



RICH REWARDS IN RADIO

Operating on board ship

Television

Broadcasting Stations

Commercial Land Stations

Radio Stores

Radio in Aviation

Spare time set servicing

Radio Factories

Facts about Radio's Growth and *many opportunities*

The Radio business has grown in volume from about two million dollars in 1920 to hundreds of millions today.

Approximately four billion dollars are invested in Radio of which about twenty million dollars are in broadcasting stations and two billion dollars in factories and their equipment.

Only one broadcasting station was in operation in 1920, now there are over 600.

Approximately 100,000 receiving sets were in use in 1920—now there are over 13,000,000.

Where there were a few thousand men employed in the Radio field in 1920, there are now approximately 300,000.

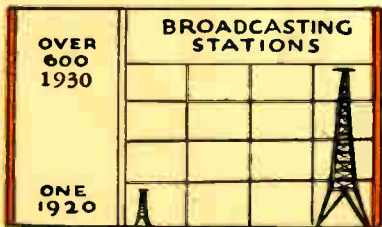
There were practically no Radio stores in 1920—perhaps a few in the larger cities—now there are over 35,000 and many thousands of other stores handling Radios as a side line.

In 1920 there were only a few manufacturers of Radio sets and parts—now there are hundreds.

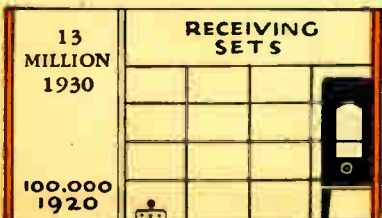
Thousands of ships are equipped with Radio—it is a world wide source of home entertainment—it is used in hundreds of different businesses and for hundreds of different purposes.



In only ten years Radio grew from a \$2,000,000 to a \$1,000,000,000 industry.



The amazing growth of Radio is further shown here. From one broadcasting station in 1920 the number has increased to over 600.



Today there are 13,000,000 receiving sets in use. These facts clearly show why there are so many opportunities in Radio.

More Facts about National Radio Institute's growth and *practical training*

From a small beginning with four students in one room scarcely large enough to accommodate that small class, the National Radio Institute grew until now it has hundreds of students and graduates in all parts of the world.

From about 3 employees in 1914, the total has grown to an average of 100.

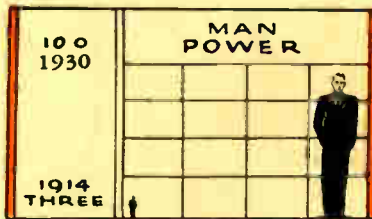
From a few feet of floor space, it has grown to 15,000 square feet.

From a few lessons to be graded and answered, the annual total lessons now submitted for grading is approximately 300,000.

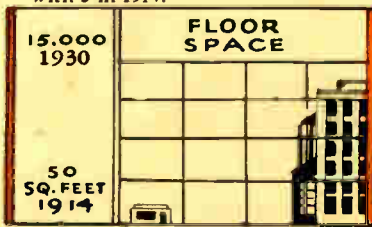
From a few hundred technical letters requesting information, the total has grown to about 20,000 a year.

From one or two graduates in the field, the N. R. I. is now represented by its graduates in almost every large Radio firm in the country.

The total yearly earnings of N. R. I. graduates in the Radio field has been estimated as close to six million dollars.



Today National Radio Institute has a staff of about 100 people employed regularly compared with 3 in 1914.



We occupy three hundred times as much floor space now as we did in 1914.



About seven hundred times as many letters from students and graduates asking for counsel and advice are answered every year.



Fifth Edition

A book dedicated to ambitious men and young men who want the facts on the **OPPORTUNITIES** in Radio and describing a practical home study training which is showing hundreds every year how to make **more money** as *Radio Experts*.

Read it carefully ---- it may mean more money and greater opportunities for **You**.

By

J. E. Smith, *President*

NATIONAL RADIO INSTITUTE

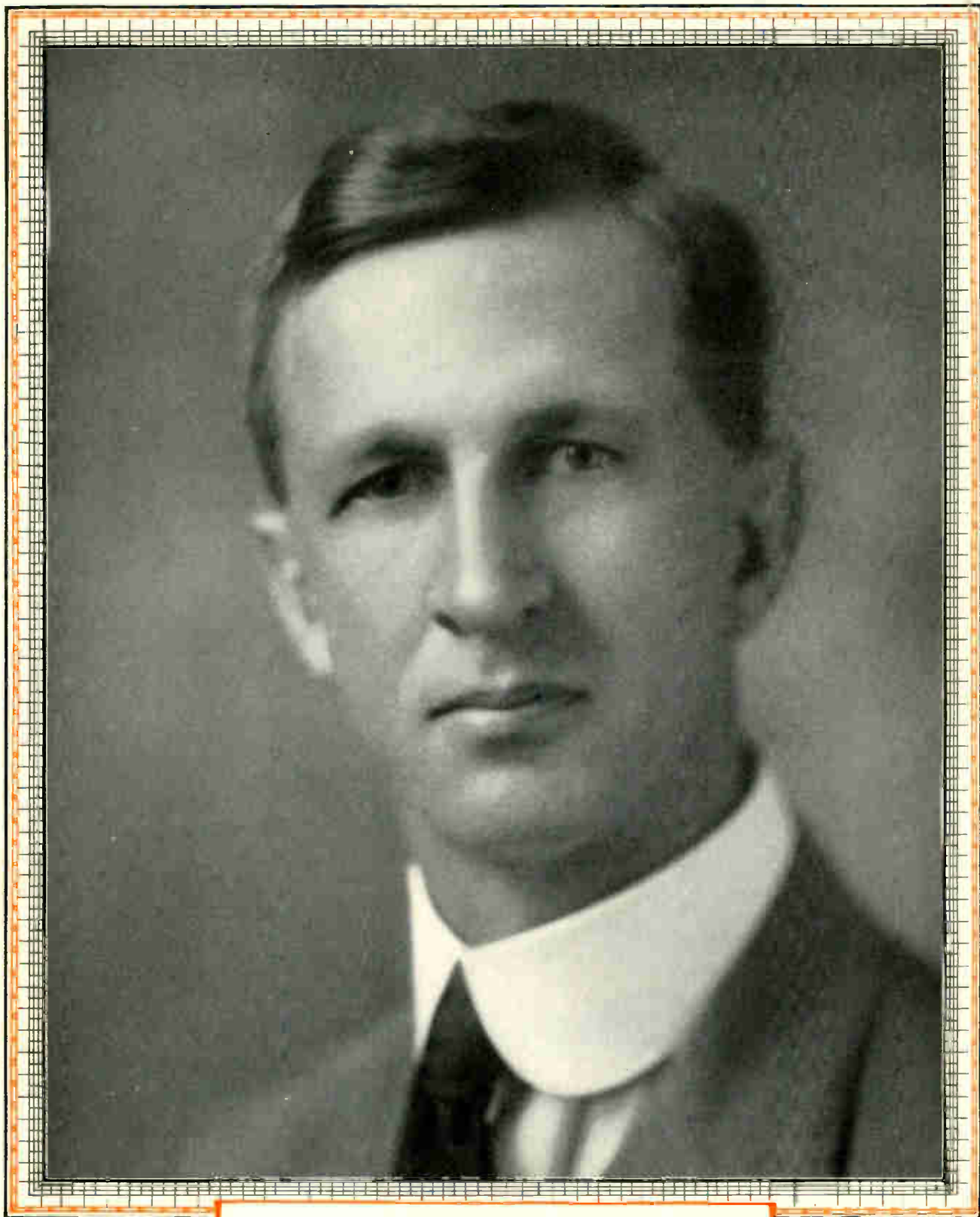
16th and U Streets, N.W.,

WASHINGTON, D. C.

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By
NATIONAL RADIO INSTITUTE, Inc.
Washington, D. C.





J. E. SMITH, *President*
NATIONAL RADIO INSTITUTE
Which he founded in
the year 1914

SHORT-WAVE BATTERY RECEIVER

QUICKLY assembled at low cost, this efficient little 2-tube battery-operated short-wave receiver, for use with a doublet antenna, will please the critical short-wave listener as well as the beginner. Anyone who can solder two wires together can build and operate it. The doublet antenna is merely two antennas hooked together, with the lead-in wires crossed over insulating blocks at regular intervals.

Standard parts are used and these are available even to the drilled panel and base. The complete set of parts, with one ready-made plug-in coil, costs \$14.70. This cost may be reduced by making your own coils. The low-drain 2-volt tubes make dry-cell operation practical and the B-batteries last many months. The circuit is the type used by Don C. Wallace, winner of the Hoover Cup awarded for DX short-wave reception.

This complete 2-tube receiver forms a foundation unit to which a second audio stage will be added for loud-speaker use. Later, the layout can be easily changed over for all a.c. operation. The

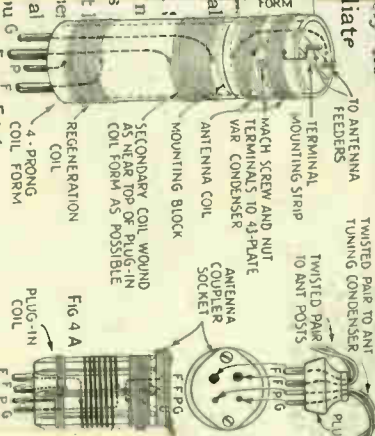
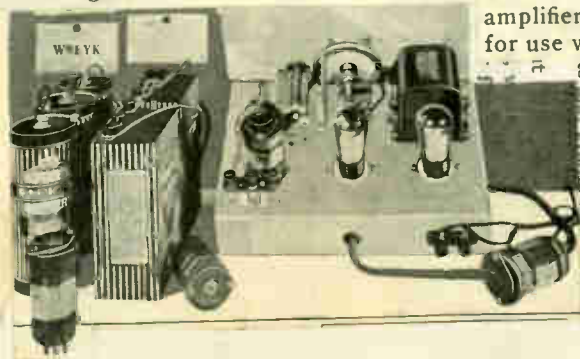
original parts are retained except for a few minor details.

The schematic diagram, Fig. 1, is given for checking purposes and for those who prefer it to the simplified, or X-ray, type shown in Fig. 2. The front panel controls are indicated in Fig. 3. The coil and tube sockets are mounted under the base, the large holes, F and F, at the left, as shown in Fig. 2. The front panel is screwed to the base and the various parts mounted just as shown in this diagram. A material list, describing each part, is available upon application if desired. The 35-plate regeneration condenser is mounted on the front panel below the base. The 43-plate antenna-tuning condenser

is mounted, with insulating washers, on the panel slightly above the base. The tuning-dial knob, at lower center, rotates a grooved disk that engages the dial which is mounted directly on the shaft of the 2-section midget condenser. The 2-plate section of this condenser is used for spreading the tuning range in crowded amateur bands.

Insulated phone posts are mounted at the rear of the base, and posts for the antenna feeders and optional ground are elevated above the base on a strip supported by metal bushings. The wiring is done under the base and run up through holes to the terminals above. Stranded hook-up wire, with push-back insulation, is used. The rotor plates of all the variable condensers are common with the frames, which are grounded on the panel, or chassis, with the exception of the antenna tuning condenser. Stator, or stationary, plates are indicated by S and the rotors by R.

Soldering lugs, for grounding the leads indicated, are placed under a mounting screw of each socket. The .00025-mfd. grid condenser and gridleak are supported away from the base, on the underside, by soldering the terminals directly to the de-



tor-socket G post. A color-coded battery cable is inserted as shown, and the leads soldered to the points indicated.

Four plug-in coils cover all ranges from 20 to 200 meters. The homemade type is shown in Fig. 4 and the ready-made variety, with the coupler plug, in Fig. 4A. The builder is advised to buy, or make, the 75 to 150-meter coil first. Use No. 22 d.c.c. wire, winding all coils in the same direction; antenna coils, 8 turns each; secondary, 28 turns and regeneration coil, 26 turns. Ordinary plug-in coil forms are used, with a short extension for the antenna coils.

Tuning directions, antenna construction, further coil data and the added audio stage, will follow next month. A large blueprint of the simplified wiring diagrams will be available at that time. The pentode amplifier unit to be described is suitable for use with any small battery receiver.

for DX Doublet Antenna

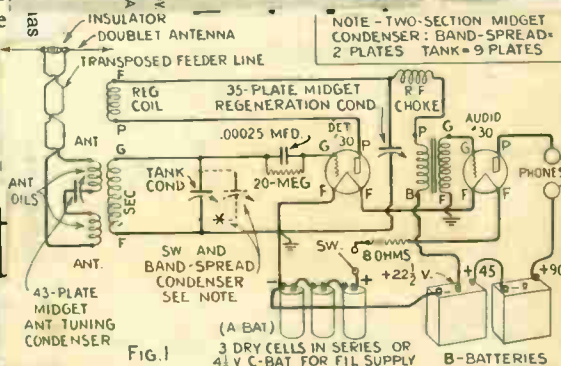
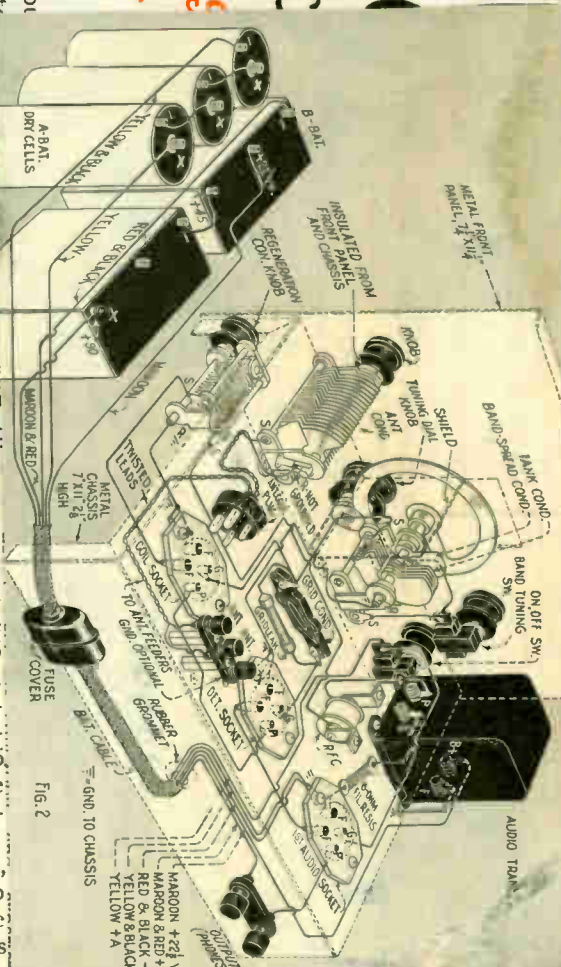


Fig. 1 3 DRY CELLS IN SERIES OR 4.5 V C-BAT FOR FIL SUPPLY B-BATTERIES

"TUNE-IN" on a big pay job and a *Bright future in Radio*



It is difficult to picture and describe the present size of the Radio industry and its many openings. Many people think of Radio only in terms of receiving sets seen everywhere. They fail to understand that behind these sets, and in many and varied capacities, there is an enormous body of skilled, trained men—men who make up the new Radio profession—a field that can absorb many more well-trained men.

Most people fail to realize that the manufacture and sale of sets is only one of the many branches of Radio offering rich opportunities. Broadcasting, for example, is a big field of opportunity employing thousands of trained, skilled men. The use of Radio on board ship requires thousands of trained operators. Those are only a few branches of opportunities. Later in this book I will tell you about many more.

Naturally when a man or young man is face to face with choosing his life's work, or has seen the need of changing over from one line to another because of lack of opportunity where he is, he wants to gather all the facts he can to be able to make an accurate decision. The purpose of this book is to outline the opportunities in the different branches of Radio. I want you to remember, as you read it, that a book five times this size could not possibly cover them all. I have given you as many facts and as much information as space permits.

In addition to entering a field where opportunities exist for a good job after his training has been completed, every man wants to make sure that he has



(Courtesy Wide-World Photos)

Herbert Hoover, Jr., enters Radio

With his father in the most important office the Nation has to offer, Herbert Hoover, Jr., could probably have entered any field of business he wished. His father's influence would have opened the door to any industry or profession for him.

With all the business world to choose from, the President's son chose Radio. The possibilities of this industry must have attracted him more than the other good jobs he could have had. He has been Radio Communication Specialist for the Western Air Express. Opportunities that attracted the President's son are within the grasp of any man who has specialized knowledge of Radio. This is a new, live field giving employment to many trained Radio men.

More than \$400 a month



Radio Station KYA,
San Francisco, Calif.

Dear Mr. Smith:

I really believe that every man should take your course in Radio as there is every chance in the world for a man, if he has anything in him at all, to get some place, as the opportunities in Radio are unlimited. The Radio field is getting bigger and better every day. I had 15 years as traveling salesman and was making good money but could see the opportunities in Radio. Believe me, I am not sorry, for I have made more money than I ever did before. I have made more than \$400 each month and it really was your course that brought me to this. I can't say too much for your school.

Yours very truly,
J. G. DAHLSTEAD

good opportunities to win advancements and promotions. I believe you realize how small your chances are in a business or profession that is standing still.

This book will prove that Radio is not that kind of a business. It has grown fast, exceedingly fast, but its biggest growth is still ahead. I will prove this to you in this book. So I say, get in this field now—get one of the good jobs that pay \$40, \$50, \$75 a week—make one of them your goal. With my training to back you up, you should be able to make good easily, and you will have many opportunities to go up in salary and position with the growth of Radio.

You'll find Radio work extremely fascinating and interesting. There is something about it that grabs your interest and holds it. Besides you will have a wide choice of opportunities. The many different branches mentioned in this catalog each have within themselves many different types of jobs. I am going to tell you about them, so be sure to read every page of this book.

And I am going to tell you about my course—what I offer you and show you what it can do for you, because of what I have done for others. You need not take my word for it when I tell you that my course fits you to make good money in Radio. You have the word of hundreds of my graduates who know what this training did for them and can do for you. Be sure to read every one of the 100 letters from graduates scattered through this book. They show exactly what N. R. I. trains you to do and make. And as you read these letters, remember that I have a better, more thorough course of training today than I had when these men enrolled with me. My course has been revised, improved, enlarged. So your chances of success are even better today than when these men enrolled with me. And the Radio field is big enough to absorb many more well trained men every year.

Amazing Growth of Radio *has made* Thousands of Good Jobs

Just see how the Radio business has grown

You read earlier in this book how the number of broadcasting stations increased from one in 1920 to over 600 at the present time. How the number of Radio dealers, jobbers, Radio manufacturers have increased many times over in this short space of time. How Radio has invaded many industries and is serving many purposes. As an entertainment force it is world-wide. Commercially it is a business necessity.

This amazing growth could have had but one result—the making of hundreds of fine jobs. Many N. R. I. men stepped into these good jobs and made good money. As Radio continues to grow many more will be needed for jobs paying \$40, \$60, \$75 a week—jobs with a future—jobs which may lead to \$100 a week and more.

While Radio has developed far more rapidly than most any other industry, many untouched opportunities are still ahead. Surely common sense tells us that more people can afford Radios than can afford to own a car. At the present time there are approximately twice as many automobiles in use in the U. S. as there are Radio sets.

In these figures you see the reason why far-sighted Radio manufacturers have expanded their plants—why Radio sales have jumped from \$2,000,000 to hundreds of millions—why Radio is a live, attractive industry for you.

General James G. Harbord in an interview published in several leading newspapers predicted that:—Television

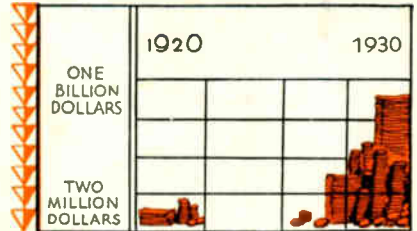
will supplement sound broadcasting—soon we will see as well as hear Radio entertainment:—Home Talking Movies will be an outstanding development of the next few decades:—A vast expansion in Radio circuits and traffic volume impends—short waves will provide many more channels:—With increased communication we may send Radiograms to all parts of the world:—Photographs, drawings, fingerprints and commercial documents will be flashed across oceans and continents.

That Londoners will read New York newspapers the same day, whole newspapers being flashed all around the world. That Radio Telephony as a public or toll service is certain to thrive during the next 20 years. That Radio as an art and science offers a most attractive field of endeavor for young men and women.

Starting early made many rich

Back in the early days of the automobile business, Henry Ford was a mechanic making \$3 a day. Now he is the richest man in the world. Think of some of the tremendous fortunes that have been made, the enormous concerns that have grown up in the automobile industry—General Motors, Hudson-Essex, Packard, Ford and others.

Today you have the same opportunity in Radio you could have had by starting in the automobile industry years ago. Roger Babson, the famous business authority, says: "Our next crop of millionaires is coming from Radio."



No wonder Radio offers so much to the well-trained Radio Expert. This chart of Radio's growth shows the reason.



KDKA—the first broadcasting station as it appeared in 1920. Compare it with the photograph below.



Interior of a section of a modern broadcasting station. Notice the intricate and expensive equipment compared with the photo above.

Making \$3000 to \$4000 a year in his own business



my own and am making lots of money. I have the exclusive franchise for a number of sets and also do repair and service work. Your course has earned about \$3000 for me and if nothing happens I will clear from \$3000 to \$4000 from my business this year. My business is getting better all the time. I am making about four times what I was making before I took the N. R. I. course. If it had not been for the course I would still be fooling around with Radio without knowing what it is all about.

Dear Mr. Smith:

I was delighted to receive your letter and to hear from you and to know that you are still interested in me as I finished my course with you quite some time ago. I enjoyed your Radio programs very much. Your talk was especially interesting. Mr. Smith, I have opened a store of

Sincerely yours,
WILLIAM E. RIDDLE

Has made more than \$10,000 in Radio

1535 Slade St.,
Fall River, Mass.

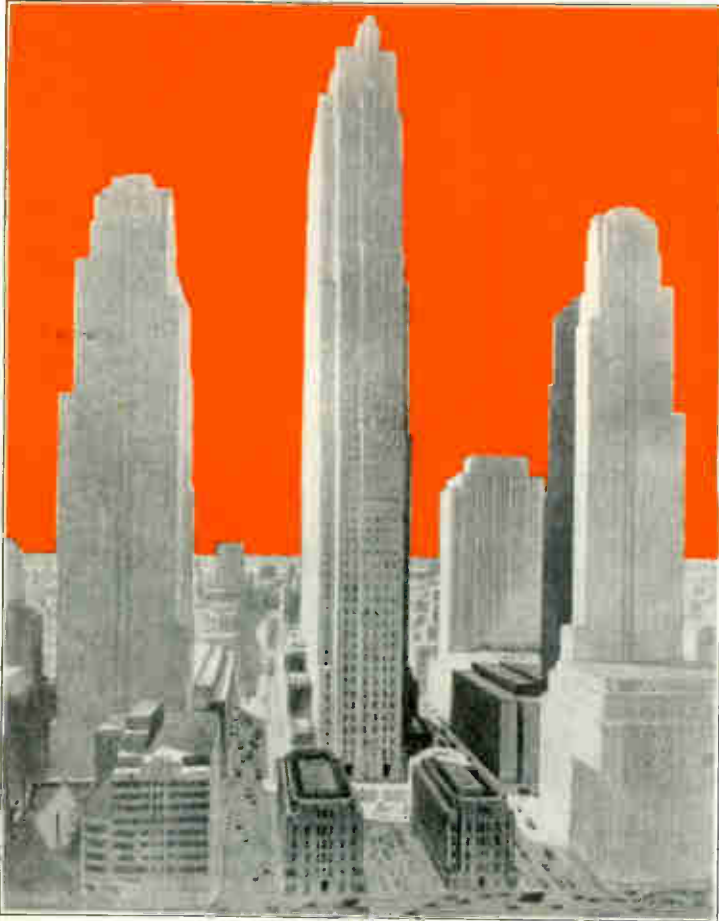


Dear Mr. Smith:

It is a pleasure for me to write and let you know just what your training has done for me. Some three or four years ago, previous to taking your course, I was working in a garage—a dirty job, at low wages and small chance for advancement. Dissatisfied, I enrolled in your school and before I was on the tenth lesson I had more sets to build than I could handle. In a few short months I had made enough money to pay for the course three or four times. Through my knowledge of Radio, I got a job as service man at one of the leading Radio stores in town. Today I have graduated from your school and am head service man at a salary of \$65 a week—unafraid to tackle any jobs that come along. Altogether I have made over \$10,000 in Radio. Summing this all up, Mr. Smith, enrolling in your school has changed the whole trend of my life. It has given me a good job and made me independent.

Yours sincerely,
JAMES E. RYAN

DEVELOPMENTS *like this* forecast a **BRIGHT FUTURE** for **YOU** in Radio



Courtesy of Wide World Photos

RADIO CITY

Radio City will occupy the property between 5th and 6th Avenues and from 48th Street to 51st Street, in New York City. Who knows—maybe you, some day, will play an important part in the presentation of programs in and from Radio City. Since Rockefeller is willing to risk a quarter to a half a billion dollars on Radio's future, surely you should be willing to back your future in Radio with the little time and money needed to prepare yourself.

No matter what your personal inclinations or desires may be, I believe that Radio can satisfy them. It is a big field—big enough—broad enough—to offer you all the opportunities you could possibly want for interesting, fascinating employment and for good pay. There is hardly a business or profession that Radio does not touch in some manner. I cannot begin to name all your opportunities in Radio. If you long to travel, Radio operating on board ship will appeal to you. You can travel all over the world, at practically no expense, and earn a good salary besides. Perhaps broadcasting is more to your liking. Perhaps you like to design, develop, create. Then experimental and research laboratories are the place for you.

