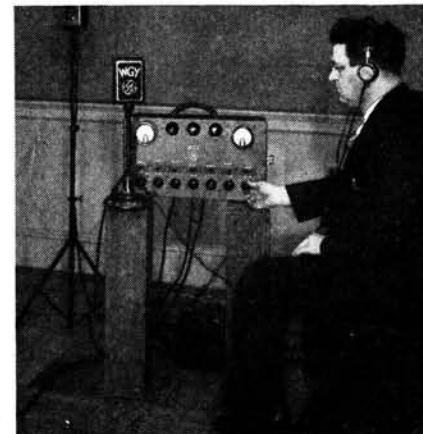
A portable microphone equipment for outside or remote programs, as sensitive and efficient as that used in the studio, and only weighing one hundred and twenty pounds, has also been developed.

Long after the condenser microphone was adopted for studio use, broadcasting stations generally continued to use the carbon microphone for outside programs because of the rough treatment to which the pick-up device was subjected in handling. Recently a complete amplifying and microphone equipment has been condensed to three containers, each container a little larger than a suitcase. Two of these are made of wood, one to contain three microphones, dry batteries and extra tubes and the other contains cable, microphone tripods and dry batteries. The third container is the control board, built to take care of a five microphone pick-up.

The control board contains the amplifier and mixers for each microphone. At this board the operator checks the quality, controls the volume and cuts microphones in or out as the program requires. The wooden boxes may be used as a table for the control board.

Should occasion arise for the announcer to carry a microphone to a speaker in a crowd this may be done very easily by providing a sufficiently long microphone lead.

The term "electrical transcription" refers to a special source of broadcast programs. The various programs are recorded on a large record very similar to the phonograph record. This record is then sent to different broadcasting stations throughout the country and by means of special transmitting apparatus similar to the ordinary phonograph pick-up the record is broadcast over the broadcasting station just the same as an ordinary broadcast program. The quality of the broadcast signals is practically the same as the quality of the original program and gives just as good results as if the program was being actually carried on within the broadcasting station.



Equipment set up for remote broadcast.

THE SUMMER "LET DOWN" ITS EFFECT ON YOU!

The good old summertime is just around the corner—ready to jump out on us without warning.

She has her train of fair charmers with her, ready to help in the work of destroying Ambition. "Summer Sports." "Summer Amusements." "Summer Nights"—with a seductive, treacherous smile! "Summer Days"—with Old Sol perched on her shoulder, fairly screaming "Don't try to work! Throw up your hands and play."



WM. W. SAUNDERS, JR.
N. R. I. Student
Service Department

In the Service Department we begin to notice the effect of the summer "let-down" spirit just about this time. Men who have studied hard and faithfully all through the winter months begin to slow up. Men whose grades have been "A" or "A+" start to drop down to "B"—or even "C." The old pep seems to be lacking and "Summeritis" begins to get in its dirty work!

Then the excuses start coming. Letters to Mr. Smith—"I'm just taking a little breathing spell." "I'm sorry I can't seem to keep going like I was a few months ago." "I'll be back studying again soon!" And Chief Dowie's desk is filled with excuses instead of the lessons he wants to see.

But other N. R. I. men (a large majority, too) stick to their guns. The hotter it gets, the harder they study, evidently. They are the men who know the danger of slack periods in studying as well as business—they realize how hard it is to get started again.

Of course, we all know it's mighty easy to slip into the "ho-hum! let the lessons slide awhile" frame of mind. The temptation to "unlax" is strong! But follow the same line of thought—what would happen to the taxicab business and the lunch room if Amos didn't keep right on plugging away?

The trouble is, the harm done by the Summer slump doesn't show up right away. A man thinks he's getting away with it; a lesson thrown aside for a few weeks—what difference does it make? When it gets cooler, he'll make up for lost time, he thinks.

Did you ever try to push an automobile up a little slope? Get it started and keep it rolling and everything is fine and dandy. Just stop to take a little rest half way up and then try to get started again!