Perhaps you are mechanically inclined. Radio dealers, jobbers, manufacturers are the place for you. Perhaps you like to sell?

Isn't it significant that the largest single construction undertaking in America is one devoted to Radio interests? The photograph on the left was made from the architect's drawing of "Radio City"—a city within a city—now being built in New York City. This magic city of unusually designed structures will be dedicated to electrical entertainment, including the most advanced types of broadcasting equipment and studios. In addition, two huge theatres with seating capacities of 4,000 and 6,000 people respectively, will be wired for Television programs.

Many new ideas in studio design and construction have been planned. Some broadcasting chambers will be more than three stories high and will be Radio auditoriums rather than Radio studios. Elaborate facilities for visitors' galleries from which program presentations may be observed through sound proof plate glass will be provided. A large staff of Radio engineers, operators and maintenance men will be needed to carry on the work of this giant center. The most radical Radio enthusiasts could not wish for a more definite expression of confidence in the future of Radio. Men who have, and those who will choose Radio as the field for their career, can well feel that the industry has firmly established itself in a commanding position of entertainment and utility. Of special significance is the fact that this huge development is a Rockefeller undertaking. Members of the Rockefeller family have long been known for their shrewd business judgment. They must believe the Radio business is going to grow much larger, or they wouldn't be investing \$250,000,000 in this undertaking. Radio has gotten along pretty well in its present buildings. They must expect it to grow and expand or they wouldn't build new and larger buildings.

Again Radio dealers, jobbers, manufacturers, broadcasting stations and other Radio branches should appeal to you because they all need men with selling ability from time to time. Do you like thrills, excitement? Aviation is employing more and more trained Radio men. Do you like to write? Hundreds of newspapers have Radio departments.

You are going to find that the best things said about my Course in this book were not written by me, but instead were written by graduates—men who have taken my Course and who want to let you know their experience with it.

Read this book. It gives you what I believe to be a fair picture of Radio's future possibilities and your opportunities in it. If you are ambitious, if you want to get ahead, and I believe you do, you cannot afford to overlook what Radio offers.

Read what these graduates say

about the *bigger money* they are able to make in Radio - - - - - as a Result of N. R. I. Training

Well over \$5000 last year

3649 Solar Vista Place,
Cincinnati, Ohio.

Dear Mr. Smith:

I have put N. R. I. training to a number of tests. First, I went to work for Stewart Warner in Detroit, doing engineering work. I was practically in charge of the branch, supervising all technical work. Some time ago I left to go with the C. & D. Auto Supply Co., Steinite Distributors. Here I am Sales Manager.

I am pleased to tell you that last year my income went very much over \$5000. I am not sure that many of your graduates jump from one end of Radio to the other—from engineering to the selling end—one where thorough, accurate and complete technical knowledge is necessary and the other where selling and merchandising knowledge is required. I am certainly glad I took your course, as it served a good basis upon which I was able to build a successful future.

Yours very truly,
ERLE L. CHAMBERS



At least \$4000 this year

1023 Railroad Ave.,
Perry, Iowa.

Dear Mr. Smith:

I would most certainly advise a man to study Radio either for spare time or full time work. My present work is much more congenial and not nearly as hard as my previous occupation as a locomotive fireman. My income has been made before.

I made enough the first year above my regular salary to buy a new automobile and my increase in income has just about doubled each year since completing the course. You can see from these figures that my investment in your course has paid me a very high rate of interest. I have a Radio shop of my own, well equipped with the latest testing equipment and had a very nice business last year. I believe my earnings will run at least \$4,000.

Yours truly,
HARRY LABORDE



\$17,000 home, three cars and his own business

922 Church St.,
Evanston, Ill.

Dear Mr. Smith:

At the time I started your course, I had only a grammar school education and knew nothing about electricity or Radio. After three months I obtained a job in a Government Wireless station. Within a year I was in complete charge of this station and the possessor of a first class license.

My next position was as factory foreman in the Radioceptor Co., where my salary was based on output, averaging \$500 per month. Later I came to Evanston and took the position of service manager for the North Shore Radio Shop. Then later I purchased this company outright. Business is good, and Uncle Sam has one more income tax source to collect from.

Everything I have now can be attributed to your training. I own a \$17,000 home, three cars, my own business and am permanently established here. Without your training I would probably be among the army of unemployed—as it is, I have never had to hunt for a job since I took the course—the jobs hunted me.

A grateful grad,
EARL R. BENNETT

**Earnings increased 100%
Holds responsible position
as Service Manager**

1511 Guilford Ave.,
Baltimore, Maryland

Dear Mr. Smith:

After a number of years experience in Radio, I felt the need for additional knowledge. I carefully investigated several schools offering instruction in this subject and decided that the National Radio Institute had the most to offer. I found the course interesting and instructive. The texts are so clearly written that anyone who has a grammar school education should have no difficulty in successfully mastering it.

Upon completion, I became Radio Service Manager of Parks and Hull, Inc., Atwater-Kent distributors. When the Atwater-Kent agency was taken over by Southern Wholesalers, Inc., I immediately secured the same position with them.

I feel that my success in Radio has been due to the excellent instruction I received from N. R. I. The course immediately increased my earnings 100% and placed me in a position of responsibility. I would strongly advise any service man who has not had recent technical training to take a course in Radio if he wishes to survive.

Very sincerely yours,
J. E. McLAURINE

**Earns between \$2,500
and \$3,000**

2320 Maple Street,
Little Rock, Ark.

Dear Mr. Smith:

My earnings in Radio range between \$2,500 and \$3,000. I am in Radio exclusively now—have a much better income, 85 per cent of which is directly traceable to my National Radio Institute training, and my work is a thousand times more pleasant and congenial than before. I successfully completed a transmitter of 250 watts (designed to operate to 1000 watts) for Station KGJF from the information and knowledge I got from the N. R. I. Course, and later became the manager and announcer of this station. Recently, I annexed the coveted contract for the Public Address System at our new ball park and athletic field.

I feel that your training has pulled me out of the rut of a daily grind into the wide road of an ever developing future. Tell your prospective students to write to me if they are not convinced of the merits of your Course.

Sincerely yours,
K. W. GRIFFITH





OUR OWN HOME

This building is owned and entirely occupied by the National Radio Institute. The first floor is devoted to storing students' instructional material, the Mailing Department and Printing. The second floor to Executive offices, Student Service Department, Accounting and Mail Opening Departments. The top floor to the Instruction Department, Stenographic and Typing Departments and our Laboratory devoted to experimenting and developing our home laboratory outfits.



OUR ORGANIZATION

Limited space permits me to show you only four interior views of the Institute. Upper left is a section of our Student Service Department. Upper right our Typing and Stenographic Department. Lower left part of our Instruction Department and lower right our Multigraphing and Printing Department where model answers and other student supplies are printed. Directly to the right—the key men in my organization in a group photograph outside our building. Our entire organization is devoted exclusively to training men and young men for good jobs in the Radio field.



The World's **F**irst and **L**argest

Home **S**tudy **R**adio **T**raining **O**rganization

Naturally you want to know about the organization behind the course I am offering you. It is not very likely that any training will be any greater, more thorough, or complete than the Institute giving it. Organized in 1914, the N. R. I. is the Pioneer and World's Largest Radio Organization devoted exclusively to Radio training by home-study methods.

I am proud to be able to say that many of my key men have been with me for over 10 years. The valuable experience which they naturally would get with me during that long period of time, are drawn on by the Institute in giving what many believe to be the biggest value in Radio training in the world for the money. By concentrating on Radio alone, we believe we are better able to give our students what they need and want to succeed. I believe organizations are like men—when they divide their time between several propositions, all of them are going to suffer. When they concentrate on one, specialize in it, they are going to become expert.

References

For your information I wish to say that we are members of the National Home Study Council, 839 17th St., N. W.; Washington, D. C., and in addition the

Washington Chamber of Commerce; the Merchants and Manufacturers Association, all of Washington, D. C. For our financial standing you may have your banker look us up in Bradstreet or write the U. S. Savings Bank or the Federal-American National Bank and Trust Company, both of Washington, D. C. You may write any Radio Magazine about our reputation for fair dealing.

The N. R. I. was the first to teach Radio by mail—we became the leaders in home-study Radio training in 1914 and have maintained that leadership ever since. We are not a subsidiary of any Radio Corporation, thus we stand on cordial terms with all. All our resources, all our time, the full time of all our employees are devoted to training men and young men for the Radio industry—to serving our students and graduates.

I invite you, any time you are in Washington to drop in and meet the whole Staff. I, or one of my associates, will be very glad to show you around the school, explain our methods, let you meet my Department Heads, talk to them, see how we handle Lessons and letters—satisfy yourself that our methods are efficient and fair.



New Department of Commerce. This Department formerly prepared the regulations governing Operators' licenses.



U. S. Capitol where Congress meets. The center of many debates on Radio legislation.



Bureau of Standards. Extensive Radio experiments are carried on here.



(Courtesy Associated Press.) State War and Navy Building. The Army and Navy use Radio extensively.



Arlington (NAA) powerful Naval Radio Station just across the Potomac River from Washington.



National Press Building. The home of the Federal Radio Commission.

The Only School Whose Graduates are Recognized as Certified **RADIO-TRICIAN**s

Interesting facts about N. R. I. that no one else can match

We grade over 300,000 Lessons every year.

We answer over 20,000 letters from students and graduates every year requesting technical and other information.

We maintain a Staff of about 100 people—more than any other organization of this kind.

Our building is located on 16th Street—one of the most beautiful and prominent in the Nation's Capital.

Fully 75 per cent of all letters are answered and lessons graded within 24 hours after being received.

N. R. I. graduates are to be found high up in the Government Service and in the employ of almost every large Radio concern in the United States.

Members of the Radio Commission, men high up in Government Radio circles, many other men honored in Radio for their accomplishments have done us the honor of visiting our Institute.

Our location is a distinct advantage to you

Washington is the very heart of Radio—the laws governing broadcasting and commercial communication are made here. The requirements for a commercial license are decided here. The great wealth of information gathered by Government experimental stations, the Bureau of Standards and other Government Departments, as well as many private Radio companies and experimental laboratories are within our easy reach. Some of our neighbors, factors in the growth and development of Radio, are pictured on this page. Below I am listing 16—all of which have contributed something to Radio's growth.

- | | |
|----------------------------|------------------------------|
| Bureau of Standards | United States Capitol |
| Department of Commerce | Department of Justice |
| The Navy Department | Coast and Geodetic Survey |
| Naval Research Laboratory | U. S. Coast Guard |
| Civil Service Commission | Forest Service |
| Patent Office | Arlington Radio Station |
| The Treasury Department | National Museum |
| The Post Office Department | National Academy of Sciences |

My Course fits you for fascinating big pay jobs with Broadcasting Stations

There are over 600 broadcasting stations in the U. S.—all of which employ one or more trained men. The larger stations employ as many as 30 to 50. There are so many different jobs in a broadcasting station that it is difficult to name them all. They vary in different stations depending upon their size and importance. In the case of the larger stations there are several announcers, program managers, chief operators and operators' assistants at transmitters, chief remote operators and their assistants, mechanics and electricians. Men trained for this work earn good pay, some make as much as \$4,000 a year.

The work is fascinating, you will find it a pleasure. You mingle with famous statesmen, financiers, actors, opera singers, authors—the most notable persons of our time. The highest and mightiest in the land turn to broadcasting stations to get their messages to the public. You may have the chance to attend many

interesting events. World series baseball games, political conventions, prize fights, sporting events of all kinds, call for trained men to attend the apparatus.

Broadcasting has expanded and grown tremendously. The first broadcasting took place from KDKA in 1920 when the returns from the Presidential election were sent out. In less than 10 years broadcasting stations have increased in power from five watts to 50,000 watts for some of the larger stations. Stations of this size represent a tremendous investment of money and demand the services of a large body of trained men. It is estimated that as many as 20,000,000 to 30,000,000 people listen-in on events of great national interest such as a Presidential Inauguration. Many N. R. I. graduates are now successfully employed in broadcasting stations. About 100 Broadcasting stations have employed N. R. I. graduates.



Has charge of transmitter at Station WMPC.

"After completing the first twenty lessons of the N. R. I. Course, I secured my license as a Radio broadcast operator. I immediately joined the staff at WMPC as Operator and have since been put in full charge of the transmitting apparatus. I appreciate very much the personal interest which you and your staff have taken in me. I credit about \$2,000 of my earnings to the benefits derived from N. R. I. training."

HOLLIS F. HAYES,
163 Monroe St.,
Lapeer, Mich.



Chief Engineer of Station WJTL

"I thought perhaps you would be interested in my latest advancement. I am now Chief Engineer of WJTL, the 'University of the Air' Station, at Oglethorpe University, Ga. I am well pleased with my position, as the work is quite interesting and pleasant. I can't thank N. R. I. enough—the training given me has put me where I am, and with the co-operation received since finishing the course, I expect to keep climbing. The National Radio Institute deserves all the credit."

FRANK A. PARKINS,
Station WJTL,
Oglethorpe University, Ga.



Special broadcasting apparatus installed in the U. S. Capitol for broadcasting President Hoover's Inauguration Speech



Section of a large broadcasting station studio



The heart, lungs and nerve center—the control room—of a broadcasting station. Engineers are constantly alert for flaws or defects in programs



Main Operating Room of WENR.
Operator at the transmitter of WSM. Only trained men are trusted with the expensive apparatus in a broadcasting station



I will train you at home for many fine jobs with Radio Dealers and Jobbers

At present there are over 35,000 Radio stores and over 1200 jobbers in the U. S. It is estimated that 13,000,000 receiving sets are now in use in the U. S. alone. If Radio offered no other opportunities than the work of servicing and repairing sets, supplying new parts and accessories—this one branch alone would offer all a man could want in opportunities for a good job or a business of his own. There is a market right now for millions of Radio sets, to replace obsolete models still in use and to equip those homes which do not have Radio sets.

The Radio set and parts manufacturers distribute millions of dollars worth of their products through these Radio dealers and jobbers. I need not tell you that activity like this, business volume running into millions of dollars every year, offers many opportunities—open many fine jobs every year.

More than at any time in Radio history, set owners are demanding good service work, good installations. There was a time when most any man could get a job installing and servicing sets. Sometimes it was the butcher boy, sometimes the automobile mechanic who knew a little about electricity. Set owners were satisfied just so they heard something. But now they want good tone quality and faithful reproduction.

As a result many men who have entered the field without a thorough training are being put out of their jobs as fast as competent men can be found to take their places. This replacement alone is opening many fine jobs, not to mention the continued growth and expansion of this branch of Radio. During the past few years, Radio stores have increased from 28,000 to over 35,000—and there are hundreds of towns that still do not have well

equipped Radio stores but must have them soon.

N. R. I. graduates, in large numbers, are entering this branch. Their training fits them thoroughly to understand all types and models of sets. Some earn as high as \$50 to \$100 a week, after completing my training, compared with \$20 to \$30 a week salaries they were making before. You'll find all through this book that my course is practical—its one purpose is to fit you to make more money.

When you read the outline of my Course given later in this book, you will see that N. R. I. has given special attention to training in set servicing. I don't mean simply the assembling of the set or taking out one part and putting in another, but training in fundamental principles—the principles used in the construction of various types and models of sets—principles which you must know in order to do a good job.

Training like this not only fits you for jobs with Radio dealers and jobbers, but for a spare time or full time Radio business of your own. Every community—your very neighborhood—no doubt offers many opportunities to make money working for a dealer, or to have a spare time or full time business of your own.



Does repairing for 23 stores

"I have made over \$2,000 in Radio since I took up your course and I am giving you all the credit for it. Right now I am in charge of a shop doing repair work for 23 auto supply stores. It keeps me plenty busy but with your training I have been able to repair anything that has come my way. For a square deal and a good Radio training I don't believe N. R. I. can be beat."
B. D. BAILEY,
Box 431A, R. #1, Edgewater, Colo.



Service Manager for large Distributor

"I want to congratulate you upon offering such a practical course in Radio. I secured a good position immediately after graduation and have been advancing upward ever since. At present I am Service Manager of the Wilks Distributing Company, Sparton distributors for the State of Michigan. N. R. I. lifted me into a good position."
DALE H. HOAG,
1040 E. Genesee St., Saginaw, Mich.



Manager of Radio Department

"I will never regret the money spent in taking your course. Radio is the best field today. I am now Manager of the Radio Department of Mr. Charles P. Maier. I do all kinds of Radio repair work on all types of sets. I also do spare time work and average from \$25 to \$35 a week from it."
ALOIS R.
ABENDSCHÖEN,
23 Eder Terrace,
So. Orange, N. J.



Selling sets is pleasant and profitable work. Modern stores provide very congenial surroundings. Salesmen usually work on a salary and commission basis.



In John Wanamaker's Store, of which this is an interior view, the salons are decorated and arranged to show customers how the various types of Radio sets actually look in the home.



Gustave Vasen, an N. R. I. graduate, testing and servicing a Radio set.



Radio Factories



Lands job with Philco after ten lessons

609 Green Street,
Philadelphia, Pa.



Dear Mr. Smith:

My enrollment with the National Radio Institute has been one of the most profitable investments I have ever made. After finishing my first ten lessons I had enough confidence in my ability to apply for a position with the Philadelphia Storage Battery Company, makers of Philco Radios, and I was hired immediately. I am now one of the employees of the Radio Laboratory Department, and my work consists of the construction and maintenance of Radio sets and speaker testing equipment. In my spare time I sell and service Radio sets. I can truthfully say that since starting my Radio course, I have made at least \$1,000 in addition to my regular pay.

Very truly yours,
SAUL D. GILLES

The photograph on the right is the Stewart-Warner Speedometer Corporation, large producers of Stewart-Warner sets. Large plants like these need trained men almost continually.



Responsible position with large corporation. \$950 in five months

334 Dean St.,
Brooklyn, N. Y.

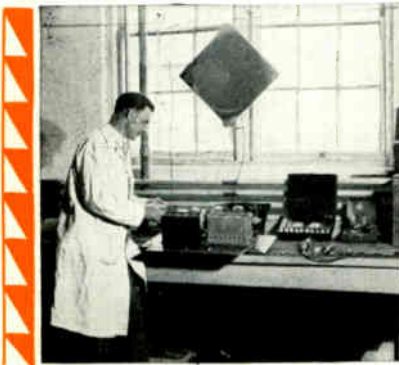


Dear Mr. Smith:

When I enrolled as a student, I did not know any more about Radio than tuning the stations on the dial. Now I am able to build any make of battery operated or electric set, besides installing, repairing and testing, thanks to the training I received from N. R. I. I made about \$950 in Radio in five months and since I graduated, have been holding a position as Radio inspector with a large Radio corporation in New York, doing mechanical and wiring inspection on complete sets. In a year of depression, considered very poor for business, I have a larger income than any year before. Television will be here soon and I am sure that we will have another "boom time" in Radio then. My suggestion to ambitious men is that they prepare. For this, I recommend the N. R. I. Courses, as they are thorough and easy to understand.

Yours truly,
JOSEF ENGLUND

Radio Factories Employ Thousands of Trained Men



There are many types and varieties of jobs with Radio factories. This photograph shows H. A. Wilmoth, an N. R. I. graduate, testing a receiving set.



Over \$60,000,000 worth of tubes were sold in 1931. This photograph shows two men testing tubes in a large manufacturing plant.

The jobs in factories are many and varied. Some of the larger plants employ several thousand people. Atwater Kent, Stewart-Warner, Grigsby-Grunow, Crosley, General Electric, Westinghouse, Philco, R. C. A., Victor, Sparks-Withington—to name some of the larger factories—employ a large number of trained men at splendid salaries. The work with Radio manufacturers appeals to many. There is something satisfying about knowing that you have played a part in producing a highly popular set found in hundreds of homes.

Let's look inside a typical factory. Before a set is ready to manufacture, it must be designed by expert engineers. Then models are built and thoroughly tested. So much money is involved in making a set that every detail must be exactly right before production is started. That is why the men who have the responsibility of designing sets draw such good salaries.

There are many problems to work out. The many different parts—panels, dials, condensers, coils, wiring, power packs and others do not fall into their places. An

immense amount of research work and experimenting is required to produce a good set that will sell within a popular price range.

Once a set is in production it comes under the watchful eyes of men of skilled trained ability—production managers, mechanics, assemblers, testers. Even after the set has been made it is not yet on the market. It must be distributed. To get it in the hands of dealers and jobbers requires promotional men, salesmen and service men. That briefly is a word picture of the making and selling of sets. It is a picture of many fine jobs all down the line from the maker to the buyer.

Production managers make up to \$5,000 a year and more. Mechanics up to \$50 a week and sometimes more. Service managers up to \$4,000 and \$5,000 a year. Superintendents and inspectors up to \$4,000 and \$5,000 a year. Engineers frequently make as much as \$7,500 a year. Salesmen and traveling service men receive as much as \$4,000 a year. Since there are hundreds of Radio manufacturers of sets and parts for sets, you will realize that there are many excellent jobs in this branch of the Radio industry.

Earn While Learning

Made \$800 in spare time

"Every word I ever read about your course I found to be true. I have made about \$800 in my spare time. Money could not pay for what I got out of it. My work in the Reading Car Shops keeps me away from home from 6 a. m. to 7 p. m. You can see that I have little time but still I am making good money on the side. I didn't know a single thing about Radio before I enrolled and now I am not afraid to repair or build any type of set. I cannot thank the N. R. I. enough for the great help they gave me throughout the course."



MILTON I. LEIBY,
Topton, Pa.

\$350 in one month

"Armed with my business cards, I applied for a Radio job at one of the largest department stores here. They took me on and in four months my income averaged \$50 per week in spare time. My best week was \$116.40 in March, and during the whole of that month I made \$350. I am regularly employed on a newspaper from 5 P. M. to 1.30 A. M., so the Radio work was done in the few hours that I had during the day and one night a week."



JAMES S. RUSSELL,
2412 Wright Ave., Greensboro, N. C.

Many N. R. I. men have started to earn good money shortly after enrolling—\$5, \$10, \$15 a week extra in spare time servicing sets

Read the letters on this page. They are only a few of the hundreds I have received from students who earned good money servicing sets on the side while learning. Fortunately for you there is a need in almost every community and neighborhood

for men who know the "how" and "why" of receiving sets.

Of course, the man who has not been trained in this work—the man who does not know "how to do the jobs" or who has not been trained "how to find them" usually is not quick to see these opportunities. N. R. I. not only shows you how to do the jobs but also how to find them.

The number and variety of jobs is interesting and varied. It is surprising how many Radio sets are only working about 40 per cent efficient because of faulty aerials, wrong or run-down tubes, damaged or partly worn out batteries. Most of my students by following the information I give them for doing and getting jobs, are able to open small shops of their own in their basement, in the attic or garage shortly after enrolling.

Many of them on the other hand, work during spare time for Radio stores. Usually there are one or more Radio stores in the average community that do not have enough work to employ a service man full time, or which have an overflow of jobs during their busy season. Read the letters on this page. They show better than I can tell you how much can be made in this work in spare time. I'll do as much for you as I did for these men.

Some of the many jobs I'll show you how to do correctly for extra money

Rewiring receivers for screen grid tubes; rewiring of battery sets for A. C. operation; rewiring of battery sets for D. C. operation; the erection of antennas; tube testing; testing of audio amplifiers; testing of Radio frequency circuits; installing phonograph pick-ups; repairing batteries; installing A, B and C eliminators in place of batteries; rewiring receivers; constructing custom receivers from kits; building short wave receivers; building and installing short wave adapters; repairing power packs; replacing filter condensers; reducing hum in receivers; installing by-pass condensers; neutralizing Radio frequency stages; removing distortion in power amplifiers; increasing the selectivity of receivers; installing public address systems; eliminating interference; installing receivers in automobiles; eliminating interference in apartments; wiring of apartment houses for Radio; building and installing wave traps for receivers in congested areas; converting tuned Radio frequency receivers into super-heterodynes; constructing set analyzers; building resistance blocks for operating battery sets from 110 volts D. C. supply; installing dynamic speakers; adding tone control in receivers; improving the acoustics of a room; removing microphonic noise in receivers; building power amplifiers; rewiring receivers for Pentode tubes.

Earned \$651 while studying. Now runs own shop



"My part time earnings while taking the N. R. I. course were \$651 and since graduating, working full time, approximately \$1576. At the present time I have my own shop doing repairing and building of electric sets, and service work out in the field. I have the agency for selling and installing auto Radios. All of my success I owe to the National Radio Institute. I think it is the greatest and best Institute in the world."

FORD R. LEARY,
1633 Davison Road, Flint, Mich.

Farmer does Radio work in spare time

"I am operating a hundred and twenty acre farm which keeps me pretty busy during the day time. Three nights a week I teach a class in Radio, which takes two hours of each of those nights and on the other three nights I usually have service calls to make. Words cannot express my gratitude to and respect for the National Radio Institute. I am more than satisfied with your training—it prepared me to earn nice sums of cash in spare time instructing and servicing. The value of the contacts I have made both in a social and business way and the pleasure derived from my Radio work cannot be expressed in dollars and cents."



HOYT MOORE,
R.R. No. 3, Box 919, Indianapolis, Ind.



\$250 without effort

"With many so-called 'Radio Experts' in this city, I have cleared about \$250 in the past three months. This was in spare time, coming without solicitation on my part, satisfied customers recommending me to their friends. I would advise anyone who is anxious to get ahead in a field of clean pleasant work, with an unlimited future, to enroll with the N. R. I. at once."