It's the same way with studying—only you don't pay for the "little rest" right off the bat. But several months later—in the Fall, when you should be ready—! The N. R. I. men who have stuck to their lessons are READY. The good jobs that are open go to them.

In a few years they are sitting pretty on "easy street." And some of the men who "let-down" when the hot weather came—still are struggling to get back in line.

Figure it out for yourself—is it worth the loss of time and opportunity? Even though it's hot as blazes and it seems like real punishment to study, don't forget the reward for perseverance—more money and a real future.

Good resolutions are generally made on the 1st of January. It seems to me a better time for N. R. I. men would be the 1st of June. That's the time to take another hitch in your belt—stick out the old jaw a couple of inches and resolve there'll be no "let-down" for you this Summer!

The contest judges of the "Results contest" have promised to have their decisions ready for publication in National Radio News for June. Watch for the notice of the winners.

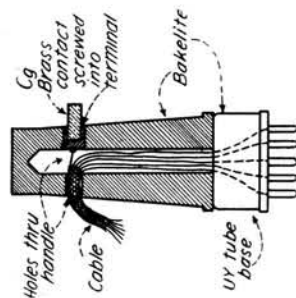
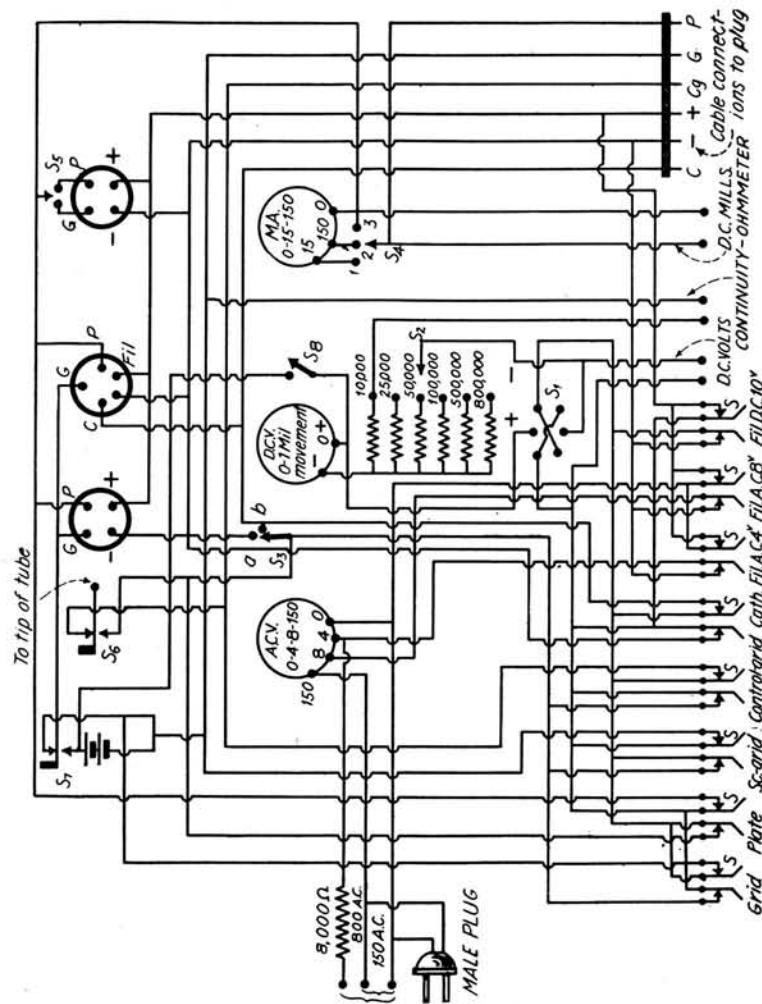


Diagram of Modern Set Analyzer

BUILDING A MODERN SET ANALYZER

(CONTINUED FROM PAGE 11)

measurements and two for the two range milliammeter.

Switch S_2 allows you to select any range of the D.C. voltmeter for external voltage measurements while S_4 allows you to select the two current ranges of the milliammeter for external current measurements.