EDWARD J. MEYER,
3833 Delmar Bl., St. Louis, Mo.



From \$10 to \$50 a week in spare time

"Besides being employed by the Power & Light Company to locate Radio interference in this district, which is a very good position, I have a service business of my own that nets me from \$10 to \$50 a week in spare time. I have about \$300 in testing equipment, all of which I built myself and it sure does the work. I owe all my success to the National Radio Institute, as I was only a common factory worker before taking the course."

H. L. PENIE,
812 W. High Street, Piqua, Ohio

You be the Boss

There are opportunities everywhere to have—

A Radio Business of your Own



Whom do you envy most? Isn't it the man who is his OWN BOSS—the man who owns and runs his business—who isn't tied down to a certain number of hours of work every day?

Of course it is! We all envy him. He has his fun when he wants it. He doesn't lose his pay when he takes an afternoon off to go to a baseball or football game, to play golf or go swimming, hunting or take an auto trip. He doesn't have to be in right on the dot every morning or be called on the carpet and perhaps get fired. He gets around. Meets more people. Is independent of the whims of a boss. He doesn't have to please anyone but himself.

There is practically no limit to the money he can make. He makes money on his own efforts and that of others working for him. Besides he always has that chance to put over a big deal and make as much money in an hour or two as the average salaried man makes in a month.

If that is your desire—this page and the one opposite will interest you particularly. I am going to tell you how you can have one—tell you of the almost unlimited opportunities there are to have a profitable Radio business.

There is a surprising need for good Radio stores almost everywhere. This is particularly true in the smaller towns and farming communities. Broadcasting programs, weather and stock and produce reports that are being sent out for the special benefit of men living on farms are developing new fields of opportunity.

The more you know about Radio principles—the more you know about sets—how and why they operate—the better qualified you will be to have a business of your own. N. R. I. covers these subjects thoroughly in its Course. It gives you the information you need to be able to judge which sets are best suited for use in your vicinity—what you need to know to supervise any service men who might work for you.

The man who knows his business thoroughly has the best chance to win out. My students and graduates have sent me letters of commendation which they receive from satisfied customers—set owners who promised to recommend them to their friends. That is what I want to do for you—fit you so thoroughly that you'll win wide recognition as an expert in your community.



Radio business prospers in spite of depression

"Thanks to the N. R. I., the depression has not had the effect on me that it has had on most others. My net profits in five months amounted to \$2,096. No amount of money would induce me to give up the knowledge I derived from my N. R. I. Course, if it were not possible to regain it. My shop is open to all who care to inspect it or who may wish to talk with me or write to me regarding the N. R. I. Radio Course."

L. LYMAN BROWN,
387 Belmont Ave., Springfield, Mass.

From \$25 a week to \$1,000 a year



"My profits have netted me better than \$3,000 for a year's work. I have a complete shop, containing the latest and most modern Radio equipment and service sets from the smallest to the largest. Before taking your course my pay was small, just \$25 a week, but after two months of your instruction I made enough extra money to pay for half my course. I have been greatly benefited both financially and educationally by your school and can personally endorse your method of teaching."

HENRY H. CREWS,
315 Pine St., Hot Springs, Ark.

Doesn't have to worry about salary cuts or lay-offs

"They say opportunity knocks but once in each man's life. Mine came when I wrote for 'Rich Rewards in Radio' and I wasted no time sending in my enrollment blank. The lessons were so interesting and easy to read and understand that you could not get them back at any price. Since my graduation I have built up a nice Radio sales and repair business and don't have to worry about getting my 'salary cut,' or being 'laid off.'"



LOUIS F. HUNTZINGER,
1406 Parsons Ave., Columbus, Ohio



Credits thousands of dollars in earnings to N. R. I.

"Enrolling for your course has meant real success for me. After the first few lessons were completed I began to pick up jobs in my spare time. Long before the course was completed, I accepted a position with a popular set manufacturer. Since that time, I have worked in the testing departments and laboratories of two other factories. For all this experience and the thousands of dollars I have earned, I give credit where credit belongs—to N. R. I. and its efficient training. I have found that a little ambition plus a little determination together with N. R. I.'s Radio Course eventually spells SUCCESS. At the present time I am in the service business for myself. There's no depression in my case for I have found that there are indeed "Rich Rewards in Radio."

KENNETH E. WHITE,
Box 112, Shiloh, Ohio



Annual sales and service reach \$15,000 mark

"In a few short years, we have built up one of the finest Radio services in this section of the country. Our annual sales and service have reached the \$15,000 mark, which nets a nice profit. We are 'cleaning up' our competitors—all North Jersey talks about the service we give, handling everything from transmitters to public address systems and electric sets. My brother Karl has not yet completed his Course with the N. R. I., but he has advanced so rapidly in knowledge that he is now in complete charge of the sales and service end of our business. Your excellent Course of instruction and personal service started us on the road to big money."

HARRY S. WAGNER,
Clinton Radio Service, Clinton, N. J.

Read what big money these fellows have made ★ in their own businesses

Had no profession. Now has own Radio business

"I started to make back my tuition before I completed your course and since that time I have devoted all my time to Radio servicing and repair. My business seems to increase every year and I am going to stick with Radio. Before I took your course I had no profession, but now I can say, 'I am a Radio-Trician'. It gives me a feeling of ease and reminds me of the good judgment I used when I enrolled with N. R. I. I shall be glad to write to any of your prospective students and tell them what N. R. I. training did for me."



R. S. LEWIS,
Box 514, Pittsfield, Ill.

Started with \$5

"I can't tell you the feeling of independence that N. R. I. has given me. I started in Radio with \$5, with which I purchased a few necessary tools. I circulated my business cards and soon had a very profitable business. After spending some time in Arizona, where I worked as a service man, I moved back to Wyoming and at once obtained a position with Montgomery Ward & Co. as Manager of the Radio Department. My work is very interesting and profitable and would not have been possible had it not been for the knowledge of Radio which I received from N. R. I."



HOWARD HOUSTON,
711 W. 10th St.,
Cheyenne, Wyo.

I'll show you how to start a spare time or full time business of your own on extra money made while learning

J. E. S.

Usually it requires thousands of dollars of capital to start and successfully operate a business. That is not true of N. R. I. trained men. Many of them start on spare time earnings—others on as little capital as \$50 or \$100, as you will see from the letters on this page.

Let's look over a few figures—size up your opportunities for a profitable business fairly and squarely. There are now approximately 13,000,000 receiving sets in use in the U. S. This figure is increasing daily. I believe the average set requires from \$3 to \$10 servicing every year. If only \$5 is spent—a gross volume of \$65,000,000 for servicing alone would be assured. Estimate the number of Radio sets in a 5 to 10 mile radius of where you live. Figure out for yourself how much you should make a year on service work alone. The amount will surprise you.

Millions will be made

Then consider this. It is expected that 5,000,000 or more Radio sets will be sold within the next few years. The dealer's average gross profit on a set is about 40 per cent of the sales price. The average sales price is about \$60.00, with accessories about \$75.00. Here again we want to be under rather than over the average, so we'll make it \$70.00. A profit of \$28 on each of the 5,000,000 sets means that \$140,000,000 will go into the pockets of the men in the Radio business within the next few years. Then think of the additional profit to be made on batteries,

tubes, condensers, loud speakers, remodeling sets, adding new features and other needs of set owners.

W. C. Howe, an authority on Radio Merchandising and the Radio Trade, says: "The Radio business can be handled satisfactorily only by men who are acquainted with Radio. A large percentage of the dealers lack this knowledge, and will drop out and be replaced by men who know".

Now is the time to start

Get into Radio now, while the time is right. You can start with little or no capital. I will show you how to make money during your spare time—raise the capital you need in that way. This will give you some mighty fine experience, too. It will build up customers for you—friends and others for whom you did work in spare time, will naturally want to turn to you to help them with their service problems and come to you when they want sets and parts.

I'll show you how others have done it and are doing it now. I will give you the same, yes still better training and attention, than I gave the men whose letters are in this book. My course today is better than when they enrolled. I honestly believe that the man or young man who wants a business of his own cannot find a better field than Radio. And by better field I mean one where it is easier to start a business that offers as many profit opportunities.



\$5,000 in the Radio business

"I am now in the Radio service business for myself, and am doing very well in spite of the so-called 'depression'. For over three years I was employed by the C. E. Beckman Co., as Radio Service Manager, which position was secured through my training from N. R. I. The National Radio Institute training has been of inestimable value to me and the Course, in my opinion, is worth far more than the price I paid for it. Even now, several years after finishing the course, the Graduate Department does everything possible to help me in every way. I have made over \$5,000 in the Radio business, almost all of which can be directly attributed to N. R. I. training."

JOHN CATTERALL,
155 David St., New Bedford, Mass.



Seldom under \$50 a week

"I have a fine business servicing Radio sets and am busy all the time. I am making a good living—seldom have a week under \$50. If it wasn't for good old N. R. I., I would probably be tramping the streets. If anyone wishes to beat 'old man depression', he should study your course and be sure of success."

GLENN C. KING,
815 Lafayette Ave., S. E.,
Grand Rapids, Mich.



Several times former pay

"I can sincerely say that I would not take any amount of money for the training in Radio which I received from you. I would recommend to any man who is at all interested in the subject, that he take your course. My service work has grown to a point where I simply had to build another service bench and shop in my home, where I can work at night. I am making several times the salary I did when I was city salesman for the Eastman Kodak Company and am, of course, my own boss. This is worth a great deal to one—after he gets along in life and does not care to have someone else telling him what to do."

EDGAR VAN GILDER,
P. O. Box No. 84, Highland Station,
Denver, Colo.

It takes trained experts to design, build, install and operate equipment like this

Experimenting and Inventing Offer You Many Rich Rewards



Rectifiers for English and Australian transmitters, Drummondville Beam Station, one of the powerful stations used for commercial communication with countries on the other side of the Atlantic



Power Apparatus Room, showing main control switchboard of the Drummondville Station



Above—Receiver, English and Australian circuits of the Yamachiche Beam Station. Below—Power Apparatus Room, showing incoming power control switchboard on right and main control switchboard on left, Drummondville Station



Miss Elizabeth Zandonini, an N. R. I. graduate, employed by the Bureau of Standards with some of her amateur equipment

To be successful as an experimenter, a research expert or an inventor, you must first have a complete and thorough knowledge of Radio. You must know it from one end to the other. Then you can draw ideas from other lines of Radio work that will help you in your problems. If you can cut out waste, improve results, develop some new way of doing things, your future and success are assured.

Perhaps the importance of this work is best shown by the salaries that are paid good men. They range as high as \$5,000 and \$10,000 a year. And as to the rewards for inventions, look over these figures. Dr. Lee deForest's patents, it is estimated, have earned in the neighborhood of \$500,000,000.

H. P. Donle sold his Sodian patent alone for \$300,000. Latour has made \$1,500,000 on his Radio inventions. Hazeitine is reported to have made more than \$2,000,000 on his patent. Dr. Fessenden's patent on the heterodyne principles brought \$1,000,000. There is a chance for a big fortune in this work.

My practical course is a very fine foundation for the man who feels the urge to develop—to create. It has often been said that the most interesting work is creative work—it is interesting, satisfying and profitable. I shall be glad to give you information pertaining to the proper procedure to be followed in getting a patent. While taking your Course many ideas may occur to you that offer possibilities.

I believe the Radio field offers more possibilities than any other for successful and profitable inventions. No where else is there such an infinite amount of development and expansion possible. No other field, in my opinion, has the great future, the unlimited possibilities of Radio. Many small devices can, and have made great fortunes. Dubilier's fixed condenser, a little contrivance of pasteboard and ink, has made millions.

It doesn't take a genius to invent. Nothing could be farther from the truth. Edison himself said that success in this work is nine-tenths perspiration and one-tenth inspiration. Quite a number of N. R. I. graduates have been granted patents on Radio inventions and it wouldn't surprise me to see one of them become famous and rich on an idea. Who knows—it may be you.

**Has made \$10,000
more in Radio**

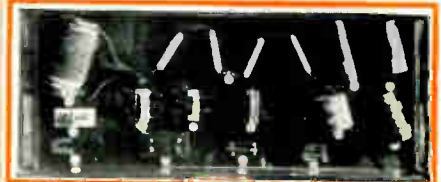
St. Cloud Ave.,
West Orange, N. J.



Dear Mr. Smith:

I am not exaggerating when I say that I didn't know a volt from an ampere at the time I subscribed to your course. My first position was with the Garod Corporation. During my four and one-half years with them I worked successively as bench hand, foreman, superintendent and engineer. Since then I have been employed in engineering work only, first with the Ward Leonard Electric Company then with the Conner Crouse Corp., and at present with Hardwick Hindle, Inc. I can safely say that I have made \$10,000 more in Radio than I would have made if I had continued at the old job. Wishing you continued success in your educational work, I am

Very sincerely yours,
VICTOR L. OSGOOD



Historical Marconi apparatus used in his first experiments. Radio grew from these crude "jiggers". Below you see Marconi, father of Radio, with some of his equipment



You'll find Thrills and Good Pay in Aviation When you know Radio



The guiding hand of the aviator in the clouds is the Radio man — on the ground.

Radio is taking the uncertainty out of flying. Its value on long flights over unmarked territory has been very definitely proven by the success of the flight of the Southern Cross from California to Australia; Admiral Byrd's expeditions to the North and the South Poles and on many other occasions. Airports are being established all over the world. Many planes are being Radio equipped. Airplane passenger service seems to be increasing regularly. Air Mail service has been established for a long time.

airways throughout the country are now principally of two classes: The Radio range beacons and the Radio weather communication stations. The intermediate frequency Radio range stations, as you probably know, send out directional signals along the airways to guide aircraft, while the Radio weather communication stations disseminate weather information by Radiotelephone to aircraft in flight.

On February 1, 1932 there were 724 Airports and landing fields in the United States having night lighting equipment. There were 69 Airway Weather Broadcast Stations. Over five hundred thousand passengers were carried in 1931. Over 47,000,000 miles were flown during the same year over American operated and scheduled air lines.

Frederick R. Neeley, Chief of the Aeronautic Information Division of the Department of Commerce wrote us in part on May 2, 1932; "The Radio aids to air navigation along the various

"The operators of these stations are employed through the Civil Service Commission and receive salaries ranging from \$1620 to \$2900."

Do you want thrills, adventure, good pay? Here is your opportunity to get all three in one job. Picture yourself making long flights that may bring fame or fortune. Or making hops from city to city in passenger planes. Or working in an airport, directing planes and sending weather information. Here is a field where you can find work so interesting as to satisfy you for life. N. R. I. offers you special training in Aircraft Radio—traiaing for the jobs on land (in airports) and on planes. This training is thorough—not composed of a few cheaply mimeographed or multigraphed sheets, stapled together. The books are of N. R. I. standard Lesson Text size, printed in easy-to-read type, on paper that is easy on your eyes under a study lamp.



Radio equipped airport for telephoning to airplanes in flight.

Operator in charge Airways Radio Station

Airways Radio Station, Dept. of Commerce, Bellefonte, Pa.



Dear Mr. Smith:

N. R. I. will always hold a warm spot in my heart, because it started me on the right path to success. Since completing your course my activities in the Radio field have been rather varied, including Radio operating in the Navy, for commercial steamship lines and at the R. C. A. Chicago Coastal Station. At present I am operator in charge of the Airways Radio Station here at Bellefonte, Pa., and have four men under me. My salary is \$2400 per annum.

The work here is very interesting, as all work dealing with Radio and aeronautics must be. Our duties consist mainly of keeping the mail pilots advised of weather conditions along the route by means of scheduled weather collections and broadcast of same, and keeping the Radio range transmitters, both visual and aural, operating. We have the best of apparatus to work with, and since it is both expensive and complicated, the operating personnel must consist of thoroughly trained Radio Experts. I feel that I owe N. R. I. a great debt for the wonderful start it gave me on the road to success.

Sincerely,
L. T. NEWELL



Nerve center for Uncle Sam's National System of Civil Airways. Weather reports and other information are transmitted to aviators



The arrow in this photograph points out a Radio beacon installation on the instrument board of an airplane



Operator with Radio equipment on Byrd's plane, "America", with which he crossed the Atlantic.



TELEVISION

-the great new Radio development

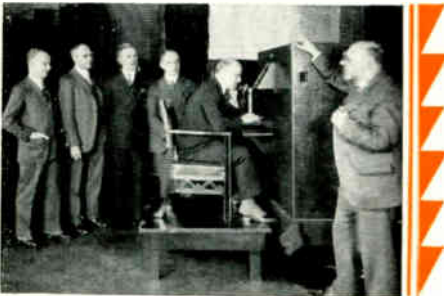
My Course prepares you to enter this coming field of amazing opportunities



My friend, C. Francis Jenkins, Inventor of a system of Television had me come over to his laboratory to explain his apparatus to me.



Face and voice being sent over wires to New York. An audience in New York saw as well as heard Hon. Herbert Hoover on this occasion.



President Gifford of the American Telephone and Telegraph Co. in New York talking with Mr. Hoover in Washington during a Television test.



Courtesy *Wide World Photos*

U. A. Sanabria, young Television expert, standing beside his equipment that amplifies light two million times.

It doesn't take a very long stretch of the imagination to realize what is ahead when Television is perfected. Think what it will mean when home receiving sets are equipped so that we can see as well as hear the artists, see our baseball, polo and football games as well as hear the announcers, witness a prize fight blow for blow.

It will mean that the entire Radio industry will be made over again. The millions of receiving sets now in use will be replaced with a new type equipped with Television attachments.

Many of the best engineering minds in the country are working to perfect it. It has almost arrived. It is here to the extent that approximately 20 broadcasting stations are transmitting pictures for experimental purposes. We are promised not only still pictures but moving pictures as well right in your home just as though you were on the spot.

So you see the limit of Radio expansion is as far off as ever. Radio is not standing still. Probably no other industry is being developed so fast, being adapted to so many new uses.

I don't want you to think of this as news. Look behind the scenes. What do you see? Innumerable fine jobs in the making—you see opportunities like those that made men rich in other fields who got in at the right time. Actually you see the opportunity of a lifetime. Chances like this do not come every year or every few years—usually only once in a generation.

Every man of character, of ambition, every good citizen, wants to make enough money not only to have a reasonable number of today's living comforts and enough to enjoy himself thoroughly and at the same time be free from money worries, but enough more to put aside a little nest egg to take care of himself when he reaches the age when he will have to let down. To do this you must get in a field where you don't have to spend 5 to 10 years getting a foothold—and a field where you can forge ahead right from the first month you enter. Today that field is Radio. This new branch adds still more jobs to Radio's many attractive opportunities.

As high as \$600 a month

901 Quail Ave.,
Bellevue, Pa.

Dear Mr. Smith:

The day I requested a copy of your book, "Rich Rewards in Radio" was the real turning point in my whole experience. Since I found in Radio my life's work, I have been handsomely rewarded in a financial way. While training with N. R. I., I earned on an average of \$125 per month, and this in spare time only. Today I have a service contract with one of the largest electrical appliance organizations in Western Pennsylvania, which enables me to make very good money. My income from service alone runs as high as \$600 per month. Without N. R. I. training this could not be possible, and I do not hesitate to place the credit where it belongs, with the National Radio Institute. Best wishes to the N. R. I. staff.

Sincerely,

HENRY C. HAYES





Al Jolson, in the lower right hand corner, is seen here making "The Singing Fool".

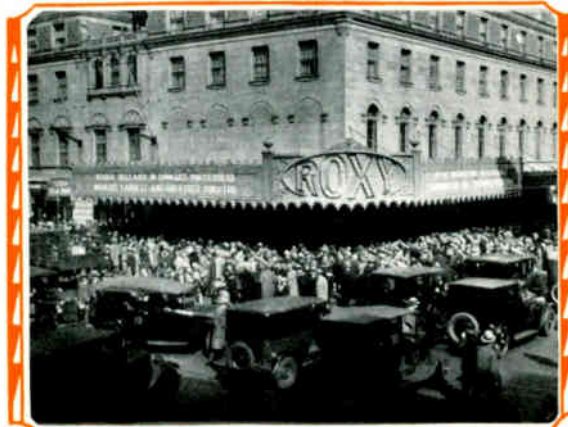


The Vitaphone apparatus used in the recording room is a marvel of delicacy and accuracy.

TALKING PICTURES

My Course gives you the Radio principles that make talkies possible

There are approximately 25,000 theatres equipped for Talking Pictures. The need for trained Radio men by film companies was so great when this invention was first brought out that many broadcasting station operators were offered jobs at salaries of \$75 to \$125 a week to enter this field. This is one illustration of the opportunities a trained man in Radio has to get ahead once he gets in. New developments bring new openings requiring trained experienced men and those who make good are usually offered early opportunities for promotion or chances for better connections.



Outside view of Roxy's Theatre, New York City, one of the largest moving picture play houses in the world. Talking pictures are shown here regularly.

With the invention of Talking Pictures, Radio has invaded another new field. It is not generally known that Radio principles are applied and used in connection with the taking and showing of Talking Pictures. There are several systems in use. One is that of recording the voice or music on a phonograph disc and synchronizing the production with the picture. The other consists of recording the sound waves of music, voices and noises on the film, beside the picture. My course covers both principles.

Public Address Systems another field for the Radio Expert

By training you to install and operate Public Address Systems I may be getting away from what might be strictly called the Radio field, but I feel that by doing it, I am opening another way for my men to make money. Radio principles are used in this equipment. The old plan of a speaker yelling himself hoarse to be heard, is being replaced by this new method. The man who knows how to install and operate Public Address Systems can quite often pick up extra money. I know of one fellow who made \$25

in one evening in this work. Churches, railroad stations, auditoriums, political gatherings, and many other occasions and places find use for this invention. The making of this equipment has also reached considerable proportions, opening quite a number of fine jobs with the manufacturers. Likewise, distributing them calls for salesmen, repairmen. No doubt you will often have a chance to pick up some fine money using the knowledge of this subject that I shall give to you.



Public Address field promising

"The N. R. I. Course has increased my earning capacity 500% since the time I finished it. We are firmly established in this territory as the outstanding Radio dealers, having obtained an exclusive agency on Samson-Wright-DeCoster Public Address Systems and Ellis Microphones. We look forward to a very good business with them—in fact, from all indications, we are going to have more than we can do. The Public Address field certainly looks promising. There is a real lack of trained men in the Radio industry and any man who wants to advance, cannot go wrong in this field."

FRED A. NICHOLS,
627 8th Ave., Greeley, Colo.



POLICE RADIO-AUTOMOBILE RADIO ELECTRONICS - *are growing fields of* OPPORTUNITY



Courtesy Universal Pictures
Radio has proved its worth for Police work. Our larger cities are adopting it, creating fine jobs for well trained Radio men.



Auto owners need not miss Radio programs because they are out driving. Great expansion is ahead for the manufacture, sale, installation and repair of auto sets.



This photo shows a broadcast program being picked up from a crack B. & O. train. Short waves have opened many new opportunities for Radio trained men.



Buses use Radio to entertain passengers. Hundreds of buses are not Radio equipped. Splendid opportunities await you in this new field.



Courtesy Electronics
The white circles show photocell installations used for controlling traffic at street intersections. The use of Photocells represents one of the newest Radio developments. They are finding wide use in many different industries and for many different purposes.

These new fields—the use of Radio in connection with Police work, the installation of receiving sets in pleasure automobiles, and Electronics, give you a good idea of how fast Radio is growing—how many new activities and fields it is invading. A few years ago the only use of Radio was in sending dot and dash messages. Look what has happened since. Broadcasting stations have sprung up all over the world. The application of Radio principles made possible Talking Movies, Public Address Systems. Millions of sets are in our homes. It is now possible to pick up your telephone and talk by means of Radio to friends who are on ships at sea or across the ocean.

The use of short wave Radio in connection with Police work is one of the newer applications. One of our graduates, Mr. Norman R. Hood, had charge of installing the Police Radio System in Akron, Ohio. Many Radio men have obtained excellent jobs in connection with this activity. The installation of the apparatus is not the only job. Police cars must be equipped and the equipment must be kept in order, broadcasting equipment must be made, installed and kept in working order day and night.

Automobile owners need no longer miss their favorite Radio programs because they are out on a trip. Automobile sets have been installed by taxicab companies, bus companies and individual auto owners. But, this market has hardly been scratched. It is estimated that less than one million automobiles, out of a total of about twenty-five million, are equipped with Radio sets. Think of the opportunities—making the sets, installing, repairing them.

Short wave transmitting and receiving sets are taken up in our course. Therefore, as an N. R. I. student you will learn how to install, operate and repair such systems as are used for Police work. Automobile sets are covered thoroughly also.

Electronics is one of the newer branches of Radio, and perhaps one of the most fascinating. The comparatively simple little electronic tube does some very amazing things. With its use traffic passing street intersections can be counted. Traffic lights can be turned off or on at regular intervals. Sorting, grading and counting work of many different kinds has been found feasible, fast and accurate by means of the electronic tube. It automatically opens and closes doors, sets off burglar alarms, controls city lighting systems.

Electronics is a new science. It is still young—but offers amazing possibilities for future growth. It can be used profitably in many different industries, many different activities. Let me give you one or two examples. Cigar manufacturers find that an electronic device can be used for sorting various grades of tobacco. Steel wire factories can control the uniform size of wire and regulate the winding and measuring of it. Similar devices are feasible and useful in the manufacture of paper, paint, automobiles, steel, sugar, pottery, furniture, etc.

The principles of electronics are covered in the N. R. I. course, opening the opportunities to you that this field has made and the many more which it will make. Many engineers believe that soon electronic devices will be in use for thousands of different purposes and in thousands of different businesses.

Here are other opportunities Radio offers you

The Radio field has become so large, its uses so many, that I cannot give a lot of space to all of its opportunities. Let me list a few more for you.

Caring for and operating Radio compasses and directional finders used on board ship and Radio compass stations along our coast. Radio journalism—writing or editing the Radio sections of newspapers and magazines. Hundreds have Radio sections.

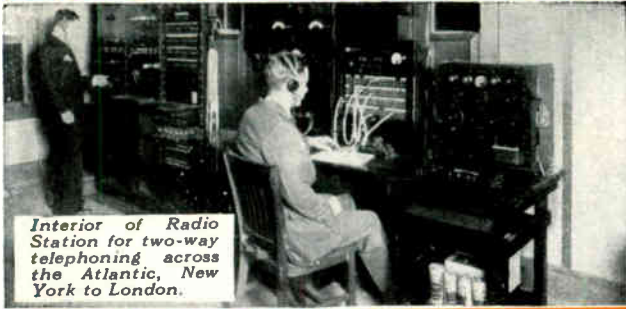
Oil companies, rubber companies, mining companies, film companies use Radio for com-

munication between branch offices long distances apart.

Schools and colleges use Radio to broadcast educational information, and Public Address Systems for simultaneously addressing pupils in different class rooms from one central point.

Radio is used on dirigibles, submarines and by the Army and Navy extensively. Uncle Sam spends millions on Radio.

A Radio knife has been invented for use in surgery. Radio has been found useful in the treating of certain diseases.



Interior of Radio Station for two-way telephoning across the Atlantic, New York to London.



Transmitter at Radio Central, Long Island, N. Y., powerful land station.

Growth of Commercial Land Stations *has* made many fascinating jobs *for* Radio Men

Not so many years ago the only connection, the only touch which one country had with another separated from it by water was by means of cable. When cables broke, the countries were cut off completely. Today, Radio makes it possible to send a Radiogram easily from one country to another—just as easily as you would send cablegrams in former times. The Radio operator in a commercial land station is a very important link between countries separated by water.

Radio, to a considerable extent, is supplanting the cable and to some extent the telegraph also. Plans have been announced from time to time for the inauguration of commercial Radio service between cities—that is, the sending and receiving of Radiograms just as telegrams are now. This development, in my opinion, is due to come, and with it bring many opportunities for licensed Radio operators, for engineers and Radio mechanics. Commercial Radio communication is not limited to public use. Many large firms with branches in different parts of the country and different parts of the world use Radio for inter-office communication.

A short time ago a notable forward step was made in inter-continental communication. Trans-Atlantic telephony was opened to the public. Since this branch is closely allied with commercial land stations, I'll tell you about it here. Now it is possible to pick up a telephone, be connected with a Trans-Atlantic Telephone Station and in a few minutes be talking to your friends across the water. Radio communication in code between countries separated by water is also carried on extensively. Our coast lines are dotted with transmitting and receiving stations. Only trained men who are competent can be trusted with the expensive equipment required to carry on commercial telephone and telegraph communication. There is too much money involved—too much money invested in this equipment to trust the jobs to anyone else.

This is one more instance of Radio's amazing growth—a growth that made fine jobs for Radio Experts. You're looking for opportunity—here it is—waiting for you to step up and claim your place. And the work is fascinating, your future bright in this field.



Short-wave receiver at Netcong for commercial Radio communication.



Speech input control panels, Deal Beach Station, for trans-Atlantic Radio Telephony.

Paid for \$3000 laboratory and station with Radio earnings

171 N. Summer St.,
Adams, Mass.

Dear Mr. Smith:

I want to tell you what N. R. I. has done for me. I have just completed a \$3000 Radio station that I paid for from the proceeds received doing Radio work. I have built a laboratory which is situated on a hill 200 feet high. I have a Short Wave business which brings me a great deal of money. I receive from \$1.50 to \$2.00 an hour on receivers and \$3.00 an hour on trans-



mitters. I am now handling the entire service work of three Radio dealers in town. I wish to extend my greatest appreciation to the N. R. I. Staff for what their course has done for me.

Sincerely yours,

HARRY O. BARSCHDORF

Since writing this letter our Employment Department has placed Barschdorf with the Westinghouse Electric & Manufacturing Co., where he is testing Photophone and Movie-tone apparatus, also airplane transmitters.



Courtesy General Electric News Bureau
General view of W2XAF—experimental relay short wave broadcasting station operated by the General Electric Company.

You can travel all over the world *without* expense as a **Radio Operator** on board ship



Famous Eiffel Tower in Paris

Do you long to travel? If you do, you can visit France, England, Italy, Germany—travel all over the world without expense and make good money besides. Where would you like to go? Do you want to head straight across the Atlantic to Europe? Do you want to visit Cuba, Porto Rico, Brazil or other South American countries? Do you long to see Hawaii, the Philippines, Japan, China, Australia, New Zealand?

Over 2,000 American vessels are equipped with Radio apparatus, according to a recent report from the Department of Commerce. They touch practically every port, every continent, every country and every nation. Some are engaged in passenger traffic only, others carry passengers and freight, still others, freight only.

Yachting provides another branch of opportunity for Radio operators. Ocean going yachts, pleasure vehicles of the rich, are equipped with transmitting and receiving apparatus. Coast line traffic enables the operator to visit Portland, Boston, New York, Miami, New Orleans, on the East Coast and on the West Coast, Alaska, British Columbia, Oregon, Washington, California, Chile and many other interesting places.



Visited many foreign countries

"Through the N. R. I. Employment Service I obtained my first position as operator of Station WHAD, Milwaukee, Wisc. After a year or more at WHAD, I became Chief Operator at WTMJ, the Milwaukee Journal Station. Later I came back to my home state, Nebraska, and secured a job with KMMJ at Clay Center, later becoming Chief Operator there. I left KMMJ to enter the Ship Radio branch of operating and during two years of service with the Radiomarine Corporation, I had the opportunity of visiting the following countries: Canada, Germany, Belgium, Netherlands, Porto Rico, Haiti, Dominican Republic, Cuba, Colombia, and Panama."

PAUL C. ROHWER,
2041 K St., Lincoln, Nebraska



E. N. Pickerell, at the time he was Radio Operator in charge on board the S. S. Leviathan

Large passenger ships as shown on the bottom of this page sometimes carry as high as six operators. Passenger ships of smaller size usually carry from one to three, freight ships from one to two, depending upon the cargo and amount of traffic to be handled. It is not unusual for an operator on his first year out to cover 25,000 miles, some even make trips around the world. No matter what type of ship you get on, the best there is is yours, the same consideration, accommodations and general treatment as are furnished to the licensed officers of the ship. You are provided with an officer's stateroom and all of an officer's privileges. While your ship is in port you are usually free to do as you like. There's no room and board to pay for. For that reason as a ship operator you will find it easy to save money as practically none of your expenses need be paid from your salary.



Canal Scene in Old Venice



Here you see a Radio operator enjoying shore leave. Many enjoy thrills, adventure, good pay in this fascinating branch of Radio.

Travelled 75,000 to 100,000 miles

Station KSAC,
Kansas State College,
Manhattan, Kans.

Dear Mr. Smith:

I took my commercial examination under the Inspector of the 9th District. I do not wish to say this as a boast, but of the men who took the examination, only two, myself and another fellow, passed. I have worked as a relief operator at KMMJ, on board the S. S. Dorchester as Junior Operator, and Chief Operator of the Chester Sun.

It is hard for me to say just what Radio has meant to me, my health and my happiness. I have traveled from 75,000 to 100,000 miles by water, have visited ports in various countries, fished and motored with millionaires in Florida, been on airplane flights, played in the surf and in the pools, played tennis, golf, boxed—really it has been one grand and glorious vacation. I am now with Broadcasting Station KSAC. I came here because it has always been my ambition to go through college. I decided that Radio would give me easy, fascinating work—besides the chance to make money. Again let me thank you for the splendid cooperation given me ever since I first enrolled.

Sincerely yours,
ROBIN D. COMPTON

Travel, earn a good salary, enjoy life

Radio Operators' salaries range up to \$125 a month, and more in special cases. And remember, this salary is practically free from expense. The lowest paid operator, can, without stinting himself, save hundreds of dollars a year and see the world besides, see places that others pay good money to see.

Since a commercial license is required to be an operator on board ship, if this branch of Radio appeals to you, I suggest that you enroll for my Certified Radio-Trician's Course with code included. Page 57 tells you about my Special Code Course for men who want to be Radio operators. All ships use the dot and dash system of sending and receiving messages although a few have been equipped with Radio Telephony so that passengers can talk to friends ashore even while in mid-ocean.



S. S. Leviathan. Large passenger ships travel, the chance to meet prominent and board ship truly romance

Taste Romance and Adventure in many foreign lands. I will fit you for the fascinating life of a Radio Operator.

The show places of the earth—countries, cities, ports—rich in scenery, famous in history are open to you. Spend a few years or the rest of your life roving the earth's high-ways and by-ways. See for yourself Egypt's pyramids, centuries old, one of the seven wonders of the world, the squalor of China's ancient cities, Buenos Aires, "The Paris of the Americas". Talk from experience of the old ports once pirate strongholds, now draped in traditions; of Constantinople and its great Mosques decorated with cloths of gold and millions of dollars worth of gems; of Monte Carlo, the smallest principality in Europe famous as a great pleasure resort. Walk through the streets of Athens, so prominent in Ancient and Medieval History on up to the Acropolis, now in ruins.

In Asia you may stop off at Jaffa, referred to in the Bible as Joppa, the port of Jerusalem. In Australia and New Zealand meet some of the boys who fought beside you, or your brothers or friends in France.

In France you will see the tomb of Napoleon, the Cathedral of Notre Dame, the Louvre with its world-famous art treasures; in Italy the Coliseum dating back before Christ; in Germany a trip on the Rhine or Blue Danube will reveal marvelous castles. In England visit Westminster Abbey, the Tower of London, the House of Parliament; in Belgium the battleground of Waterloo marking the beginning of the downfall of Napoleon. Everywhere you will

see buildings erected hundreds of years before North America was discovered—famous in history, identified with the lives of Kings and Queens long dead.

To travel is to be liberally educated—to enjoy life. Men and women with money enough to do most anything they choose, spend their playtime visiting places described here. The millions of dollars spent every year by America's rich, to see, to experience the things that you as Radio operator can enjoy without any expense, help to maintain passenger ships; some of the countries of Europe exist almost entirely on tourists' money. Here is interesting, pleasant, fascinating work that is truly romance—Radio operating on board ship. And the door to this great opportunity is wide open to you through N. R. I. training. Many men and young men have entered Radio operating as a result of their training with me. Get your start now through N. R. I. Enjoy life—make more money.



Radio operator of the S. S. Avalon, calling a business firm in St. Louis by wireless telephone while the ship is in Mid-Pacific.



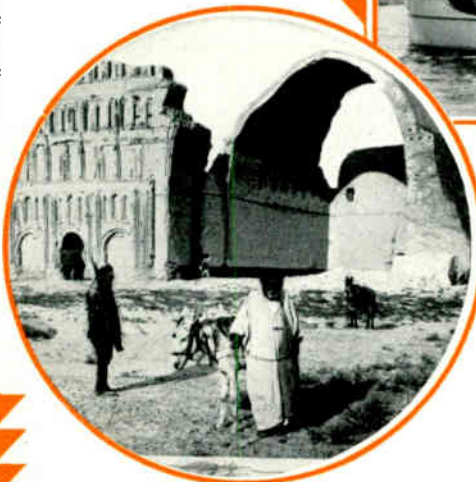
The House of Parliament building, London, England.



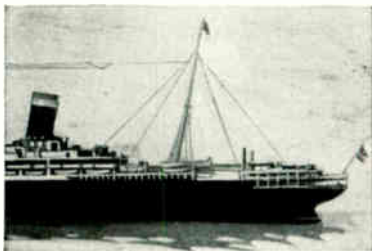
Temple of Heaven, Peking, China, built in 1420. The Chinese believe it covers the exact center of the earth.



Many luxurious yachts provide fascinating employment for Radio operators.



Babylonian ruins which stand on the eastern banks of the River Tigris. These are just a few of hundreds of interesting and famous sights many Radio operators enjoy.



carry as high as six operators. Good pay, influential people make operating on

Visited all parts of the world. Now Radio Engineer of Station WJBY

Radio Station WJBY
Gadsden, Ala.

Dear Mr. Smith:
Since obtaining my commercial Radio operator's license, I have been engaged in operating and engineering at various broadcasting stations and with the Radiomarine. I have visited all parts of the world and have had many different experiences on my trips to foreign lands. For two years, I was connected with Station WFDW as Engineer, where I designed and built a station modern in every particular. At the present time I am engineer of Station WJBY. I like my new job fine and got a 25% increase in salary. Your Radio Course has enabled me to constantly increase my earnings since entering Radio, a profession that is both profitable and interesting. I think your course is the best ever offered.

Sincerely yours,
J. C. VESSELS



These Famous Radio Men are members of my advisory board



Dr. Lee deForest

Graduate of Yale, perfected the Electrolytic receiver in 1902, invented the three element vacuum tube which has not only made the rapid growth of Radio possible but has extended telephonic communication, also inventor of the Phonofilm system of talking movies. He has received many honorary college degrees.



Gen. Geo. O. Squier

Graduate of the U. S. Military Academy. He served in many capacities in the U. S. Army, including that of Chief Signal Officer, Headquarter Department, California. He was U. S. Military Attache, London, England, 1912 to 1916. Has been awarded many medals for scientific accomplishments. Patentee of Wire Radio.

You get the benefit of their advice to me, backed by their great knowledge and experience

You will, no doubt, be glad to see that the National Radio Institute has men on its Advisory Board of nation-wide and world-wide fame. Every one of these men has made an enviable name for himself. Naturally, men of such standing, ability and prominence, as these, are careful of any connections they make. Therefore, I am grateful to them for having consented to serve, because in a way, it indicates that N. R. I. stands high in their opinion as an educational institution and as a necessary and vital organization to Radio's welfare and growth.

Since it is now, as it has always been in the past, my aim to give a training that represents the best thought and talent in Radio, I organized this Board to enable me to secure expert, authoritative advice on instruction information to put into my course. I consult these prominent men regularly for that purpose.

I want you to notice the wide range of experience these men represent.

Dr. Lee deForest is Radio's foremost inventor. He gave Radio the vacuum tube, the outstanding invention that has made Radio the big field that it is today. He has been showered with many honors because of his great work.

General George O. Squier is a recognized authority on Radio in Army circles and is the inventor of Wire Radio.

Paul A. Green, formerly Chief Engineer, Columbia Broadcasting Company. His opinion and advice on information pertaining to broadcasting stations should be very valuable to me and my students.

George Lewis, because of his long association with Radio manufacturing, can help me and you, too, by his advice on instruction material covering this branch.

C. M. Jansky, Jr., has taught Radio for many years. His experience and study should be valuable. He has written a number of the Lesson Texts now in my course.

Edgar H. Felix, well known author of books and magazine articles on Radio, has also written some Lesson Texts for me.

By drawing on the experience and advice of these men, by securing the best work of experienced and recognized writers on Radio subjects, and by using the services of my own Staff also to prepare Instruction Material, I believe you will agree with me that I have many advantages to offer over a "one man" course—that I have the training you need to succeed in this field.



George Lewis

Was for many years with the Navy in charge of Radio design at the Bureau of Engineering, in 1922 joined Crosley as assistant to the President. He has at various times been Manager of the Institute of Radio Engineers; is Chairman of the Vacuum Tube Committee of the Radio Manufacturers Association.



Paul A. Green

One of the two men to first install a telephone in a lighter than air machine. After the war, went with Western Electric Company—installed 11 of the most powerful stations in U. S. Installed WSAI and managed it for four and a half years. Then went with the Columbia Broadcasting System as Chief Engineer. Now, Consulting Engineer.



C. M. Jansky, Jr.

From 1920 to July, 1929, had charge of instruction in Radio Engineering at the University of Minnesota, also of the University's broadcasting and experimental station. Now practicing as a Consulting Radio Engineer. A Member of the Board of Directors, Institute of Radio Engineers and American Radio Relay League.



Edgar H. Felix

Broadcasting consultant and authority on Radio allocation. Served as Radio Engineer in the Signal Corps. Now Radio Consultant to the Nat'l Electrical Mfgs. Association, contributing Editor to Radio Broadcast, Aero Digest and writes for Radio Retailing, Advertising and Selling. Author of "Using Radio in Sales Promotion".

Radio Recognizes *1 1 1* *your superior knowledge and training* when you become a Certified Radio-Trician

After having spent about 17 years of hard work and thousands upon thousands of dollars building our organization and training to their present position of leadership, it is only natural that we should want to designate graduates of our course by a name that distinguishes them from any other in the Radio field. We want them to benefit from the recognition accorded the high quality of our training, so we have adopted the title "Radio-Trician".

No one else except an N. R. I. graduate has a legal or moral right to call himself a "Radio-Trician". The word has been registered by us. You get a diploma as "Certified Radio-Trician" designating which of my Five Advanced Courses you have taken, such as "Certified Radio-Trician, specializing in Broadcasting, Commercial and Ship Radio Stations."

That these words have come to mean much in trained, specialized knowledge and ability is proved by the fact that many men in Radio, and firms too, are trying to use it apparently with a view to "cashing-in" on what it stands for.

Realize what it means to you to have the right to use one of these titles on your letterheads, billheads, envelopes, cards and in your advertisements. It means that you have passed the requirements

of the Pioneer and World's Largest Home Study Training Organization devoted only to Radio training. It means the recognition accorded this Institute as the leader in Radio training among the Radio trade is behind you and your efforts for success.

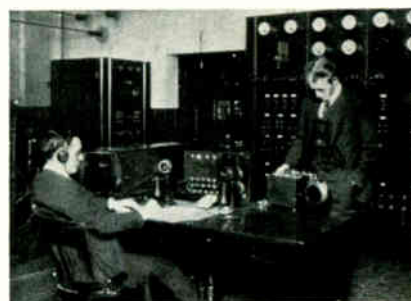
Such recognition cannot be acquired over night or even in a few years. It has to be earned by steadfastly maintaining a quality of training over many years so as to win the respect of those who are high up in Radio and are, therefore, able to judge accurately its completeness and thoroughness.

We have not been idle in the work of establishing the superiority of our training in the minds of Radio's leaders. Thousands of dollars have been spent in advertising and promotional efforts, acquainting the public and employers with our course and what it includes. Complete courses have been sent to many persons and firms with the result that many letters expressing surprise at the great wealth of practical information it includes have been received here.

So when you graduate from N. R. I. you are a recognized Radio Expert, because of your title and what it has come to stand for.



Behind the scenes in a Broadcasting Station. Jobs like these can only be trusted to men of recognized training and ability.



Radio Experts on duty at WGY enjoying pleasant surroundings, fascinating work with great future possibilities.



During the 15th Anniversary Convention of N. R. I. graduates held in Washington in 1929, Vice-President Curtis in a brief address delivered to them in front of the Senate Office Building said, "There is no greater opportunity in America today than Radio for men and young men seeking a profession."

You get these **18** unequaled star features of my course

On this and the following pages I explain the Eighteen Outstanding Star Features of N. R. I. training and service. Be sure to read every word about them, for they are highly important to you. Then you will realize why my graduates write me such enthusiastic letters, why they go so far in Radio, how carefully and thoroughly



N. R. I. training has been prepared. And remember that the training, material, privileges and services which your enrollment will bring you have been under development for 17 years. We believe we have reached a point in perfecting them that no one else can match.



My Money back agreement protects You!

Your advertising does not misrepresent



"My Radio work consists mostly of selling and servicing sets and my average income per year from Radio as a side line amounts to about \$500 to \$1,000. Your Course has been invaluable to me—I could not do this without your training. I have found that your advertising does not misrepresent what you do for each and every student."

HANS J. MUELLER,
316 King Street, Hillsboro, Ill.

Within a few hours after your enrollment is received, a Money-Back Agreement identical with the one reproduced here, will be made out in your name and forwarded to you. This agreement is legal and binding upon the Institute. Its terms are clear and broad. It is my way of showing you that all of us here at the Institute are going to do our very best to satisfy you. And if we fail, every penny you pay us in tuition will be refunded.

You can start your training with absolute confidence that you are going to get your money's worth or money back, because you aren't taking any risks—you can't lose a penny. When you finish, you alone will decide whether or not we

have given you a satisfactory Course and whether our Instruction Service was rendered to suit you.

If you want to know more about our responsibility than I give you in this book, have your banker look us up in Bradstreet's, or write to the Federal-American National Bank and Trust Co., or the U. S. Savings Bank, both of Washington, D. C. Or, write to the publisher of any large Radio magazine in the country.

I don't believe I could prove to you in a better way the confidence I have in my training and in my men who will help me train you. All our resources stand behind this Iron Clad assurance of your satisfaction.

Received more for his money from N. R. I.

"After completing the N. R. I. Course, I was in charge of the Radio Department of a chain store and out of my earnings, paid my expenses through Purdue University. I then came to Richmond and started in business for myself and have been very successful. I have sold over 80 Atwater-Kent Radios and have had all the service work I could take care of. I now own the most complete service equipment in this part of the state, some of which is of my own design. I have secured as much good from your Course as from any I have studied in the University. The clear and concise manner in which it is written is one of your outstanding accomplishments. I would not hesitate to advise anyone who intends to enter the field of Radio, either for spare time or full time work, to take your Course. I have received more returns from the money I put in the N. R. I. Course than from any other I spent for education."



BROUSE D. RINEHART,
432 Main St., Richmond, Indiana

MONEY BACK AGREEMENT
An Iron-Clad Assurance of Your Satisfaction

This certifies that

has been enrolled as a student of the National Radio Institute, and as such is entitled to the complete course of training, including all benefits and privileges pertaining thereto.

This further certifies that if after completing the course and paying in full he is not entirely satisfied with the Lessons and Instruction Service he has received, then upon returning all apparatus and material furnished to him and making written request, stating clearly his reason for dissatisfaction, within 30 days after he has finished the course, the Institute will refund every cent paid for tuition.

NATIONAL RADIO INSTITUTE, Inc.
16th and U Streets Northwest
Washington, D. C.

J. Schmidt
President.

A copy of this agreement, made out in your name, will be sent to you as soon as you enroll.

My 5 Advanced Courses

enable you to *Specialize*
in the Branch of Radio
that suits you best ★ ★

2nd
STAR
FEATURE

Again N. R. I. is pioneering. The Pioneer Home Study Radio School is now pioneering in specialized advanced training to cover the five active growing fields of Radio opportunity. Radio has become such a large field that one

single Course can no longer cover Radio principles and their application to these 5 branches except in a very limited way. I want my men to be able to go further, make more money than the average fellow who enters this field.

Specialization is the key to bigger success

This is a day of specialists. The doctor who specializes on some one part of the human body, or the lawyer who specializes in one branch of law is usually more successful than the general practitioner. These Courses give you the fine points about these 5 branches—things that are seldom covered in a general Radio Course. It is not my object merely to train you so that you

can get some kind of a job in Radio—just so you can get a start. I want to train you thoroughly so that you will not only be equipped for a good job when you graduate, but also have a foundation upon which to build a real future. I want to see you up among some of the leaders in a few years. If you aim high with me, I believe the two of us can put you there.

You get any one of these Advanced Courses without extra charge

If you are interested in doing service work, naturally you don't want to spend your time studying details about Broadcasting, Commercial and Ship Radio Stations. If you are interested in Sound Pictures and Public Address Systems you would not want to spend several months on the practical side of Aviation Radio. This method not only enables you to specialize; you also save the time you would waste on a general course which tries to cover all of these branches. However, in my Certified Radio-Trician's Course you learn the essentials of these growing fields.

I start you on the Advanced Course of your choice as soon as you finish my Certified Radio-Trician's Course. Incidentally you need not decide when you enroll which one of these Advanced Courses you want. You can wait until you have finished 15 Lessons. By that

time you'll know which branch holds the most appeal for you.

You get my usual Instruction Service, Correction Service on your answers to Lessons and Consultation Service on these Advanced Courses. Each Course consists of 15 to 20 thirty-page Lesson Texts. After you have completed your Certified Radio-Trician's Course and the Advanced Course of your choice, I shall gladly tell you how you can get any of the remaining Advanced Courses, if you should be interested in them.

The first school to teach Radio successfully by mail, and the first home study school to offer you extensive practical Radio experience with home laboratory outfits is again the first in a new and decided forward step in home study training—that of enabling you to specialize in the branch of Radio that appeals to you the most.

Advanced Radio Servicing and Merchandising

This Advanced Course is designed to enable you to specialize in spare time or full time servicing and merchandising of Radio sets—either in a business for yourself, or with a dealer, jobber, manufacturer. A detailed outline of the subjects covered is given on page 52.

Sound Pictures and Public Address Systems

Radio made the Talking Movies possible. It also made possible Public Address Systems. This course covers the Phonophone, Movietone and Vitaphone Talking Movie systems. It is designed to train you for this big field. Good men draw salaries as high as \$75 to \$200 a week. An outline of this Course is given on page 54.

Broadcasting, Commercial and Ship Radio Stations

A fascinating field growing and expanding continually is covered by this Advanced Course. The opportunities for which it trains you are described in other parts of this book. The Course is outlined on page 53. As you will see, it covers building, operating, installing and repairing broadcasting stations, commercial code and voice stations as used in trans-oceanic service, ship operating and inter-city Radio communication systems.

Aircraft Radio

The rapid growth of commercial aviation and the use of Radio on planes and in airports has created a new field of opportunity for Radio trained men. This Course is designed especially to cover that field. A detailed outline of the subjects included are given on page 55.