Details of the test plug are shown on page 11, which can be constructed from any five prong tube base. A piece of copper tubing is screwed to the top of the plug for control grid connections of screen grid tubes.

We will not attempt to give the layout of the tester as every constructor has his own ideas about this. The tester should preferably be arranged in a carrying case and the various instruments mounted on a bakelite panel.

Below is a list of parts required for the construction of this tester, but they are only representative. Make substitutions if you desire. However, well built, accurate meters should be used for best results.

These parts are all standard and may be purchased from most any of the large Radio mail order firms such as the Wholesale Radio Service Co., of 38 Vesey St., New York City; the Allied Radio Corp., 711 W. Lake St., Chicago, Ill.; the Royal Eastern Electrical Supply Co., 16 W. 22nd St., New York City; the New England Mills Co., 128 W. Lake St., Chicago, Ill.

One Weston A.C. voltmeter model 476 range 0-4-8-150 Weston code word (Craut).

One Weston D.C. milliammeter model 301 range 0-15-150 Weston code word (Autey).

One Weston D.C. milliammeter model 301 range 0-1 Weston code word (Autogafin).

Eight push button switches marked S in the diagram manufactured by Yaxley, No. 2,004.

One double pole double throw Yaxley

push button switch No. 2,006 marked S_1 in the diagram.

One Yaxley inductance switch of the six point type No. 66B marked S_2 in the diagram.

Three Yaxley push button single pole double throw switches No. 2,003 marked S_5 , S_6 and S_7 in the diagram.

One Yaxley inductance switch of the three point type No. 33B marked S_4 in the diagram.

Two toggle switches S3 and S8.

The following resistances of the Super-Akra-ohm make should be used:

10,000 ohms, 25,000, 50,000, 100,000, 500,000, two 400,000 to make the complete 800,000 and one 8,000 ohm which is to be connected to the A.C. voltmeter.

Two four prong sockets, one five prong socket, nine binding posts, one 10 foot heavy duty cord with male plug attached for connecting to the 110 volt A.C. line, one plug made from old tube base, or (1 Na-ald No. 905 L with cap attached to the top of plug for control grid connection) one four prong adapter of the type that will fit a five prong plug, or (1 Na-ald No. 954 S adapter to fit No. 905 L plug); enabling measurement to be made on a four prong tube; one carrying case and one panel.

This is about all there is to be said about the tester except that after connecting the resistance in series with the 0-1 milliammeter, it should be calibrated in the following manner: remove the glass cover over the scale and mark on the scale with black india ink, voltages to correspond with the resistances you are using. Remember that the 10,000 ohm resistance enables you to measure up to 10 volts, the 25,000 up to 25 volts, the 50,000 up to 50 volts, the 100,000 up to 100 volts, the 500,000 up to 500 volts, and the 800,000 up to 800 volts. Therefore, you will have six scales to place on the meter. Be sure that you retain the original 0-1 milliamperes scale for indicating current values when using the ohmmeter.

If any special problems arise in the construction of this tester, we will be more than glad to help you and answer questions. Address your letters to the writer personally.



WITH WPAD

Please remove my name from the list of those who are seeking employment. I have secured a position with Radio Station WPAD in Paducah, Kentucky, as Operator and Announcer.—Carl W. Bischoff, Brookport, Ill.

Answering R. B. White

I was interested in Mr. White's letter about "noisy speakers." I've had a number of speakers that appeared perfectly centered, but still buzz or rattle. The cause I have found to lie in the fact that the pitch which is used to hold the voice coil in place becomes full of tiny cracks.

Treat these with some Duce applied with a pipe cleaner and leave to harden. "Watch out for the seams; watch out for the cracks in the pitch."—W. E. Evans, Winnipeg, Canada.

ONE OUT OF SEVENTY

I started yesterday in my new position as foreman for the Trimm Radio Company of Chicago. Out of seventy applicants for the job as foreman, I landed it. Training by N. R. I. sure pays.—A. L. Hissong, Chicago, Ill.