Television

The coming field of amazing opportunities. Many believe Practical Television is almost here. The man who learns the fundamentals of Television now and who has a working knowledge of Television theory and practice will have the jump on the other fellow. This Course is outlined on page 56.

Would not take \$10,000 for N. R. I. training

22nd Obs. Sqr. A. C.,
Brooks Field, San Antonio, Tex.

Dear Mr. Smith:

I would not take \$10,000 in cold cash for the training in Radio I have received from the N. R. I. Any man who wishes to study Radio and wants the best course in the world will take a big step on the road to success when he enrolls with the National Radio Institute. I cleared around \$640.00 doing spare time work on Radio receivers, that sum alone having paid many times for the course. Long before its completion I received many good offers of Radio jobs, but due to my connection with the U. S. Army Air Service I could not take them. I have studied other courses in Radio but I find that the N. R. I. is the best—better than all the rest combined.

Sincerely yours,
CLAUDE L. ALLDAY.



Service Manager for manufacturer says N. R. I. training is best

3009 Scioto St.,
Cincinnati, Ohio

Dear Mr. Smith:

I have had the opportunity of examining many courses given by other schools, but none of them can compare with the N. R. I. course. It is by far the best. At the present time I hold a responsible position in the service department of one of the world's leading Radio manufacturers. I owe my advancement in the service field to the thorough training I received from the National Radio Institute. I have friends in every branch of the Radio profession. They are operators, technicians, service men, employed by prominent broadcasting stations, "talking movies" and well known manufacturers. They are all N. R. I. trained men.

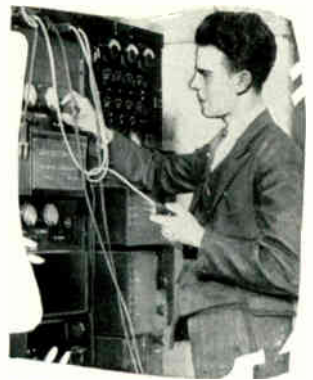
Cordially yours,
LAURENCE J. VANEK



You need not know a thing about Radio or Electricity



I'll give you all you need
of both to be a Radio Expert



Radio Expert operating Equipment installed in Pennsylvania Hotel, New York City.



"Every bit of my Radio knowledge came from your Course"

"One day my attention was arrested by the advertisement of the National Radio Institute and after some deliberation I enrolled for the course. As soon as I completed a few lessons I began to do service work on the side while still holding my job as clerk in a bank. Soon I built up a very profitable Radio business, my gross income for the past three years totaling \$7,645, compared with \$3,150 gross income for the three years preceding my enrollment with the N. R. I. I can truthfully say that every bit of my Radio knowledge came from your fine course."

B. L. SELLERS,

244 N. East St., Monmouth, Oregon.



Knew nothing about Radio or electricity. Earned \$1500 in spare time

"As time goes on, I realize more and more what a wonderful school N. R. I. is and what it has done for me. When I enrolled with you I knew nothing about Radio or electricity. Now I am field service man for a manufacturer and service man for several retailers. Besides my regular salary I have made over \$1500 in spare time work. The satisfaction and new friendships gained as the result of enrolling with you have been worth many times the cost of the course."

P. N. KANTÉN,

507 28th Ave., Seattle, Wash.



Knew nothing about Radio at the start

"I did not know anything about Radio when I started to study, but I know enough now to put most of them around here in the shade. There are very few men in the Radio business who can give the proper service and it is service that brings customers. Despite the depression, my sales have been maintained and my business is in a healthy condition. The N. R. I. with its new Advanced Courses, can qualify a man for any position in the Radio world and so far I have not come across any other course that could give one more than the N. R. I. I am only too glad to recommend this course."

H. W. SOLOMON,
Meaford, Ont., Canada.

You may ask: "How much should I know about Radio or electricity to be assured that I can make a success of your training?" My answer to that question is: "You need not know the first thing about either." I take it for granted that you want to learn everything you need to know to be a Radio Expert and that you expect me to give it to you.

That is exactly what I do. I give you all you need to know about Radio and electricity to be thoroughly fitted for the Radio industry. I start you with the simplest principles, then work up step by step until you have mastered the whole field and its many branches thoroughly.

You supply the ambition—I'll do the rest

I only expect you to bring one thing into this partnership of ours. That is the ambition to succeed, the desire to get ahead, the willingness to try. If you have that—are willing to do your part, follow my instructions, I know you will come out on top and get more than your money's worth.

Many of the graduates whose letters you read in this book did not know a condenser from a rheostat when they enrolled. They did not know the difference between A. C. and D. C. current—but they had the ambition to get ahead—they had faith in themselves and in me—and now they are successful—making more money than they ever did before.

I'll start you at the beginning

This course starts you at the very beginning of Radio. Then it builds up your knowledge just as carefully and systematically as you would lay brick after brick in its place when building a wall. You not only learn the "how" but the "why" also. This way you learn quickly. You get the knowledge you are after—the information and experience, all condensed into a practical training, that the big men in Radio have spent years to discover and work out.

You'll get a lot of personal satisfaction out of studying Radio. You will find it extremely fascinating. There is something thrilling, absorbing, about realizing that as you go along day by day you are mastering this mysterious force. No wonder the Radio Expert finds his work a pleasure. And no wonder that Radio in a few short years has spread over the world like wild fire, growing faster than any industry ever did before.

You get the close personal attention of an expert at all times



When we take over the job of preparing you for the Radio field, we are going to do the job right. So we give you close personal, individual instruction all through your course. We work right with you all the time in a personal, friendly way. Your lessons and your letters receive the personal attention of one of the members of our Staff of Instructors. Any time you need or want help on the course you will get it—gladly and quickly—as every member of my Staff is at your service.

I. R. E. men serve you

Every member of my Staff of Instructors is a Member or an Associate Member of the Institute of Radio Engineers. This assures you of getting the services of men whose Radio knowledge and ability are recognized.

Close personal attention and service like this give you confidence in yourself—in the Institute. Every minute a Staff of skilled men is standing behind you, backing you up, seeing that you advance on a sure footing.

The natural results from this kind of training are quick progress, thorough training. By having you answer each and every one of the questions on

each lesson there is not the least chance of your missing something important that you will need on the job, as is many times the case in class-room work. What you learn from us you do not forget. You have it at your finger-tips. You know how to use it.

You deserve a real chance

Maybe you've never had a real chance before—lots of men haven't. Many teachers and most employers try to help others get ahead by making them over on a cut and dried pattern—such methods never get results with human nature and never will. Every man has his good points and it takes personal training to bring them out—to develop them so as to get the best results.

There is no need for you to go through life with the feeling that success is not for you, but for others. You can get your share too, if you will get training which will bring out your ability. I believe this feature of N. R. I. training is responsible in a large measure for much of the success my graduates are enjoying. It is because we stand behind them, not only seeing that they get the knowledge, but more—taking a warm personal interest in helping them use it to the best advantage. I don't want you ever to have the feeling that the relationship between us is that of student and teacher—but instead that of one friend helping another. Our work is that of making you successful. We know our growth and our future success depend upon your making good.

Letters like these prove the value of personal training



Owes a lot to N. R. I.

"After finishing my tenth lesson, I started on my first job. After that the jobs came rolling in and I found myself with a surplus of money with which to continue paying for my course. My first year's record was exactly 108 Radio jobs. I have cleared the sum of \$2,305 to date, everything being done in spare time. I owe a lot to the N. R. I. for giving such an interesting course. I wish to thank the entire N. R. I. staff for the way you have kept in touch with me after graduation."

JOHN HEARL,

66-53 Jary Ave., Maspeth, L. I., N. Y.



Personal service alone worth the price

"I have made very good money ever since I graduated from the N. R. I. and got into the Radio game. In addition to selling several lines of Radio sets, I have been doing a nice repair business and get quite a lot of repair work on receivers that others have fallen down on. For all this I owe thanks to the N. R. I. course. I can't praise it too highly. The personal service alone is worth the price of the course."

J. OTTO HIGGINS,

333 West Oak Street, Union City, Ind.



Course has netted him about \$7000

"I wish to express my gratitude to the National Radio Institute for the great benefit that its course has been to me. Before completing it I was Radio Expert for the largest sporting goods store in North Carolina. At the present time I am Certified Radio-Trician for the John L. Martin Electrical Co., repairing sets, electric units, etc. I also get a commission on my sales. Radio work is pleasant and there is a great deal of money to be made in this field. Since enrolling I have made about \$7,000 which is a very good return on the cost of the course. I want to thank the N. R. I. and its able instructors for the personal instruction and help given me."

J. F. HUFF,

601 W. 18th Street, Austin, Texas.

Expert Consultation Service

*No
Extra Charge*

Meetings like this with my Staff of Instructors and Department Heads come thick and fast these days. There are a lot of problems to decide in an Institution of this size. Radio developments and training problems, the personal progress and problems of students arise continually. Therefore, I get the advice of my men freely and often. Our advice must be accurate, it must be reliable, because many times a student's or graduate's future depends on it.



*You get the **advice and help** of my experts on your problems as often as you wish ★ ★*



"Thank you for the time and attention given me"

789 North Street,
North Bergen, N. J.
Dear Mr. Smith:

Having completed your course, I want to thank you and the staff of the N. R. I. for the time and attention given me. I never realized how little I knew about Radio until I had completed my first lesson and when that realization dawned upon me, I determined to successfully complete your course regardless of the effort required to do so.

That the lessons mastered have been of value to me is evident when I tell you that during the time I was studying I have earned over \$3100 installing, repairing and servicing Radio sets.

For any man who wishes to become a fully qualified and successful Radio-Trician there is nothing better than the course of study offered by the N. R. I., provided he is willing to do his part by putting his shoulder to the wheel and study as hard as possible. The value of your course to the earnest seeker after knowledge is beyond expression in terms of dollars and cents.

Respectfully yours,
OMER F. LA MARCH.

Although the instruction material in my Certified Radio-Trician's Course, the Advanced Courses, Reference Books and Service Manuals has been written carefully and thoroughly, we realize, here at the Institute, that it is not possible for us to cover every question which you may want explained.

Therefore, we allow you to consult us at any time while you are taking our Certified Radio-Trician's Course or any one of our Advanced Courses on any problems or questions that come up in connection with those Courses. You are not limited to a certain number of questions but are free to ask for help and advice as often as you wish in connection with your studies while you are a student.

I have a large staff here, each man of different experience and training, and between us, I am sure we can explain the questions in your mind so as to make each subject entirely clear to you. As I said earlier in this book, my staff and I want to be more than just teachers and instructors—we want to be your friend and true friendship always calls for rendering such help as can be given, when it is needed.

Whatever you ask us to do for you, whatever you write, will be kept in strict confidence.

I want you to be successful

The one purpose of this Course is to make you successful in Radio. I could leave out a lot of the instruction material and many of the services which I offer you in this book and still give you a good Radio Course. But it is not my object to simply "give you something for your money". I want to give you everything that I believe you will have need for, to get a start—get your first job—and also have a firm foundation on which to build for the future. That is why I offer you Consultation Service. Why I am giving you an Advanced Course so that you can specialize in one branch rather than have a smattering knowledge of all. That is why I give you special instruction material covering spare time jobs as explained on pages 34 and 35. And also why I give you Radio Equipment and instructions for conducting many experiments so that you can get broad practical Radio experience while learning.

YOU Can Build These *and* Many More with the Equipment *I GIVE YOU*

On the previous page I told you that I would start sending you this equipment early in your Course. On this page you see pictures of some of the many devices you can build with this Radio equipment. Let me tell you about some of the experiments you are told how to conduct and the practical applications of these experiments. By now you will understand that each experiment our instruction material shows you how to do has a very definite purpose—a very definite place in rounding out your Radio knowledge. They not only show you how to locate shorts in receiving sets and how to find and replace bad parts, how to build testing equipment and thoroughly understand and apply it, but also cover many of the fundamental principles of Radio in use today in Broadcasting, Commercial and Ship Operating, Television, Aircraft Radio, Sound Pictures and Public Address Systems.

Due to limited space I cannot tell you about all of the experiments. I want to tell you about a few so that you will realize that this is valuable, practical training. For example, one of the experiments deals with electromagnets and how permanent magnets are made from electromagnets. Let me tell you why we take up this subject and these devices. Electromagnets and permanent magnets are used extensively in relays, dynamic speakers, magnetic speakers and the principles of electromagnetism are used extensively in the design and construction of set testing instruments.

Another experiment shows you how electricity may be transferred from one circuit to another without the use of a metallic conductor. It is very important to understand this thoroughly and completely, because, in every phase of Radio—servicing Radio sets, Television, Transmitters and Public Address Systems, electric power must be transposed from one circuit to another without the use of a metallic connection. In the very first unit of this equipment you are shown how to build a simple aural tester with which you can make tests for opens and shorts in receiving sets. A simple explanation is given to show how this device is used in the tracing of defects in Radio and audio systems, whether it is a Radio receiver, transmitter, shortwave receiver, Television apparatus, Public Address System or Talking Movie equipment.

In one of the early experiments you are shown how a simple ohmmeter may be made. There are two simple types; one known as a shunt and the other as a series ohmmeter. Both types are used extensively by service men in repair work, the series method to measure higher resistances and the shunt method to measure lower resistances.



One stage of Radio frequency amplification, detector and one stage of audio frequency amplification for receiving signals.

We give you a series of valuable experiments that teach you the fundamental behavior of a vacuum tube because the vacuum tube is the most important and most valuable of all Radio inventions. Many of our students like to build a simple tube tester for their own service work, so we describe how the apparatus we have given you may be arranged to measure the mutual conductance of various tubes, sufficient information being given to measure all types, including the screen grid, variable mu, pentode, A. C. and D. C. type tubes. Some of the experiments teach you to thoroughly understand vacuum tubes in use as audio and radio frequency oscillators. The experiments with vacuum tubes are so extensive and detailed that I cannot possibly tell you about all of them here.

We furnish you with all the equipment you need to conduct these experiments, including three vacuum tubes, a milliammeter, a voltmeter, a headphone, grid leak, condensers and many other items. The only power you need and which you will be required to supply, will be batteries. The cost of these batteries is a relatively small amount. We shall be glad to arrange a convenient plan for obtaining them at an attractive price unless you prefer to pick them up locally.

When you finish your N. R. I. Course you should not have to take any old job simply to get experience. You will be trained and experienced. You will be ready to take your place beside many men who have been in the Radio field as long as two to four years. It is doubtful whether the average person tinkering with sets or working for a Radio dealer gets as much experience on different circuits in a period of years as you get in a few months.



Tests conducted with modulated oscillator and detector.

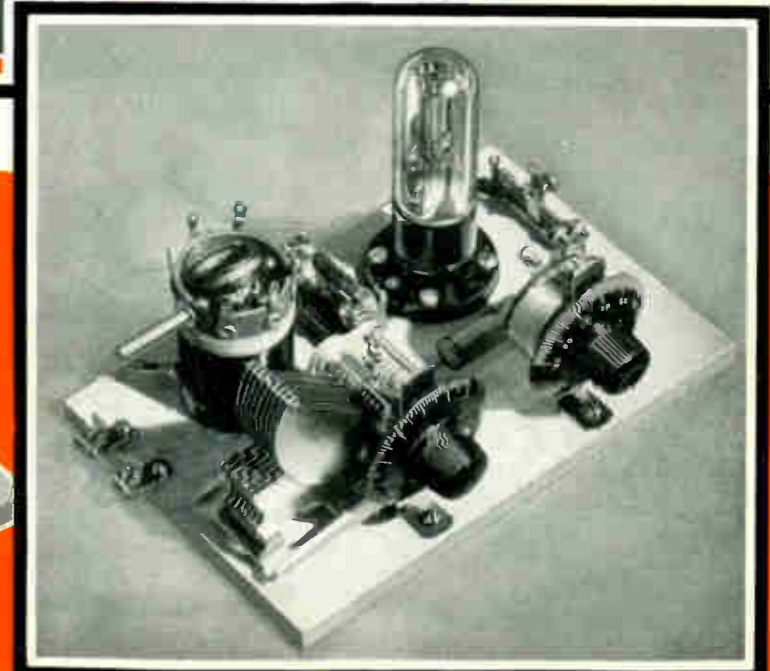


Practical testing equipment for measuring resistance, capacity and inductance with Wheatstone Bridge



A simple tube tester
A set up for taking
tube characteristic
curves.

An audio oscil-
lator



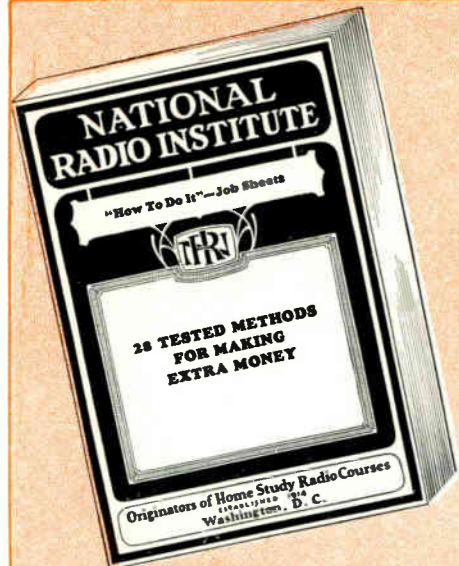
Regenerative detector Radio receiver

This Radio equipment has been selected and the experiments you do with them have been prepared with a view to present conditions. As new inventions come out, new developments take place, it may be necessary for us to make some small changes from time to time either in the actual experiments or in the parts supplied. Therefore, we reserve the right to revise, change and modify this instruction material and this equipment as may be required in order to keep our training right up-to-date, but we promise not to make any changes that will lower the value of this feature of our Course to you.

I show you **28** easy ways to *make extra money*

in your spare time
right in your own neighborhood

the very day you enroll



LIST OF SUBJECTS COVERED

How to find jobs.
How to install aerials for minimum interference.
Underground antenna installations.
Erection of a good antenna.
How to operate more than one speaker from a single receiver.
How to install tone controls.
How line voltage may be boosted.
How to construct wave traps. (To eliminate interfering signals and cross talk.)
How to connect a phonograph pick-up to any receiver.
How to make a good baffle for cone speakers.
Installing loud speakers and receivers in walls, closets and built-in furniture.
How to adapt a "loop" receiver for use with an outside antenna.
How hum may be decreased in the chassis.
How to reduce hum in externally fed dynamic speakers.
Adding A, B & C supplies to battery sets.
How to replace chemical rectifiers with dry rectifiers.
How to recognize and eliminate motor-boating.
How to operate any battery receiver on a 32 volt line.
Adding line ballast to prevent overloading.
Using defective A, E, transformers by substituting impedance coupling.
How to operate 25 cycle apparatus on 60 cycle current.
How to operate 110 v. A. C. receivers on D. C.
Increasing power output by using tubes in parallel.
Shielding set from local interference.
Installing simple interference eliminators (chokes and by-passes).
Short wave adapters.
Paging with small public address systems.
Simple tube tester.
Repairing broken cone speakers.

I will also give you a book which tells you how to get jobs

This book covers the business side of Radio spare time work. Like "28 Tested Methods for Making Extra Money" it was written to help you make profits early in your Course. It covers such important subjects as how to get prospects for service jobs, how to approach them, what to say to them, what to charge, many hints and ideas for getting jobs—for putting your training into practical use. The book also gives information on advertising, writing sales letters, properly working a territory. This book starts where so many training Courses stop—it shows you how to get the jobs for which your training has fitted you.



You won't have to wait one to two years, as is usually the case, to begin "cashing in" when you are an N. R. I. man. I am going to show you how to begin making extra money in your spare time while studying—show you how to begin doing it almost the day you enroll. With the very first assignment of instruction material, I will send you "How to do it" Job Sheets which outline the 28 tested methods for making extra money listed under the booklet pictured on this page. Most of these are simple jobs that you can learn to do very quickly—only an hour or two of study and you should be ready to start out.

You, of course, shall be the only judge as to how much time to give to spare time jobs. It isn't required as a regular part of my training. This is just an extra service designed to help you increase your earnings at once and give

Spare time work keeps him busy



"My service work has held up wonderfully well, keeping me busy on an average of five nights a week. I have a list of customers which has grown steadily, and I think this speaks well for the wonderful training N. R. I. has given me. In these days of super-heterodynes and ever changing circuits, it is the trained Radio-Trician who gets the cream of the service work. 'Mr. Radio-owner' is becoming more educated every day to accept only first class work from service men. I am proud to say that I received my training from the N. R. I. There is no better course in practical Radio than that offered by the Institute."

R. L. HOLMES, JR.,
Room 409, A.C.L.R.R.Co., Wilmington, N.C.

you some fine experience while you are studying.

After you have made some headway in your Course, when you feel you are ready to broaden out your scale of spare time operations, we shall be glad to suggest ways and means of getting spare time jobs. We'll send you the special book described in the panel on this page. Judging from the letters which I receive it doesn't seem to be much of a trick for an industrious fellow to pick up quite a number of extra \$5 and \$10 bills, servicing sets. Many of my students have made \$200 to \$1,000 a year devoting only their spare time in the evenings to doing various types of Radio jobs in their neighborhoods.

Many men, and young men too, who have no intention of giving up their regular work to go into Radio on a full time basis, take up my Course simply because they need and want some extra money and they know that I will show them how to get it. Who wouldn't be interested in picking up anywhere from \$200 to \$1,000 a year doing work that is play? I want to make this point—all of my instruction material is written and arranged so that the beginner can understand it—you should have no trouble learning how to do these jobs and how to apply what you learn.

Clean, pleasant work brings \$1,200

"I want to thank you for the cordial welcome I received when I visited your school recently. From the time I enrolled in the N. R. I., I have been impressed by the personal interest taken in me by your entire staff. I have made more than \$1200 in less than a year. Nine months of this was in my spare time, and all of it by clean, pleasant, congenial work, made possible by the thorough training given me by the N. R. I. The future of Radio is a great one, and I believe the surface of opportunity has only been scratched. My advice to any man looking for a successful future is to enroll in the National Radio Institute now."

JESS W. SPIKER,
400 Elm St., Versailles, Pa.



I give You *The Equipment You Need...* for Broad Practical Experience

I start sending you this equipment early in your Course. Complete and detailed instructions go with this equipment for doing different experiments and for building various circuits and set testing equipment so you know exactly what to do in order to get the greatest benefits from this feature of my training. The individual experiments are easy to perform and require very little time and work.

This feature of my Course has two purposes

One—to show you and to teach you the basic Radio principles it is necessary to know to be successful, no matter whether you go into Broadcasting, Commercial or Ship Operating, Television, Sound Pictures, Public Address Systems, Aircraft Radio or Servicing and Merchandising. No matter what branch you enter you'll find this feature of my course has given you practical usable knowledge and experience of value to you in your work. Two—to teach you to build and thoroughly understand set testing devices, and how to use them in understanding how different types of sets work; how to locate trouble in sets when they do not work, and how to repair them.

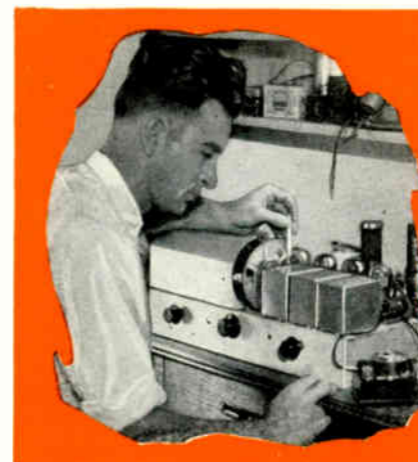
In other words you work out with your own hands many of the things you read about and are told how to do in the lesson texts.

You get the "feel" of tools and meters—you develop a technique in taking Radio apparatus apart and putting it together again. You get that valuable experience which distinguishes one who has had practical experience from the beginner. Training like this shows up in your pay envelope. And it makes learning easy, fascinating, practical.

N. R. I. pioneered this 50-50 method of training

I could give you a Radio set or an inexpensive testing outfit and make it appear that you were getting a big value. But, you are not taking a Radio course to get a set or a set tester—you are doing it to get a thorough knowledge of Radio. Knowledge is the one thing you can sell over and over again.

N. R. I. was the first Home Study Radio School to adopt a method of giving its students practical experience while learning. This 50-50 method of teaching Radio—half from books and half from practical experiments—is now recognized as the best method of teaching Radio. By learning from books and by doing actual work—actual testing and actual repairing—working out for yourself fundamental Radio principles—you don't have to worry when you step into your first job. You know from your training and your experience exactly what to do—you know the "how" and the "why".



With this equipment you learn to build and thoroughly understand set testing equipment—you can use this equipment in your spare time service work for extra money while learning.

Some of the many circuits you build and experiments you conduct

- Connect transformers
- Amplifying an audio signal
- Measuring the strength of an audio signal
- How a vacuum tube is made into a sensitive voltmeter
- Testing a resistance coupled audio amplifier for Radio and Television
- Building a simple regenerative receiver
- How to improve receivers by Radio frequency amplification
- Experiments showing by-passing
- How to make a tube act as a detector
- Building different types of detectors
- Changing A. C. to D. C. current with a tube
- Building a grid dip meter for service work
- Building an ohmmeter for Radio service work
- Generating range of waves by oscillator tuning
- Combining sound and Radio waves
- Building a modulated Radio frequency oscillator
- Effect of coupling on oscillation
- Building a dynatron oscillator
- Building an audio signal generator
- How to measure and show tube behaviors
- Measuring the merit of a tube
- Measuring amplifying ability of a tube
- How tube grid acts as control valve
- Building a device for detecting defective circuits in service work
- Building and testing various audio amplifiers

The experiments illustrate the important principles used in the following well-known receiving sets.

Apex	Kolster
Atwater-Kent	Lyric
Bosch	Majestic
Clarion	Philo
Crosley	Pilot
Edison	R. C. A.-Victor
Fada	Silver-Marshall
General Electric	Sparton
General Motors	Stewart-Warner
Graybar	Stromberg-Carlson
Grebe	Westinghouse
Gulbransen	Zenith
Kennedy	

This feature of my training is a practical Radio education in itself, but you, as an N. R. I. man, will get much more in material and personal service.

This Course is World Famous



I will also give you 8 Service Manuals

Chuck full of Money-making Information ★ ★

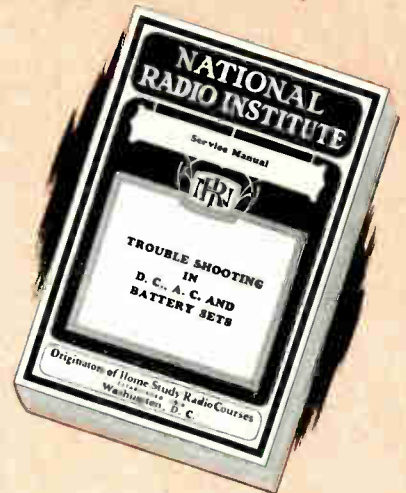
My book "28 Tested Methods for Making Extra Money" mentioned on the opposite page is only a beginning of my help in connection with showing you how to cash in on your training while learning. In addition I give you the material described on this page—two Service Manuals containing the fundamental, vital information necessary for servicing properly all the usual makes of sets. Then you get six Service Manuals full of specific, definite information on more than 70 different sets.

Even if you don't need the extra money, I figure the experience will help you and there are many who do need the money, who might never get the advantage of this Course if I do not show them how to make it pay for itself. Many fellows in school don't care to ask their parents for the money to pay their tuition fee. Many men in low pay jobs can't spare even the low monthly terms I ask. Many a man with a family has found these spare time jobs very helpful in paying grocery bills, doctors' bills, buying little luxuries for his children.

Some have even paid off mortgages on their homes.

Your spare hours—say from 7 to 11—in the evening are the ideal time to do the jobs. Those are the hours of most broadcasting, when most set owners discover their sets aren't working right. In addition to servicing sets there is always a chance to make a profit on parts to be replaced on sets, speakers, batteries and accessories that you can sell. Some students make deals with local dealers whereby they get commissions on sets they sell—and it is the man who fixes a set who has the best chance to sell a new one.

Read the letters on this page for proof that this Course is paying for itself. Then make a list of the many things you would like to have in the next year that your present income does not enable you to enjoy. The fellow who has the respect of his friends and neighbors is a go-getter—a hustler. He keeps his eyes open for ways to serve his friends and gets the extra money other fellows, slower mentally, pass up. And he is happier in the long run.



TWO OF THESE

These two Service Manuals contain the vital, basic service information that you apply to ALL receivers, such as troubles encountered in battery operated sets, troubles encountered in D. C. and A. C. sets, overcoming hum, noises of all kinds, fading signals, broad tuning, howls and oscillations, poor distance reception, distorted or muffled signals, weak signals, poor audio and radio frequency amplification. These Service Manuals also contain information on testing the continuity of any receiver, neutralizing and balancing receivers and testing receivers without meters.



SIX OF THESE

Each Service Manual contains twelve individual Service Sheets. Each Sheet contains a complete wiring diagram of a modern receiver and also specific service information applying to the individual circuit. In all you will get 72 or more wiring diagrams. These Service Manuals are changed continually as new sets are brought out in order to keep them up to date. Listed below are the names of some of the sets which are included in the Service Manuals at this time.

Amrad	Edison	Grebe	Stewart-
Atwater-	Fada	Kellogg	Warner
Kent	General	Kennedy	Stromberg-
Bosch	Electric	Majestic	Carlson
Brunswick	General	Philco	Victor
Columbia	Motors	Radiola	Westinghouse
Crosley	Graybar	Sparton	Zenith



Over \$300 extra one winter

"I made over \$300 in cash and a Twin Evinrude Outboard Motor in trade costing about \$140 in my spare time last winter. I want to thank you for the many Service and Work Sheets. I like the way you keep after your students to get them to study. Most schools would say nothing about sending in lessons as long as the monthly payments came in but not so with N. R. I. I see you want your students to make good."

FRED F. NORRIS,
604 S. Spring St.,
Nevada, Mo.



5 times cost of course in a few months

"The Radio course I took from the N. R. I. has been satisfactory in every way. I am engaged in Radio servicing in my spare time, and have all the work I can do. Financially, I have made five times the cost of the course in just a few months spare time work—over \$500 altogether. On a single job I received \$7.00 for only an hour and a half of work—nothing hard about that."

EDWARD W. BLAIR,
2614 East Main St.,
Lafayette, Ind.



Well over \$300 extra

"Received my Diploma and want to thank you for it. Your service and course have satisfied me thoroughly. I have made over \$300 in my spare time servicing sets. I have made as high as \$40 a month and haven't really tried to get business. Received your Service Sheets and want to thank the Institute for what it has done for me. It is really no trick to make extra money."

ANTHONY YENINIAS,
269 Vine St.,
Plymouth, Pa.

as the One that Pays for Itself



N. R. I. the only place to learn

"I had often thought of entering the Radio field in order to earn some spare time money and make up for what I lose at my regular position. But I could not afford to leave my position and take up class room study, and had no idea that Radio could be mastered by mail. One day the N. R. I. advertisement took my eye. I enrolled and up to the present time have accumulated \$2,300, full credit for which goes to the untiring efforts of the N. R. I. staff. There is only one place to learn Radio and that is from the N. R. I.—a student is not only taught the theory of Radio but also given the practical material to work with."

HAROLD OPPENHEIMER,

104-25 Roosevelt Ave., Corona, L. I., N. Y.



N. R. I. course enabled him to do Radio work with ease

"It is a pleasure for me to write a few lines and tell you that your course has made a real Radio man out of me. I knew but very little about Radio when I enrolled, but the N. R. I. course gave me the foundation and ability to do Radio work with ease. I have found this work very pleasant, because I know what I am doing. This knowledge I gained through the study of your course. I cashed in the neighborhood of \$800 during the time I was studying, the nature of my work in spare time being repairing, servicing and selling. Thank you for your co-operation and the interest you have taken in me since I graduated."

LEO F. CEGELSKY,

1018 N. 2nd St., Albuquerque, N. Mex.



Course simple and easy to understand

"Please accept my congratulations on giving a Radio course which is so simple and easy to understand. I would like you to know just how much your training has meant to me. My spare time earnings this season total \$410.00 for three months' work. It is a great pleasure to know and thoroughly understand receiver circuits and be able to answer the many questions pertaining to Radio. I credit all of this to your course for teaching me just how and where to look for trouble in any make of Radio receiver. I would not give my N. R. I. training for the price of a hundred courses if I could not get another just like it and will always look upon the N. R. I. as the road to success in Radio."

E. B. McDONALD,

3231 Remington St., Jacksonville, Fla.

My Course is

clear, interesting, easy to understand

many of my Successful Graduates did not finish grade school



The Ninth Feature of my course is that it is clear, interesting, easy-to-understand. The lessons are written just as I would talk to you—in straight-forward, every-day, understandable language.

Most any subject seems simple if it really interests a man. The subject of Radio is highly interesting and fascinating. This is best proved by the fact that hundreds of fellows who literally had to be driven to their regular school studies sit up half the night to tinker with their Radio set, delve into this fascinating subject, and master its principles.

We've made this course interesting

You don't find page after page of dry technical matter in this course. We know that the more interesting we can make this training for you, the easier it will be for you to learn. So we have made the course absorbing, have left out all useless theory that is found in so many other courses.

But this Course is not all theory. What you learn from the lessons you work out with the home experimental outfits I have already told you about in this book. This method keeps your interest alive, you are always anxious to learn more. And you learn

better. A man forgets the things he doesn't like to learn. This way you learn and remember.

Lack of high school education no drawback

You will get directly to the heart of everything—learn exactly how everything is done. You will learn how to take advantage of all the things that we've learned in our years of experience.

We have written this course for the man who hasn't had the chance to go very far in school because we know that by teaching in simple terms which are easy to understand, we are helping the man who needs our help most. We also know that the fellow who has gone through high school or college will likewise find it interesting and easy to apply himself to the lessons after his daily work. You will look forward to the time you can give your course and home experiments with my outfits as the most interesting and refreshing of the whole day. You will enjoy these lessons—many students say they are as fascinating as books of fiction.



Lack of education no drawback

"The National Radio Institute has meant a great deal to me from the standpoint of increasing my income. It has brought me over \$800.00 in spare time work, selling and servicing Radio receivers while studying your wonderful and interesting course in Radio theory and practice. Lack of education is not a drawback, as your course is very clear—easy to understand. Considering the knowledge I have gained, I may say that it is an education in itself. It is worth several thousand times the price I paid for it. Your training has made me many new friends and I have been consulted on many problems which others have failed to solve. Thanks to the N. R. I., I can say with pride that I have succeeded."

FORTUNAT CADIEUX,

110 Nonotuck St., Holyoke, Mass.

"My Boys" get promotions and raises in pay through my Vocational Service



My Vocational Service is under the direction of Mr. P. J. Murray (also Manager of my Employment Department). As my student, you can get a number of services through this Department. For one thing, Mr. Murray can get in touch with your employer and let him know that you are studying Radio with us. Of course, no one at the Institute would ever write your employer without first getting your permission. So before writing, he will take this matter up with you and will send you a copy of his letter to let you know just what is taking place. As a matter of fact, we wait until the student suggests that we write his employer. So let us know when you feel that a letter from us will help you along—boost you a step up the ladder to bigger pay or a better job.

Some students don't want us to write their employer feeling that it might jeopardize them in their present jobs since they plan to leave them as soon as they graduate. We are extremely careful not to do anything that will hurt your present connection until you are absolutely ready to step out. On



When there are important problems to decide it is the man who is thoroughly trained in Radio who is called in and consulted. Believe me, employers like to know that they can depend upon the help and advice of men in their organization in solving their problems. It takes the responsibility off their shoulders—and puts you in good with them, too.



The managers—"We want to tell you how glad we are to know that you are devoting some of your spare time to perfecting your knowledge of Radio. A letter from the N. R. I. just told us about it. That's good news for us. Keep up the good work and some day we may have some good news for you, too."

the other hand, many employers are mighty pleased to know that their employees are studying in their spare time to make themselves more valuable in their organization. Every progressive em-

ployer has his eyes open all the time for men who are fitted to take more responsible jobs. At once you become a marked man in their eyes because of your industriousness, standing above the others who are not doing what you are doing. If you are not in Radio work now, letters from us may help obtain a transfer to the Radio Department.

My Vocational Service has another side to it. One that is even more important than help-

ing you ahead with your present work. It is the fact that upon graduation we help you get into the right line of Radio work, the position for which you are best fitted by previous training and experience, inclination and temperament because when we make your job fit in with all those factors you are going to make a bigger success.

You, like every man, have your own personality, your own tastes, your own inclinations. Mr. Murray is quite an expert in sizing these up, and with your co-operation, and after consulting with you, he will be able to help you in many ways. Keep this Vocational Service in mind and when you get your training under way and know of any way in which we can help you to get ahead where you are, or make a change to another department, let us know how to do it. We shall certainly do everything in our power to boost you along.

MASON & RISCH, LIMITED
230 Yonge Street
Toronto 2, Ont., Canada

Mr. P. J. Murray,
National Radio Institute,
Washington, D. C.

Dear Mr. Murray:

We have your letter and are very pleased indeed to have the information you give us regarding George McKey, now employed at our St. Catharine's Branch.

The writer is personally acquainted with Mr. McKey and we have always found him to be the right kind of an employee and one who is deserving of encouragement and assistance.

You can rest assured that he will not be overlooked and that if there is any opportunity in our organization where he can be used to better advantage to ourselves, which of course, means to better advantage for himself, he will be given every consideration.

Yours very truly,

MASON & RISCH, Limited
(Signed) F. E. BIGGS,
Retail Manager

FEB/H



My Employment Department

Will help you find a job UPON GRADUATION

When you have finished your last lesson and have received your Diploma, we don't turn you loose to "paddle your own canoe". Then is when we step in and perform one of our most valuable services. Through my Employment Department, of which Mr. P. J. Murray is Manager, we help you find a job. We do this work for you without extra charge, and neither do we charge the employer.

To my mind this is one of the most valuable services any school can render its graduates. It is only natural that we should know more avenues leading to possible jobs than our average graduate, because we are better acquainted with the field—because we personally know many of the men high up in the bigger companies who have direct charge of hiring trained men for their plants.

Employers in this and other countries know what N. R. I. training stands for. We spend a great deal of money every year acquainting them with the thoroughness of our training and with the type of man who takes it. Furthermore, the splendid records N. R. I. men are making for themselves everywhere, give you a stand-in with employers.

Some of the men who have direct charge of hiring employees are N. R. I. graduates themselves and naturally they like to give members

Recommends the N. R. I. Course for an increase in pay envelope



1928 Lacombe St.,
Newberry, Pa.

Dear Mr. Smith:

My first position with the General Electric Company was entirely due to the help I received from the N. R. I. Later I had a recommendation to join the staff of Radio-Tricians of the New York Power & Light Company where I had full charge of the Radio Service Department. Then I was transferred to the Amsterdam Division where my salary was again increased. Besides holding down my regular job, I also earned over \$1,000 extra doing spare time Radio work. During the past winter I have been doing Radio service work and acting as Service Manager for Permar's Radio Shop. I can recommend the N. R. I. course to anyone who wants to increase his pay envelope and live a happier life.

Very truly yours,
R. L. MORRISON



P. J. Murray

I want you to know Mr. Murray. You'll find him a conscientious fellow who will work as hard for you as anyone in my organization. Many an N. R. I. graduate owes his job to Mr. Murray's help. A natural go-getter, he likes his work, likes to help people. Besides, he says that he gets a kick out of this job that he never got out of any job he ever held before. You can imagine how satisfied a fellow is when Mr. Murray lands him in a good job and how tickled the man is who has been a graduate for several years and comes back and finds he can still get the help of our Employment Department—that we are just as anxious to help him as ever before.



Employment Department placed him in Broadcasting Station

"Upon graduating from your Institute, I accepted a position as service man and within three weeks I was made service manager. This job paid me \$40 to \$50 a week, compared with the \$18 a week I earned in a shoe factory, before I enrolled. After doing service work for eight months, I obtained a position as operator with Station KWCR through your Employment Department. From KWCR I went to Station KTNT, which has a power of five thousand watts. Shortly after, I again changed and became Radio Engineer of Station WSUI. Your instruction service is excellent and your text books make the most complicated parts so simple that anyone can understand them. I will certainly recommend the N. R. I. to all interested in the greatest field of all 'Radio'."

SYLVANUS J. EBERT,
1913 State St.,
Boise, Idaho.

of their school family first choice. Both the Employment Department and the Vocational Service are under the direct and active charge of P. J. Murray. No one will work harder to see you win out in a big way than Mr. Murray. He is for the N. R. I. man first, last and always. He got his job because he has a record of getting what he goes after.

Long experience in the business world has taught me that as a general rule the larger the claims that are made, the smaller the proof to back them up. So instead of giving you promises to judge my Employment Service, I want you to judge it by results. I want you to read the letters on these pages, both from students and employers. I haven't picked letters from the biggest firms only, neither do I give you letters here of all of the men we have placed. Some of the firms you read of here you probably never heard of, others as you will see, are world famous.

N. R. I. placed him with Sears-Roebuck



"I shall never regret the day I enrolled for the N. R. I. course, for I am sure it has kept me from being one of the many thousands of good people walking the streets today. At first, I was reluctant about enrolling because my education is limited to grammar school. But I found that your lessons were arranged in a simple and systematic way which could be easily understood. Soon after finishing the course, I landed a position in the Radio department of Sears Roebuck & Company as a result of your recommendation. I appreciate the cooperation you showed and the interest you took in helping me secure that job. I am in business for myself now and am getting all the work I can handle. Most people have some money and they are going to spend a part of it to keep the old Radio in good working condition. I have done well in the Radio field—bought a home and paid for it with the money I have made. My earnings have ranged all the way from \$125 to \$350 per month."

J. H. ANDERSON,
1520 Mims St., Atlanta, Ga.

Use this Service as often and as long as you wish Absolutely no extra charge

On the opposite page I told you that we were not going to turn you loose when you finished the course and let you shift for yourself, to make out as well as you could on your own efforts. No, sir. I'll help you as long and as often as you wish without any extra charge.

One year, two years, three years or even many years after you graduate, the services of my Employment Department will be open to you. It is possible that after you graduate you may step into a job that you find on your own efforts or that someone will offer you. Then again, many students have jobs in mind as soon as they graduate. Sometimes these jobs do not turn out as well as expected. I'll be ready and willing to help you in every way I can through my Employment Department.

We don't sit back and wait for jobs to turn up

Although a lot of jobs come to us from employers because they have heard of the Institute or know the reputation of our graduates, we don't sit back and wait for jobs to turn up. We spend several thousand dollars every year operating our Employment Department, writing letters to dealers, jobbers, manufacturers, broadcasting stations, to keep N. R. I. popular. Sometimes graduates tip us off to jobs. Sometimes graduates, in business for themselves, ask us to recommend assistants. We want to popularize our Institute, popularize our graduates. Therefore we boost them in every way we can. It is to our advantage as much as it is to their own. Our success depends on our graduates' success.

I doubt if there is another Radio school that spends as much time, effort, thought and money on its graduates as the N. R. I. Certainly it is to your advantage to hook up with a school that looks after you when you graduate. Your training is going to be worth only as much to you as the use you make of it.

Other things we do for you

We coach you on writing letters of application, arranging interviews with Employment Managers who want men. A large number of companies have copies of our course in their library. Not long ago we mailed 40,000 copies of a 16-page booklet describing the Institute and the work it is doing, for the express purpose of boosting the N. R. I. graduate to the firms which have use for your services. So when I tell you we are going to help you find a job I mean that we are going to do a thorough job of it. No halfway effort will do here. Every man and woman in this organization is taught that it is to his or her personal interest to do a thorough job of serving our students and graduates. The better job we do of it that much bigger we are going to grow and the more opportunities they are going to have in our own organization.

These letters show employers recognize worth of N.R.I. men

Unfortunately the letters below are all I have room to show you. On the right, however, I show you how extensively N. R. I. graduates are employed.

WKBH hires N. R. I. man

"Please be advised that Mr. Freeman Smith of Holton, Indiana, one of your students, arrived today for the position of Assistant Chief Engineer. Thank you for your assistance."

A. LEEMAN,
Chief Engineer,

Radio Station WKBH, La Crosse, Wis.

Canadian firm hires our men

"Our experience has been that it is very hard to engage men properly qualified for Radio service work, and we take this opportunity of congratulating the National Radio Institute on its work in training men. We have two men who received training through you. We must say that they are about the most capable in the Province of Ontario."

WENTWORTH RADIO SUPPLY CO., Ltd.

31 John St., Hamilton, Ont., Canada

Pleased to have our graduate

"You will recall that several months ago I wrote you to assist me in getting a licensed operator for KGCK. I am pleased to inform you we were fortunate in securing the services of Dallas W. Jensen. Mr. Jensen is a fine type of fellow and we are pleased to have him with us. I will always have a good word for the N. R. I."

E. E. KREBSBACK,

Westland Oil Company,
Minot, N. Dak.

Wanted a sales manager

"We are looking for a sales manager and it occurred to us that you may know of someone whom you think could fill this position. We are willing to pay a salary in keeping with the ability we need."

SUPREME INSTRUMENT CORPORATION,

Greenwood, Miss.

Operator placed

"We have placed aboard our Steamship *Georgeanna Weems*, Mr. Charles B. Judson, who wrote in reference to a position and stated that you referred him to us. His address is 3 Columbia St., Cherrydale, Va. Many thanks."

A. H. BULL & COMPANY, INC.,
Steamship Agents and Ship Brokers,
115 Broad St., New York.

Thanks N. R. I. for his job

"I am glad to write you and thank you very much for the way you have helped me into a position. I have plenty to do and am getting a lot of good experience which will be very valuable to me in the future. Right at the present time experience is worth more than anything else. Many thanks for what you have done for me."

JOHN HAJDUK, JR.,

3 Broxey Apts.,

Southern Hills, Dayton, Ohio.



11th
STAR
FEATURE

Some of the firms and broadcasting stations that have employed N. R. I. trained men

Atwater Kent
Alden Mfg. Co.
American Bosch
All-American Mohawk Corp.
American-Pioneer Steamship Co.
American Transformer Co.
Brodrick & Blair
Bull Steamship Co.
Bremer-Tully Mfg. Co.
Crosley Radio Corp.
Canadian National Railways
Canadian Marconi Co.
Canadian Westinghouse, Inc.
CeCo Tube Mfg. Co.
DeForest Radio Co.
Davega, Inc.
Dayton Power & Light Co.
Detroit Edison Co.
F. A. D. Andrea Co.
Grigsby-Grunow Co.
General Electric Mfg. Co.
Montgomery Ward and Co.
National Broadcasting Co.
Philco-Phila. Storage Battery Co.
Radio Corp. of America
Ozarka, Inc.
Sears, Roebuck & Co.
Sparks-Withington Co.
Stewart-Warner Speedometer Corp.
Silver-Marshall, Inc.
Stromberg-Carlson Mfg. Co.
U. S. Naval Research Laboratory
U. S. Bureau of Standards
U. S. Dept. of Commerce
Westinghouse Elec. & Mfg. Co.
Western Electric Co.
Zenith Radio Corp.
Wentworth R. & A. Supply Co.
Acme Wire Co.
American Tel. and Tel. Co.
Buffalo Courier Journal
Doubleday-Hill, Inc.
Detroit Edison Co.
Thomas A. Edison, Inc.
Firestone Tire & Rubber Co.
Ludwig Baumann & Co.
N. Y. Edison Co.
Penn Central L. & P. Co.
Pacific Air Transport
Wright DeCoster, Inc.

Broadcasting Stations:

CKCL	KWWG
CNRO	WSIX
KWCR	WHAD
WBEN	WLW
WBZ	WENR
WJAK	KFJB
WKZO	WKJC
WRC	WRNY
KSL	WAAM
PWX	WCSH
WMAQ	WGBI
WJAX	KGFI
WBOW	WGOC
WOL	WHBY
WCBD	WCOC
KMOX	and others.

10 Valuable Reference Books without Extra Charge!

12th STAR FEATURE

Although it is not a required part of your course that you study these ten books in order to get your diploma, I am sure you will want to do it. They contain valuable information for which you should have considerable use. These books will be sent you with my Certified Radio-Trician's Course and you can read and study them at your leisure. The two books of which you can see only the tops on this page are devoted to Radio Mathematics, making four in all on this subject. The student who can add, divide, multiply and subtract shouldn't have any trouble understanding my Certified Radio-Trician's Course or any of the Advanced Courses. However these four books on Radio Mathematics are for those who want the fine points on Radio Theory. They give the Mathematics which the average laboratory assistant should know in order to do his best work.

Extra training brings extra opportunities

It is a recognized fact that the best minds usually get the best places. The man who keeps on plugging away, who doesn't think that he knows it all after getting a start, but keeps on pushing ahead, comes pretty close to reaching the top. I want to say again what I have said on some previous pages—it is not my object to simply give you enough information about Radio so that you can get some kind of a job. My object is to give you a really good Course—a Course that you will be very proud to show to your friends—a Course that you will be glad to recommend to your friends—a Course that will give you such a complete and rounded out knowledge of Radio that you yourself will know when you come in contact with other Radio men that most of them not only have nothing on you insofar as knowledge and ability is concerned, but that the great majority of them are not up to your standard.

\$80 per month in spare time

"Any one who can read and write should be able to make good money in Radio after studying with the N. R. I. I have a good laboratory of my own, do Radio servicing in spare time and have been kept busy all the year round, with business gradually increasing. I make on an average of about \$80 per month profit during the winter season and have received back the cost of the course many, many times. I would not be getting all this extra money if I had not studied with N. R. I."



REX B. SMITH,
600 South St., Sault Ste. Marie, Mich.

Earns over \$4,000 in Radio work

"Since taking your course I have made over \$4,000 in Radio. Besides doing repair work, I have held a position in a Radio factory as inspector and tester. Recently I started in the service business for myself and have been keeping busy. I really believe if it weren't for taking the N. R. I. course which started me in Radio work, I would just be another one of the army of unemployed. I wish to thank you for the courteous, prompt and efficient attention given me during my training."



JACOB G. DU BOIS,
9 Oak Crescent, Poughkeepsie, N. Y.

\$900 in spare time while taking course

"Your thorough manner of explaining each subject in detail, in language that I could understand made it possible for me to service sets within a very short time. My full tuition fee was soon realized from my repair profits. I earned about \$300 in repair work and \$600 from sets that I built and sold. I cannot speak too highly of the course. It has taught me to know what to do and how to do it."



ARTHUR WIELAND,
729 Jackson Ave., Elizabeth, N. J.

You get my Valuable Radio Magazine

NATIONAL RADIO NEWS



The day your enrollment reaches me, I put your name on my list to receive National Radio News regularly. You will be sent a copy of every issue without additional charge while you are taking my course. Many people are paying \$2.00 to \$3.50 a year for Radio Magazines, which, while larger in size and containing more pages, have little if any more information in them than you can put to use making money. The National Radio News is not just a "house organ" put out to advertise the Institute.