Muller Connects

Here's some good news from down Louisville way. Yours truly landed a job as operator at Station WEAS!

Just think! I have taken but fifteen lessons, and am "off" with colors flying high.—Chester Muller, Louisville, Ky.

KELLY SPEAKING

On an Eveready model 31 A.C. using old tubes, the volume was low. To boost the output I inserted a 112 turn coil 1 1/4 inches in diameter, No. 20 enamel wire, between the antenna lug on the set and the bottom lug of the first stage balancing condenser. Stations all over the dial came in with a volume and clarity never before equalled by this set.—Anthony Kelly, Winding Gulf, W. Va.

Hot Music

I just ran across an inexpensive way to give my customers music in every room, where the house is equipped with a "warm air" heating system.

Place an extra speaker close to the "warm air" register in the basement and your customer gets his heat and music from the same source. Be sure the register plate is firmly attached to the wall, otherwise vibration may result.—T. S. Norton, Hamilton, Ohio.

GET TOGETHER

In going through a home for the mentally incompetent, a member of the party expressed the fear that the inmates might "get together" and

cause trouble. To which apprehension the guide replied that the very reason for their plight was their inability to "get together."

Not as a matter of comparison, but as a suggestion, let's "get together" on ideas. There's not a bit of sense of keeping an idea to ourselves. Let's give it to the other fellow and get one in return. "Tell it to the Mailbag."

The "News" For Reference

Mailbag readers have their own pet methods of filing their "National Radio News" each month. I wanted to keep the service sheets and had decided to take out these pages of service data and diagrams and paste them in a loose-leaf book. But by so doing I would lose a lot of other interesting "dope" on the reverse side of each page. So when the News comes in, I make out a card for each article and file the card in a card index. The "News" is then put in a loose-leaf note book each number in the proper date sequence. By this method I can look up any article—service sheet or otherwise—in a moment's time.—Don Laeroix, Amherst, Mass.

HIGGINS FOUND IT

I had a model 52 Zenith which took me four days to find the trouble. I want to pass the dope on to the Mailbag.

Trouble: Intermittent reception. It might work for five minutes or for hours. When dead if you would try to test any part it would play normal again.

The first A.F. stage is resistance coupled with, of course, a blocking condenser from the plate of the 1st A.F. socket to one terminal of the 1st A.F. P.P. transformer, the condenser and the insulation on the outside is heavy card board. At one end is a small angle iron bracket pushed up under the outside insulation and riveted to same. The other end of bracket is riveted to the metal chassis. There is only one layer of thin insulation between bracket and tin foil. When receiver was dead the current would leak through the thin insulation to the bracket and ground the condenser.—J. Otto Higgins, Rushville, Ind.

Nice Car, Glenn!

My new Oldsmobile has been entirely paid for by Radio work. I've been at it 5 months, have a



\$1,000 car, a \$1,000 stock of Radio equipment and about \$1,000 besides. It sure is great to be in Radio.—Glenn Ryder, Charlottesville, N. Y.

RADIO TODAY AND TOMORROW

By SAM PICKARD
Vice President in Charge of Station Relations, Columbia Broadcasting System

Radio broadcasting has become so increasingly a part of the nation's life as to require at this stage no pointing finger. Some future historian may be interested in recording the growth of the phenomenon statistically. We of the Columbia Broadcasting System live very much in the present and the future. The past few months, the months to come and the years ahead are to us the important time divisions.

During 1930 Columbia grew from a chain of thirty-eight stations to a network of seventy-six covering the United States and Canada—the largest single broadcasting network in the world. Along with this growth has come a flood of testimonials to Columbia's steady rise in prestige and an expanding recognition of the system's real position by the outstanding advertising agencies and their outstanding clients. This has been a natural consequence of the improvement of the service Columbia gives to the countless millions who listen to its programs. Neither effort nor expense has been spared to provide the best in entertainment and education.