It costs me over \$500 to get out every issue, but I am willing to spend that to keep my students posted on what is going on in Radio, in the way of the most important news, new developments, service information and other data of interest and value. Most of my students file the News very carefully, keep it for reference, because each copy contains one or more valuable articles.

A wide range of subjects is covered. In many instances the News carries information of value to the man in the Radio field—instruction material long before it is put into the average Course. For example, as soon as automobiles started

coming out with Radio sets, the News carried a detailed article on "How to Install an Auto-Radio Receiver".

The News is not always written entirely by men in my organization. Such prominent engineers as A. H. Grebe, A. Atwater Kent, E. W. Gager, C. F. Jansky, Jr., and many others have contributed in the past. Some subjects covered in past National Radio News issues include—"Radio Is the New School Bell," "Pointers on Public Address Systems," "Capacity Measurements with a Wheatstone Bridge," "Hotels and Apartments Are Good Radio Prospects," "Delco-Remy R-54 Receiver For Automobile Installation."

The material is not kept down to technical Radio information, however. Ideas for managing a spare time or full time business, success letters from students and graduates to inspire you by showing you what others are doing and have done, vocational articles giving tested plans for getting ahead where you are and for getting a job, and others are run from time to time. I am sure you will enjoy the News and find it very valuable.

A few of the many interesting articles that have appeared in the "News"

- Servicing Information on the Sparton Equasonne Models 301 and 931
- Inductance and Capacity Measurements with a Wheatstone Bridge
- The Army's Radio Ears
- Service Information on the Graybar 700, General Electric 31, Radiola 80 and Westinghouse WR5 Super-heterodyne Set
- Service Information on Brunswick Models 15 and 22
- How to Add a Tone Control
- Service Information on Philco Model 30
- Adding Additional Loudspeakers
- Crosley Buddy and Chum Receivers
- Majestic Models 130, 131, 132
- The Company Behind Graham McNamee
- WGY's 200 KW Broadcast Transmitter
- New Vacuum Tubes—Types 30, 31, 32 and New Power Pentode
- What the Well Equipped Service Man Carries
- Using a Voltmeter for Measuring Resistance



Head Radio man for Stutz Motor Car Company

1422 Haugh St., Indianapolis, Ind.

Dear Mr. Smith:
Your training has done more for me than anything else and you have never at any time failed to give me help when I needed it. There are several N. R. I. men in this city and I notice that everyone of them are busy all the time while other service men are not doing anything much. I am now the head Radio man at the Stutz Motor Car Company of America. In spare time I repair Radios for the home and install Radios for several auto sales companies.

Yours for more success,
E. A. MATTHIAS

**"A wonderful study from start to finish."
\$1,800 in spare time**

14105 Lorain Ave.,
Cleveland, Ohio

Dear Mr. Smith:

I want to thank you for the beautiful diploma I just received. My opinion of the N. R. I. course is that it is the best to be had at any price. When I enrolled, I didn't know the ground from the aerial, but after four months of training I made all kinds of money repairing sets, building and selling them, installing, trouble shooting, etc.

To tell you that I am more than satisfied is putting it very mildly—it is a wonderful study and interesting from start to finish. I consider my course with the N. R. I. worth many times its cost to me. It would take a mighty big bunch of money to buy my knowledge of Radio received through your training, if I had to part with it.

I picked up \$1,800 while studying, and I call that easy money—the time I gave my Radio work did not interfere with my other business.

Very truly yours,
OTIS DENTON



My Course gives you *all* you need to know



to make good money and have a foundation
for *quick promotions and advancements in Radio*

It is Thorough and Complete



**N. R. I. training
thorough and practical**

Route No. 1,
Amsden, Ohio

Dear Mr. Smith:

Just a few words to the National Radio Institute, thanking you for all the co-operation you have given me since I took your Course in Radio. Your training is thorough and practical. Anyone can be proud to say, "I graduated from the N. R. I.". The personal help you give is worth many times the cost of the lessons, for the N. R. I. Course makes one feel sure of himself. I do all kinds of Radio service work, specializing in the installation and service of auto Radios. I have cleared \$975.00 in the last six months doing Radio sales and service work.

Very gratefully yours,
EVERTTE W. NEDERHOUSER

My course stands on its own feet. It is easy to learn. It is practical. It is thorough and complete. When you have completed the N. R. I. course it won't be necessary for you to look for a job where you can get practical experience. Neither will it be necessary for you to take further training from any other school. The many letters from graduates given in this book prove positively that it fits you to make good money in this ever expanding field.

It goes from one end of Radio to the other. It always builds upon its own foundation. The lessons are so clear, everything is told in such direct, plain terms that most anyone can understand them easily.

N. R. I. is not connected with any outside companies

I firmly believe that a school, in order to serve you faithfully, must be independent of outside control—also free from other things only remotely connected with training. Therefore, I have always steered clear of alliances with other organizations. We are not associated or connected with any other school or any Radio organization financially or otherwise. This gives you as a student and graduate a number of

advantages. It enables us to cultivate friendly relations with all Radio companies. As a result, our source of information on Radio sets is not limited to a few manufacturers, but we can choose freely from the very best of them. Thus you get up-to-date, complete and accurate information—not on one or two makes but all of them. We have not allied ourselves exclusively with any engineers or writers but take the work of all we can use. This gives you a broader range of information—equips you better for the Radio field.

This course is up-to-date

In a field growing as fast as Radio, constant changes and revisions are necessary. Our entire course is revised approximately once every year. Old material that has become obsolete through new inventions is thrown out and new material put in. A Radio course that is not kept up to the minute by regular revisions and changes cannot give you what you need to succeed. In my opinion, a training is only as good as what it enables you to do and to make. The best proof that my methods are successful is the many letters from students and graduates in this book.

In Charge of Distributor's Service Department. Services Thousands of Sets

11649 Mansfield Ave.,
Detroit, Mich.

Dear Mr. Smith:

Since taking your course I have serviced something like 20,000 Radio receivers and speakers. With the knowledge gained from N. R. I. as a foundation, I was able to take on new sets as they came out, working from battery receivers to electric, the new screen grid jobs up to the present modern superheterodynes with automatic volume control, and meter or neon light tuning. Your course, if conscientiously studied and applied, will enable anyone to systematically check and locate trouble in any receiver.

I have been working for a local distributor for a little more than three years and for the past year and a half have had charge of the service department. Radio is very interesting and usually offers the very best in working conditions. I would not take anything for the knowledge derived from your course.

Yours sincerely,
LESLIE ANDERSON

Received more than he ever paid for. N. R. I. Instruction "can't be beat"

3810 So. Gunnison St.,
Tacoma, Wash.

Dear Mr. Smith:

I want to congratulate the N. R. I. on its method of instruction and the personal attention given each student. Personally, I feel that I received far more than I ever paid for. I am always so busy with repair work that quite recently I have added another man to my force, and by the way, he is an N. R. I. student. Both of us are putting in long hours to keep up with the demand for our services. I am from time to time adding to my present stock of equipment with supplies and have at present over \$1,000 invested—all paid for from my earnings while learning.

In closing, I want to thank you for my diploma and most of all for the knowledge I have received from your instruction, which *can't be beat*.

Respectfully yours,
E. L. ROWE





Willard C. Howe

Associate Member Institute of Radio Engineers. Formerly Editor of Radio Merchandising and Radio Topics, has specialized to a considerable extent in merchandising methods. First Radio experience dates back 30 years. Has contributed valuable material to our Course on Advanced Radio Servicing and Merchandising.



Raymond F. Yates

Author, sixteen technical books including A. B. C. of Television. Formerly—Managing Editor of Popular Science Monthly, Popular Radio and Television—lecturer for the New York Board of Education on Radio—Radio Editor of New York Mail and New York Tribune. Member—Hoover Radio Conference, 1925—also I. R. E. and A. S. E. E.



Robert S. Kruse

Graduate U. of Kans. Electrical Eng. Connections since—Circuit Lab., Western Electric Co.; Radio Instructor, Signal School of U. S. Army; Bureau of Standards, left as Associate Engineer; Hammond Radio Research Corp.; Technical Editor of QST. Now Consulting Engineer on short wave problems and devices.



Jesse Marsten

Graduate College of the City of New York. Former connections include Radio Engineer with Marconi Wireless Telegraph Company; Radio Engineer for the Radio Corporation of America; Chief Engineer for Freed-Risemann Corp.; Chief Engineer of Earl Radio Corp.; at present Chief Engineer for International Resistance Co.



Sylvan Harris

Rec'd Electrical Eng. Degree Univ. of Penna.; Power Maintenance work 1917; Technical Editor Lefax 1922-23; Managing Editor Radio News 1923-25; Director, Research and Design Stewart-Warner 1926-27; Brandes 1927-29; Research Div., F. A. Andrea 1929-30; 1930 to date Technical Editor Society of Motion Picture Engineers. Member I. R. E.

These PROMINENT RADIO ENGINEERS helped make N.R.I. Training the Outstanding Course in Radio!

This is not a one man school—not a one man Course. Radio is too large—your future too important—to trust the matter of writing all the ramifications of Radio principles and Radio's adaptations to one man. My Courses represent the best work of our own staff, myself, these eight men and many others. I have drawn on them for their experience and knowledge in order to give you the kind of training I believe you want and I know you need.

It is my object in this book not only to show you what I give you, but why I give you the material and services that I do, and also show you what I have done to make sure that your training will be complete and thorough.

Any one of these eight men could give you several hundred dollars worth of Radio information in a short time by simply drawing on their personal experiences—information that I do not believe



Charles Felstead

Graduate, Electrical Engineering, Los Angeles Polytechnic H. S. Constructed and operated KZY and KDBG. Took engineering and journalistic course Univ. of Southern Calif. Did experimental work in the research laboratory of Gillfillan Radio Corp. Radio Department of Universal Pictures Corp. 1928, helped build KGHV and KGHW for maintaining contact between picture companies on location and main studio. Later transferred to Sound Department as sound engineer. Member American Radio Relay League, Institute of Radio Engineers and Society of Motion Picture Engineers.

you could find in text or library books. In fact, my Course represents a simplified accumulation of the work and experiences of hundreds of prominent engineers.

If you were to attempt to discover by yourself all the facts in this Course, I do not believe you could do it in a lifetime. I know you couldn't do it. Sometimes we don't realize what a great service our scientists are rendering when they pass on to us their invaluable discoveries and experiences gained only at great personal sacrifices.

The experiences and information that made others great and successful in the eyes of the world are here—waiting for you—ready to direct you to success also. Will you accept this opportunity?

Educated in Electrical Engineering, George Washington and Columbia Universities. Former connections—Radio Test Lab., Navy Yard, Washington, D. C.—promoted to Research Engineer. Four years with C. Brandes, Inc., became Chief Research Eng. on acoustical development of headphones, loudspeakers and pick-up devices. 1926-28 Asst. to Chief Eng. developing receivers, amplifiers and automatic control, Federal-Brandes. Now acting Chief Eng. Kolster Radio Co.



C. E. Brigham



Joseph Calcatera

Formerly Information Editor, Popular Science Monthly, later Radio Editor. Syndicated daily Radio articles which appeared in such papers as Chicago Daily News, Pittsburgh Press, Washington Star, Columbus Dispatch, Boston Globe and others. Has written constructional and general bulletins for Radio manufacturers. At present connected with Aerovox Wireless Corporation. Editor of house organ "The Research Worker."



15th
STAR
FEATURE



You can finish Quickly

(Most Fellows Graduate in 8 to 12 Months)



Wouldn't sell course for any amount of money

"I was only an electrician's helper when I enrolled. Immediately after finishing the course I went to work for a Philco Radio store, then to the Philco factory branch at Dallas and finally to my present position as Service Manager for the Philco State Distributor at Oklahoma City. I am making \$150 a month which isn't so bad for a fellow who has only recently become 21 years of age. I believe Radio is the most promising and best paying field and would advise any man to get into Radio if he wants to get ahead. I wouldn't sell my N. R. I. course for any amount of money."

R. B. CHERRY,
3 W. 10th St.,
Oklahoma City, Okla.

Most men and young men who enroll with me have only their spare time to give to their Courses. Most of them are working, and some are working and going to school too, but take this Course in addition. The average time required to complete this Course is from eight to twelve months. Since there are some students who, due to their occupation or for other reasons, are not able to finish in that time, I allow every student three full years in which to complete without extra charge.

You are in a class by yourself

I want to make it clear that I encourage you to progress at the speed which suits you best. With me it is not a case of keeping up with someone else, or being held back by those who may be slower than you. As soon as your enrollment reaches me I send you a supply of instruction

material so that you can get started. I send you enough so that you can always keep busy even while your answers to one or two Lessons are on the way to be graded. Your graded answers are returned with model answers so that you can check your answers with absolutely correct ones. All the material I send you becomes your personal property when you have finished your Course.

Hold your job. You need not give it up—go to a strange city at great expense to become a Radio expert. I will bring my training to you, and you can study when and where it is convenient, at the time when you feel capable of doing your best work. Your spare time is plenty. You need not give up your regular source of income to learn Radio. Keep on working until you are ready to step out into a better job.

ONE Low Price

Covers *all* of my ★ ★ ★
★ **18** Big Star Features



When you become my student, or rather I should say, my partner, in this undertaking of preparing you for a bright future in Radio, you need have no fear that you will be asked to pay more for tuition than the amount given on the enrollment blank. My Lessons and other material are copyrighted by us and are all covered by this one fee. The Home Laboratory Outfits are also included.

Furthermore, no matter how much use you make of our Consultation Service while a student, Employment Service after graduation and other services which I tell you about in this book, you will never be asked to pay extra for them.

Don't overlook the fact that you are not simply investing in a certain number of Lesson Books and Radio Equipment. You are investing in yourself—your future.

You are not simply buying material to sell. You are buying knowledge and information that you can sell over and over again—year after year. Investing in knowledge pays dividends year after year as long as you live.

When I take over the job of preparing you for your future career, I feel that I have accepted a serious responsibility. I feel that you place a trust and faith in me that does not allow me for one minute to forget that between us we have the shaping of your future for the next five, ten or perhaps twenty years. I know that I cannot afford to be careless, neglectful, haphazard in my service, incomplete in the information I give in my Course, without it affecting your future in some way. It is my idea to make as big a success of you as I can—not to get as much out of you as you will stand for.

Knowledge worth many times cost of course

"After studying your first fifteen lessons, I was able to easily locate the cause of set troubles and remedy them. Since enrolling, I have made at least \$3500 net. Many times I have said to myself, 'I do not see how you do it with the small amount of tuition fee you charge for this course.' Personally, I would not take many times the price it has cost me for the knowledge I have gained through your training."

C. J. STEGNER,
28 So. Sandusky St.,
Delaware, Ohio



This HANDSOME DIPLOMA

is your
introduction
to
*Radio
Jobs*
on
**Land
and
Sea**



YOU GET IT UPON GRADUATION

the most thorough home study Radio training that can be had today.

It is sent free of all extra charge, postage paid, when you finish your lessons and pay in full. Your diploma entitles you to all the rights and honors of a Certified Radio-Trician including the Advanced Course you select. For example, if you take the Course in Aircraft Radio your Diploma will read "Certified Radio-Trician, Specializing In Aircraft Radio". If you take Advanced Radio Servicing and Merchandising it will read, "Certified Radio-Trician, Specializing in Advanced Servicing and Merchandising".

I know that your one object in taking this Course is to either get a better job or to make money in your spare time—or both.

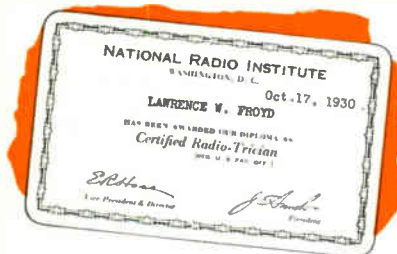
That is why I have told you throughout this book about the thoroughness and completeness of my course. Why I give you practical experience with Radio

I believe I can say, without fear of contradiction, that this Diploma stands for the most complete,

parts equal to and perhaps more than the average fellow who enters the field without this training gets in two to four years. That is why I show you how to start making money early in your course—to give you valuable experience and make it possible for you to add to your income without waiting a year or two as is usually the case.

You don't have to take another course when you finish this one. All of the practical, result-getting information you need is given in this one training. When you master this course you will be so clearly acquainted with all the "ins and outs" of Radio that additional training—classroom or otherwise, would simply be covering the same ground twice.

Set \$3,000 to \$5,000 a year as your goal. Many salaries in Radio go higher than that. With N. R. I. training behind you, you'll be confident, regardless of how big the job or how high the salary, that you'll have the thorough, practical knowledge to fill it. And long after you graduate, we, here at the Institute, will be watching you, helping you whenever we can so that your highest ambitions can be realized.



A reproduction of the card furnished upon graduation for convenience in carrying.

These men help me give *You*



Joseph Kaufman



J. A. Dowie
Chief Instructor



S. M. Armstrong



George J. Rohrich

My right hand man in giving you this training is an old timer in the Radio game. Mr. Dowie has been with the Institute over ten years. His long experience serving hundreds of students and graduates makes him an ideal man for his position as Chief Instructor. He knows my course backward and forward, has contributed a great deal toward making it as complete and thorough as it is today. A member of the Institute of Radio Engineers, a contributor to Radio magazines at different times, he has won my confidence in his ability to supervise and direct his assistants. You will enjoy knowing and working with him.

Joseph Kaufman

Supervisor of Education. Supervises the writing of new instruction material, writes many Lesson Texts himself and supervises Consultation Service. Graduate of M. I. T. in Radio M'fg. business 7 years.

George J. Rohrich

His interest in Radio dates back about 15 years. He has charge of the research work we do here in connection with arranging and preparing the practical training we give with our Radio Equipment.

Don B. Looney

Mr. Dowie's assistant in collecting and preparing up-to-date service information on different makes and models of sets.

Albert F. Doig

Manager of my Mailing Department. He keeps his assistants "stepping" all the time so that you get prompt service. There is no lost motion in getting out Letters, Lessons and Units with Doig on the job.



Don B. Looney



Albert F. Doig



F. L. Sprayberry

S. M. Armstrong

Director of Student Service. He is keenly interested in seeing every N. R. I. student get prompt personal service—one of your most loyal friends here.

F. L. Sprayberry

Instructor under Mr. Dowie in grading Lessons and answering letters from students and graduates.



David H. Smith

David H. Smith

Another Instructor under Mr. Dowie, who grades Lessons and helps answer students' and graduates' letters.

Henry K. Bradford

His extensive experience in servicing broadcast and short wave receivers and transmitters, broadcasting experience and long association with Radio makes him a valuable assistant to Mr. Kaufman.



Henry K. Bradford

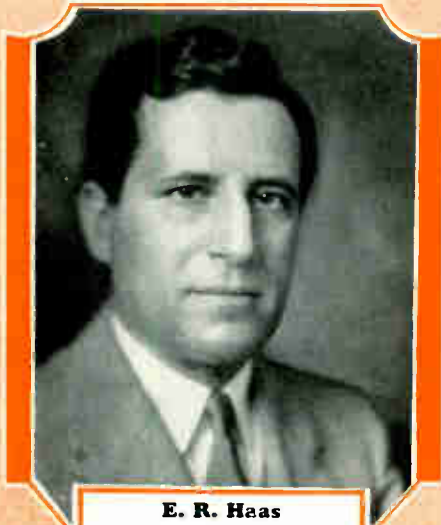
They have over 75 people helping them to serve you

The men whose pictures I show you on these two pages are my Department Heads and some of their Assistants around whom I have built my organization. I haven't space to show you photographs of all my Staff as there are over 90. All of them give their full time to the Institute. I believe I have a unique, in fact a remarkable organization. I never saw a group of men and women so impressed with the spirit of loyalty and personal service. Everyone seems to realize I depend upon them individually to give his or her best personal efforts to serving you—to be prompt, courteous, accurate and helpful to each student and each graduate, day in and day out. They are not working *for* me—they are working *with* me and working for you to the very limit of their ability.

prompt and efficient Service



Gordon Birrel



E. R. Haas
Vice-President



Edward L. Degener



B. S. Lavins



William W. Saunders, Jr.



Harold E. Luber

Mr. Haas assumes the executive and business responsibilities which arise in conducting the Institute, leaving me practically free to give all my time and effort to students, graduates and to the course. He is particularly well qualified by his extensive knowledge of organization methods to administer the business affairs of the Institute. Gifted in business matters and administration, his work in keeping down costs is largely responsible for my being able to give my course for its present low price.

Gordon Birrel

Office Manager in charge of personnel and co-ordinating the work of our different departments, assuring students and graduates prompt and efficient service.

Edward L. Degener

Director of Publicity. Under his supervision students and graduates are getting favorable write-ups in their local newspapers which is good advertising for them.

B. S. Lavins

Auditor and Chief of my Accounting Department. Accurate and up-to-date records are necessary on every student. Mr. Lavins sees that we have them.

William W. Saunders, Jr.

High school and business college graduate, is a valuable assistant to Mr. Armstrong in giving the students and graduates prompt service.

Carl F. Weber

In charge of student supplies. It is his duty to see that we have sufficient quantities of study material on hand at all times to make prompt shipments to students.

Harold E. Luber

A valuable assistant in connection with preparing our literature and rendering student service.

T. A. Lambert

One of Mr. Kaufman's assistants in connection with writing and keeping our Courses up-to-date.

J. G. Hollingsworth

Devotes all his time to giving information on our school and Radio opportunities to prospective students.

You profit from the 17 years it took to build this Organization

You cannot afford to speculate—gamble—on the training on which your entire future depends. Do not risk your future on somebody's "overnight" idea. The National Radio Institute's training is not an experiment. This school, this organization, this course have been developed steadily over 17 years. Back of N. R. I. methods and N. R. I. training stands this unequalled experience in training ambitious men and young men for Radio. It is only natural, therefore, that we can offer more and better training than any organization just starting out or one that has been in existence just a few years.



J. G. Hollingsworth



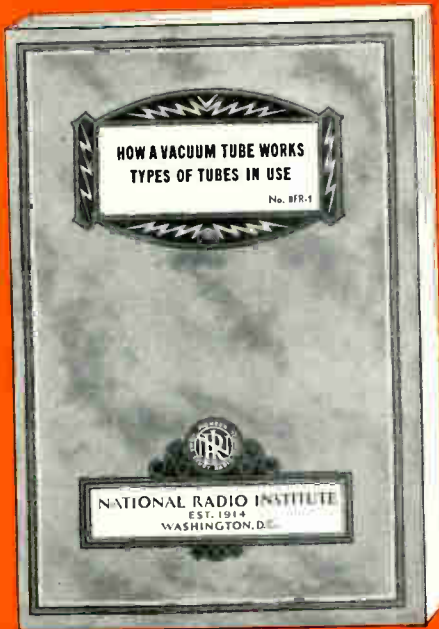
T. A. Lambert

These Subjects and many more are covered in my *Certified Radio-Trician's Course*

The subjects listed on this page and on pages 49, 50 and 51 are thoroughly covered in my Certified Radio-Trician's Course. Read them over carefully. Remember, this is not my whole course, by any means. You also get Service Manuals containing a large number of Service Sheets, and innumerable privileges and services. These Lesson Texts and other material teach you the "why" and then you learn the "how" with your



Radio Equipment. I believe I can say without fear of contradiction, that my Course is the most complete, practical and thorough home study Radio Course offered today. It is only natural that I should be able to give you good value. Our seventeen years' experience specializing in training men and young men for Radio only, our large organization and staff of trained and experienced men, make it possible.



A Bird's-Eye View of Radio

A discussion of Electricity and the Electron Theory—Magnets and Magnetism—positive and negative terminals and their significance—two methods of determining the direction of magnetism about a wire, carrying current—Ohm's Law—production of Radio Waves—transmission and reception of Radio Signals—tuning a receiver—apparatus used in a Radio receiver—function of the Radio frequency amplifier and audio frequency amplifier—detector.

The Language of Radio-Tricians

Photographs, sketches, symbols and diagrams, and their use in Radio—Study of graphs and curves; their importance in practical Radio—Tables: table of comparative resistance of various metals, table of Radio abbreviations and metric tables and their American equivalents—the use of tabulated data in Radio—equations—difference between equations and formulas—formulas as "tools" in Radio.

How the Radio Receiver is Supplied with Power

Difference between static and dynamic electricity—action of like and unlike charges—electron theory—applied to charges—thermoelectricity—methods of producing electric current flow—difference between primary and secondary cells—table showing different electrical potentials existing between metals—cells connected in parallel, series and series-parallel—storage batteries and their construction—advantages of the Edison battery over other batteries—action of the lead cell—purpose of the hydrometer—electromagnetic induction—A. C. and D. C. generators.

Practical Radio Circuits

Meaning of an electrical circuit and its essential parts—electrical networks—a parallel arrangement of loads connected to a common source through common transmission lines—sources of e. m. f.—conductors and insulators—relative resistance of conductors—characteristics of series circuits—characteristics of parallel circuits—a typical Radio receiving set

and power unit—electrical measurements—the internal construction of an ammeter—purpose of the D. C. voltmeter.

How Resistors are Used to Control Current Flow

Various electrical factors that oppose the flow of current—application of Ohm's Law—explanation of Kirchhof's two laws—the meaning of conductance—purpose of a voltage divider; of a microammeter—the American Standard Wire Gauge—wire constants for standard annealed copper wire—relative resistivities of various wires using copper as a standard—effect of temperature on resistances—various types of resistors in every day use.