On the commercial side there has been an equally notable growth during the (Column 2, please)

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The Office Pup says—



"The Healthiest kind of 'Spring Fever' is the 'Fever for getting Ahead.'"

"The Radio-Trician who is wise is taking advantage of his competitors' 'Spring Fever' by taking business right from under the sleepy fellow's nose."

"Right now is a good time to sell customers a Radio Service Contract or an Inspection Service."

past twelve months. The Columbia Broadcasting System showed an increase of 52 per cent in volume of commercial programs broadcast in 1930 over 1929, and a record volume of business for the first quarter of 1931. Gross sales for last year increased 58 per cent over 1929.

More than 50 per cent of national advertisers now using the facilities of the Columbia Broadcasting System have renewed their contracts. Each of these advertisers has taken an average increase of 20 per cent more stations on the new contract to reach new, profitable audiences.

That is very sketchily the selling side of radio as concerns Columbia. The trend is clear; into what it will unfold only the future can tell.

For highly trained radio men the opportunities of the next three or four years will be better than they ever have been. It has become a habit to think the men who were in at the start of radio skimmed the cream. But with the intensive development of network broad-

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GRADUATE LOUIS BRUCHISS

Made European Editor of Famous Radio Magazine

Another N. R. I. graduate is well up the success ladder. Louis Bruchiss has been appointed European Editor for "Radio Industries," the official magazine of the Radio Manufacturers' Association. With a main office in Amsterdam, Graduate Bruchiss will spread his field of activities to include the entire continent of Europe and Great Britain.

Louis Bruchiss began his Radio career as an amateur, operating the well known experimental station 9CSV during 1922-5. His commercial experience began with the Mohawk Co., pioneers of the single dial control in 1924. There he was associated with Paul Chamberlain, who developed the first gang condenser capable of being balanced.

Participation in Naval Reserve Aviation led to a position with Universal Lines, specializing in shielding research. Later, Bruchiss joined the Temple organization. He assisted in operating their Canadian branch in Toronto, and was appointed Chief Engineer.

Since then, he has been occupied with the design of Public Address system equipment for Electro-Acoustic Products Co. He holds a commercial Radio Operator's license and has had experience with WIBO and WORD.

In Europe he will establish himself as a Consulting Radio Engineer, being amply fitted for this work by reason of his training, experience, ability to speak several foreign languages and his dominant ambition and initiative.

He will act also as special contact man for various American Radio interests including his connection as European Editor for "Radio Industries."

RADIO TODAY AND TOMORROW

(Continued from page 14)

casting it will be found that this is not the case.

Synchronization and television, even in their experimental stages, will call for men of highly specialized ability, and these activities will also increase the number of men needed.

Smaller stations throughout the country are more and more inclined to do a better type of technical job and more and more will use highly trained men to do it.

Station and field engineers of high type will find no lack of opportunity during the next three or four years. Their rewards will be commensurate with their ability.

FOR YOUR PROTECTION

As a student of the National Radio Institute you are entitled to use the term Radio-Trician in connection with your work and activities. When you graduate you become a Certified Radio-Trician.

The Institute by National Advertising, Publicity, Special Letters to the Radio Trade, Broadcasting and other means is making these titles better known all the time. This causes Radio-Tricians to be well known and work and jobs are the result.

For your protection, these titles are copyrighted and registered in the proper United States Government offices so that none except students and graduates of this Institute may legally use them. This protects your interests as a good Radio man. It means that you get the benefit of N. R. I. prestige—the prestige of thousands of Certified Radio-Tricians who have made good in the field of Radio.

Student Service Department BROADCASTING

N. R. I. men LOSE good, spendable DOLLARS every month—because they mail cash in unregistered letters.

Do YOU ever do this?

Why take a chance of throwing away money that you work hard to earn?

You can send money safely, by check—by money order—by registered mail.

So—why take a chance?

Whenever you send money, make sure that you are PROTECTED. Send a check—a money order—or register your letter. And, of course, BE CERTAIN to plainly write your name—your address, and your student number on everything you send.