Radio Coils — Why and How They Work

Magnetic effect of current flow—mutual induction and self-induction—typical Radio plug-in coils—short wave transmitting and receiving plug-in coils—broadcast transmitting coils and single-layer coils used as standards of inductance—inductance—units of inductance: the henry, microhenry and millihenry—factors which determine the amount of inductance of R. F. coils—inductive reactance—the effect of inductance on phase—Lenz's Law—transfer of electrical energy from one circuit to another without direct connection between them—electrical inertia—the effect of inductance upon an alternating current.

Radio Condensers—Their Function and Operation

Constructional details of a simple condenser—illustration of various types of fixed condensers and of a variable condenser—the action of a condenser—hydraulic analogy, showing how a condenser is charged with direct current—hydraulic analogy illustrating the flow of alternating current through a condenser—discharging a condenser—factors upon which the capacity of a condenser depends—oscillatory circuits—the fundamental oscillatory circuit—damped waves and undamped waves—dielectric constants for various materials—capacities in parallel and in series—capacitive reactance—phase relation of voltage and current in A. C. capacitive circuits—resonance—types of Radio condensers.



Customers Advertise him

"Since I finished the first few lessons of your Radio course, I have had as much Radio work as I could do in my spare time. This work has netted me a nice profit, many times more than the course cost me. I have received more benefit from the course than I thought there could be in a correspondence course. My satisfied customers are my only advertising. The other men here who tinker with Radios are not giving satisfaction, so all the work is coming my way."

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Complete, Thorough, Tested and Proven It makes You a Recognized Radio Expert

How A Vacuum Tube Works—Types of Tubes

Reasons why a vacuum is necessary in a Radio tube—origin of the Edison effect—difference between the thoriated filament and the plain tungsten filament—uses of the diode tube in Radio—the Fleming valve as a rectifier—function of a simple two-element vacuum tube—the effect of gas in a tube—the three-element tube and its origin—symbols used in tube classification—tube bases and sockets—A. C. filament tubes; power and rectifier tubes—construction of an A. C. screen grid vacuum tube—the pentode tube—uses of the vacuum tube—explanation of electron emission—difference between a hard and a soft tube—effect of space charge on plate current.

Radio Transformers and Principles of Tuning

Mutual induction between coils—induced e. m. f.—a discussion of transformers with illustrations of typical transformers—effect of mutual induction on inductance—impedances in series circuits—reactances in parallel circuits—comparison of series and parallel resonance—ways in which a resonant circuit can be tuned to various frequencies.

How a Three-Element Tube Amplifies

Functions of an ordinary tuned R. F. receiver—uses for audio amplification—phonograph reproduction—electrical recording—power amplifiers—what constitutes an audio amplifier—amplifier tube characteristics—components of A. F. amplifier systems—voltage amplification—amplification constant (μ)—coupling devices and systems—push-pull amplification—maximum undistorted power output—typical amplifier circuits—voltage amplifier and power amplifier circuits—necessity for matching impedance.

Iron Core A. F. and Power Transformers

Radio devices in which magnetic circuits are used—laws of the magnetic circuit—comparison of electric and magnetic circuits—series magnetic circuits and parallel magnetic circuits—meaning of magnetomotive force—meaning of reluctance in magnetic circuits: of magnetic permeability—explanation of flux density—usefulness of B-H curves—meaning of magnetic saturation—causes for the loss of power in transformers—meaning of hysteresis or magnetic inertia—eddy currents and how eddy current losses are reduced in transformers—meaning of leakage flux—ratio of primary voltage to secondary voltage—audio frequency transformers.

How a Two-Element Tube Rectifies A. C. in Power Pack Operation

Voltages that must be supplied to operate vacuum tubes—the half-wave rectifier and full-wave rectifier—the filter unit—voltage output and regulation of rectifiers—rectifying tube characteristics—characteristics of the '80 type tube—the voltage divider and its purpose—input and output voltage regulation—typical A-B-C supplies—required A. C. rectifier voltage.

Various Voltage Supply Methods for Radio Equipment

A-B-C supplies for storage battery tubes; for dry cell tubes; for A. C. tubes; for D. C. tubes; for two-volt tubes; for batteries; for 110 volts D. C.—advantage of the air cell over the storage battery or dry cell—

type of rectifier used for high power rectification—important uses of the dry rectifier—differences between self-bias and bleeder-bias for obtaining "C" voltages—uses of motor-generators, rotary and frequency converters—general rules in making filter chokes and condensers—special rectifying systems for A-B-C supplies—methods of obtaining "C" bias.

Changing Sound into Electricity and Electricity into Sound

The nature of sound; sound waves—the speed of sound waves and interference of sound waves—illustration of a sound wave showing overtones—differences between echo and reverberation—conversion of sound energy to electrical energy—factors that determine pitch and timbre of musical sounds—explanation of modulation—the simple microphone circuit—the double button microphone circuit—the condenser microphone circuit—speaker units; the permanent magnet unit; the balanced armature unit; the moving coil unit—wave form and distortion—sketch showing curve representing waves and harmonics—decibels in expressing loss or gain in sound intensity.

The Vacuum Tube in Audio Frequency Stages

Functions of a receiver—importance of audio amplification—the common coupling systems used in audio frequency amplifiers—essentials of voltage amplification—factors that control the true voltage amplification of a tube used as an amplifier—amplification constant (μ)—coupling devices and systems—a simple explanation of impedance matching for maximum power output—purpose of using power tubes in push-pull arrangement.

The Vacuum Tube in Radio Frequency Stages

The main parts of a receiver—sensitivity and selectivity—fidelity—side-bands—by-passing and choking—three coupling systems used in Radio frequency amplifier—a typical A. C. operated receiver—hum, its cause and remedy—need for grid bias voltage—tubes used in Radio frequency amplifier—impedance coupling—instability of R. F. amplifiers—a typical chassis of a screen grid receiver—shielding—ways in which self-oscillation may be prevented.

How a Vacuum Tube Acts as a Detector

The function of a detector in a receiving set—process of modulation and demodulation—the detector and its operation—crystal detector receiving circuit—detector of the C-bias type—diode detectors—magnitude of detector output—typical power detector—degree or percentage of modulation—distortion in power detectors—how to calculate audio output—automatic bias—grid leak and condenser detection—oscillating detector and a heterodyne detector—autodyne type of receiving circuit.

Screen Grid, Variable MU, and Pentode Tubes

Undesirable feed-back—maximum amplification from triode—limitation of triode R. F. circuits—screen grid tube construction—amplification factor—by-passing for screen grid—shielding—circuit constants—screen grid tube performance—coupling for screen



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grid tubes—selectivity of screen grid circuits—sensitivity—voltage gain calculation—screen grid tube as an audio amplifier—as a space charge amplifier—as a detector—power pentode—characteristics—voltage and current values for pentode—sensitivity of pentode tube—R. F. pentode—characteristics—variable mu tubes—high mu tubes—low mu tubes—mutual conductance of variable mu tubes—typical circuits—load requirements—method of volume control.

R. F. Circuits and Methods of Controlling Volume

Antenna circuits—regenerative receivers—systems used for controlling re-radiation—fixed and tuned R. F. receivers—typical modern Radio receiving circuits showing the difference between a battery powered receiver, an A. C. powered receiver and a D. C. powered receiver—methods of volume control—by-pass condensers and R. F. chokes—cross-modulation.

The Radio Frequency Amplifier and How it Works

Analysis of R. F. amplification—correcting regeneration—three main groups of stabilization—losser method—neutralization method and the phase shifting method—two causes of oscillation—suppression of oscillation by methods of neutralization—the Rice method of neutralization—reversed feed back method—elimination of tube capacity—elimination of magnetic stage coupling—shielding and its importance—method of matching plate impedances—R. F. problems—high frequency resistance—Radio frequency couplings.

The Vacuum Tube as a Generator in Radio Circuits

Theory and use of tube oscillatory systems in Radio—effect of "C" bias on oscillating current—power efficiency—typical oscillating circuits—use of oscillators as sources of A. C. for measurement work—the series Hartley oscillator and the shunt Hartley oscillator—the Armstrong tuned-plate tuned-grid circuit—the Meissner circuit—method of coupling load—three ways of modulating a continuous wave—the audio oscillator—harmonics.

Tuners and Wave Filters

Simple resonant circuits—coupled circuits—the fundamental tuned circuit—the effect of reflected values—equalizing selectivity and sensitivity—R. F. band-pass circuits—carrier wave and side-band frequencies—audio frequency filters; the band-pass filter, the high-pass filter, the low-pass filter, the single band filter, the two-band filter.

The Modern Superheterodyne Receiver

Comparison of superheterodyne with tuned Radio frequency—advantages of superheterodyne—sections of a superheterodyne—analysis of individual parts—sensitivity—selectivity—adjusting the oscillator stages—synchronizing oscillator tuning condenser—intermediate frequency transformers for frequencies from 50 to 500 kc.—effect of the second harmonic of an oscillator—two dial superheterodyne—single dial control—one spot tuning—super-regeneration—limit of amplification in a super.

How to Select a Good Radio Receiver

Receiver characteristic curves—the construction and purpose of a phantom aerial—how extreme selectivity is obtained in the I. F. stages of a superheterodyne receiver—typical circuits used in broadcast receivers—illustration of a typical commercial generator used in making selectivity, sensitivity and over-all fidelity curves.

Photocells and Glow Lamps

The photocell action—the effect of light on electron flow—sensitivity in the different light spectra—types of cells—how applied to Television—modern photocells—electrical characteristics—forward and reverse circuits—neon tubes (gas-filled)—the life of a photocell—the correct position of the cell—operating requirements—photocell circuits and their practical applications—typical relay; glow lamps; need for a lamp sensitive to changes in current—the neon lamp; the effect of gas on color—the Raytheon Kino-lamp—the Aeo-light—ultra-violet light rays used for direct film action.

Loudspeakers and How they Operate

Loudspeakers divided into two main groups; magnetic and electrostatic speakers—details of the bi-polar type headphone unit—balanced armature units; dynamic units; fundamental difference between magnetic speakers and dynamic speakers—types of loudspeakers; horn type, the conical horn and the exponential horn—details of the original Hopkins Cone—the purpose of a baffle—field excitation for dynamic cones.

Recent Developments in Loudspeakers and Tone Controls

Inductor dynamic speakers—the airplane cloth speaker—condenser speakers—tube-to-speaker coupling devices—loudspeaker response curves—tone control—method of measuring sound power output—methods of installing a tone control in detector, audio or output A. F. stages.



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GUY E. SAUNDERS,
Mesilla,
New Mexico

Current Measuring Devices and Their Uses

The meaning of the meter constant of a D. C. milliammeter—calibration of meters—galvanometers; the D'Arsonval galvanometer—the principle of the thermocouple ammeter—D. C. Ammeters and milliammeters—means of multiplying operating ranges—thermoammeters—thermocouple ammeters—magnetic vane ammeters—electrodynamometer A. C. ammeters—oxide rectifier ammeter—current oscillographs.

Voltage Measuring Devices and Their Use

D. C. voltmeters—electrodynamometer voltmeters—magnetic vane voltmeters—copper oxide A. C. voltmeters—thermocouple voltmeters—multipliers—high voltage measurements—hot wire and oscillograph voltmeters—vacuum tube voltmeters—measuring resistance—the ohmmeter—the megger (megohmmeter)—measuring power—output indicators.

Measuring Resistors, Coils and Condensers—Testing Radio Parts

The Wheatstone bridge and illustration of a typical portable Wheatstone bridge—the meaning of "decade box"—capacity bridges—inductance bridges—frequency measurements—high frequency meters—wavemeters—Piezo oscillators—standard audio and Radio frequency sources—magnetostriction oscillators—R. F. coil measurements by resonance methods—approximate capacity of filter condensers—difference between a wavemeter and a frequency meter.

Receiver Refinements

Method of connecting condensers where plate circuits are tuned—ganged condenser matching—matching coils—the split rotor plates—the single control superheterodyne—remote control and automatic tuning—special circuits employed—remote volume control—automatic volume control—visual tuning with automatic volume control—phonograph pickup—connection of filters—impedance matching.

Short Wave Receivers and Transmitters

Short wave communication—a detector circuit—regeneration—oscillation—typical oscillatory circuits—circuit action—short wave coils and condensers—four methods of tuning described—

the audio amplifier—the R. F. system—types of coupling—the short wave superheterodyne receiver—shielding the short wave receiver—practical short wave circuits for the designer—list of parts—coil data—winding short wave coils—short wave transmitters—adjustment and operation of short wave transmitters—the wavemeter, as used for adjusting transmitters.

Transmitting Antennas and Their Radiation Characteristics

The transmitting antenna and the two factors on which its effectiveness depends—the electric and magnetic fields—theory of radiation—ground and counterpoise systems—the free wave in space—the action of the Heaviside layer on Radio waves—the Hertzian antenna system—the difference between a Zeppelin and a doublet antenna—ground reflected rays—distribution of radiated energy—antenna constants—indirect antenna coupling—the wave antenna for long wave reception beam antennas and the advantages of beam radiation—a two-wire Radio frequency transmission line and its purpose.

Power Audio Amplifiers

Two types of amplification that must be provided for in an audio amplifier—power output and formulas that apply—over-all amplifier calculations—transformer intermediate coupling and its advantages—the three-element type output tube circuit—four-element type output tubes in parallel and push-pull—the purpose of hi-mu tubes used in resistance coupled stages—the voltage gain formula—resistance couples intermediate amplifiers—impedance coupling—push-pull intermediate stages—calculation of intermediate amplifiers—permissible grid swing—response equalization.

A Modern Transmitting Installation

Microphone pickup—remote pickup—block diagram of typical broadcast station—the studios—the condenser microphone circuit—portable speech amplifiers—the crystal oscillator—the buffer amplifier—the modulated amplifier—power stages—R. F. transmission lines—the dummy antenna—the radiating system—power supplies—block diagram of the master and monitoring control room.



Makes nice profit in sales and repair business

"I cannot speak too highly of the N. R. I. It has really taught me Radio, so that I do not have to guess. I have had a number of good offers to work for different Radio stores, but I did not accept them because I wanted a business of my own, which I now have. I took in an N. R. I. student as my partner and we handle five of the most popular sets made, the name of our company being 'Supreme Radio Sales & Service'. I find that a well trained Radio man can always get lots of business, whether times are good or bad. I would have to check my books to know how much I have made, but I am kept busy repairing and selling, so you can feel sure I have made a nice profit. I couldn't handle all the business that comes my way alone."

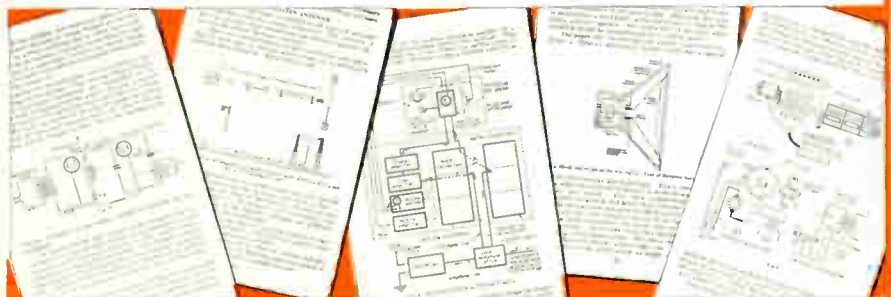
W. S. COFFEEN,
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Course worth thousands to him

"Your course is worth thousands of dollars to me. Only last fall I made \$700 in my spare time. I have a good job in a factory here and do all my servicing in spare hours, as this is a small town. I am the service man for a dealer here who sells Philco, Grebe, Bosch and Silver Radios; also authorized service station for Silver Marshall. To the left in the picture of my work shop you will see a tester built by me which will analyze all Radio troubles. I certainly advise anyone who wants to get ahead in life to take up your course at once."

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Here are my Five Famous ADVANCED COURSES



One year's business—\$30,000

"Between the money I made on my service work and the commissions I earned selling Radios, I paid for my N. R. I. Course in a very short time. The lessons were so easy for me and everything was explained so thoroughly that I never for one instant was afraid of tackling any job. I decided I wanted a store and went into business with another fellow. We opened up in January and did a business of \$30,000 in one year's time. At the end of my first year in business I bought out my partner's end, and then started manufacturing Midget Radios along with my retail sales business. I can truthfully say that I owe my success to the N. R. I. Course."

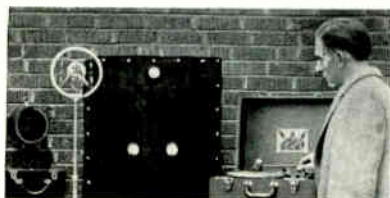
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Specializes in Public Address Systems—\$3,600 to \$4,000 a year

"Thanks for the Service Sheets you mailed me. They cover all the principal types of receivers I work with and I find them a great help. Your course has given me the greatest feeling of confidence in anything I undertake in Radio. At the present time, I am acting as Field Engineer for the Central Public Address Systems, a position in which I feel I can serve well due to your thorough training and one in which the compensation is expected to run about \$3,600 to \$4,000 a year with bright prospects for advancement."

PAUL E. REISS,
3015 Regent Place,
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Specialized Training in Radio Servicing and Merchandising

This is the first of my Advanced Courses. The limited space on this page does not permit me to give you a complete outline of all the subjects covered. However, I believe you can judge from this partial outline how valuable training of this kind is to the man who wants to do service work—in business for himself, spare time or full time, or working for a dealer. In offering you a choice of one of these Advanced Courses I am making it possible for you to get much more training in the branch of Radio that interests you, than you would ordinarily get if all five fields were covered in one Course.

Installation Service

The Radio-Trician—his position in Radio—preparing a receiver for installation—transportation—installation in the home—antennas—demonstration—finishing the job.

Radio Servicing in the Home

Purpose of the first service call—receiving and preparing for the call—questioning the customer—tools and parts needed—set analyzer, audible continuity testing—locating the trouble—line, aerial and ground inspection—need for a definite trouble shooting procedure.

Testing with Meters at the Work Bench

Principles of all measurements—multipliers and shunts—circuit tracing—circuit checkers—ohmmeters—vacuum tube voltmeters—a service bench test panel.

Testing Vacuum Tubes

Tubes as a source of trouble—voltages and currents measured—mutual conductance, amplification factor and plate resistance static measurements—bridge methods—emission and gas tests—value of tests—service and counter tube checkers.

Testing Sound Reproducing Devices

Testing phones, magnetic and dynamic units—magnetic and dynamic cones—condenser speakers—continuity and resistance test—magnetic strength—remagnetization—defective cords—grounds—clearance—loose wire—rattles—what to repair—notes for service man.

Bench Servicing of Power Supplies

A. C., D. C. and battery receivers—using circuit diagrams—interpretation of analyzer readings—power circuit continuity testing—calculating the replacement resistor—checking amount of hum—battery testing—repairs and replacements.

Bench Servicing of A. F. Equipment and Power Amplifiers

Stage to stage test using phone and local broadcaster—using speaker and audio oscillator—making, calibrating and using a tube output meter—thermocouple and rectifier output meter—Hartley and beat audio oscillators—signal generator fidelity tests.

Bench Servicing of R. F. Equipment

Stage to stage test—R. F. oscillators and signal generators—standard signal generator receiver performance tests—electrical and mechanical alignment—output indicators—selectivity, fidelity and sensitivity curves.

Testing Receiver Parts

Testing gang condensers for shorts, leaks, alignment—tuned R. F. and superheterodyne—testing R. F. coils for continuity, grounds, shorts and inductance—tests of I. F., detector and A. F. circuit parts—special resistor and iron core inductance and filter condenser tests.

Testing Power Supply Parts

Testing transformers for continuity, resistance, grounds, shorts, output voltage, temperature rise—testing iron core coils for air gap and inductance—by-passing and filtering—testing paper and electrolytic condensers for shorts, capacity and leakage—testing resistors for value and noise—small condenser, volume and tone control tests and repairs.

Internal Receiver Noise

Classifying noise—determining whether noise is external or internal—irregular noise—tube noise—control device noise—noise due to resistors, defective insulation, partial shorts—regeneration noise causes—balancing out regeneration—A. F. regeneration—mechanical, resonance, microphonic, loudspeaker noise—systematic and stage by stage noise tracing.

Receiver Hum

Origin of hum in filament, rectifier tube, power transformer, filter system defects—neutralizing hum—stage by stage and interstage localizing—hum in A. C. operated dynamic speakers—hum modulation—hum due to wiring.

External Receiver Noise

Classification—static—picked up noise—building and using interference finder—noise filters—supply and high voltage line interference—motor, generator, electrical street railway, telephone, telegraph, interrupters, oil burner, lighting plant and general interference location and methods of elimination.

Radio Drafting and Blueprint Reading

Importance—assembly drawings—line and apparatus designations—reading assembly drawings, example—drafting tools—panel detail—panel dimensioning—layout and wiring diagrams—cable detail—art of lettering.

Special Radio Installations

Need—portables and midgets—types, installation, noise suppression of automobile Radio—indoor and outdoor sound installations, pickup, coupling, transmission, loudspeaker and power requirements—remote control adaptation.

Acoustics in the Home—

Superheterodyne Troubles, Remedies
Locating the receiver—correct output level, superheterodyne circuit subdivision—identification of "super" circuits by chassis inspection—aligning I. F., oscillator, preselector circuits—selectivity and sensitivity—trouble shooting—image suppression—superheterodyne troubles and remedies tabulated.

Specialized Training for the GOOD JOBS

in Broadcasting, Commercial and Ship Radio Stations



The jobs for which this Course fits you are varied and fascinating. As you know there are over 600 Broadcast Stations in the United States, Commercial Land Stations dot our Atlantic and Pacific Coasts and they are also being put up in our cities to compete with Telegraph Systems; in addition there are over 2000 American ships Radio equipped. I want to say here that in order to get the license which is necessary to hold some of the jobs in Broadcasting Stations, the jobs in Commercial and Ship Radio stations, you must have a knowledge of sending and receiving code. My special Code Course is described on page 57.

Development of Commercial Radio

Induction coil transmitters—mechanical and electrolytic interrupters—spark transmitters—antenna coupling systems—the fundamental arc circuit—early receivers, Hertz loop, coherer, electrolytic, magnetic, tone wheel, arc heterodyne detectors—tuning circuits for detectors—diode and triode tube circuits—regenerative receivers—Alexander alternator, theory, armature and field construction, signaling transformer, multiple tuned antenna—Goldschmidt alternator, theory of operation—the tube transmitter.

The Arc Transmitter

Action of the D. C. carbon arc—the singing arc, theory of arc oscillator—the arc as a voltage supply control—blow-out magnets—coupling arc oscillator to antenna—double radiation, back shunt, ignition key, compensating wave, nodal point keying systems—tuning the arc transmitter antenna—arc electrodes—a typical arc transmitter, circuit analysis, the arc converter, starting and operating the arc, the cooling system.

Spark Transmitters

Power supply—motor-generator, battery and emergency battery systems—overload-underload breaker and relay—meters—motor starters—typical spark transmitter circuit, circuit division, tuning circuits, antennas, changeover switch—damping—non-synchronous and synchronous rotary, quenched spark gaps—coupling and decrement—impact, mercury valve, converted tube and emergency transmitters.

Pickup Devices; Speech Input Analysis

Construction, operation, circuit adaptation, electrical characteristics, field of use, output level, tube amplifiers required—single and double button carbon microphones—condenser, ribbon and inductor microphones—rubber and oil damped magnetic phonograph pickups—elements that all speech systems have in common—coupling devices—monitors—line amplifiers—lines—line equalizers—sound levels in typical systems.

Impedance Matching Networks, Pads and Volume Controls

Source, line, load impedance matching theory—primary impedance when secondary is open, loaded—reflected impedance—ideal and practical matching transformers—choosing a matching transformer—commercial matching transformers, multiple connections—coupler for tube grid input—L, T, H fixed impedance matching pads—constant impedance volume controls—faders—mixers.

Transmission Lines, Volume Indicators, Monitors

Communication fields requiring transmission lines—source, line, load—resistive line; surge resistance, attenuation factor—terminal impedance for long and short lines—impedance line, surge impedance, attenuation, phase shift—loading—balanced and unbalanced artificial lines—repeaters—standard line input levels—power level indicators—transmission efficiency—impedance matching pads and transformers—line amplifiers—monitors—low, high, bandpass, band elimination filters—pi and T sections—cascading—equalizers.

Modulation in Tube Transmitters

Pickup levels—power levels from microphone to modulator tube—circuit apparatus—microphone amplifiers—typical speech amplifier—program monitoring, volume indicator, monitoring amplifier, oscilloscope, modulation meter—switching and patching—fundamental modulation methods—Heising and modified Heising modulation systems—100% modulation—over-modulation.

The Tube Transmitter

Fundamental oscillators—plate or grid, Hartley, Colpitts, tuned plate-grid, Meissner tube oscillators—crystal oscillator—X and Y cut crystals—Class A, B and C tube amplifiers—oscillator harmonics utilized—study of master oscillator, buffer, intermediate, modulation and power R. F. stages—tube capacity neutralization—choke coils, grid resistors and condensers—tubes—power supplies.

Typical Transmitters and Antennas

Key and voice signalling—mechanism of voice modulation, keying—practical oscillator circuits—importance of the choke coil—harmonic generator—typical broadcast transmitter and how it is tuned—commercial short wave phone transmitter—bias and blocked plate keying—typical land and marine or shipboard radiotelegraph transmitter—long wave antenna design—short wave antenna design—antenna transmission line design—current feed doublet—directive antennas.

Radio Measurements in Transmitters

Frequencies used in transmission systems—communication and guard band—absorption wavemeters—comparison and beat measuring method—checking and calibrating against standard frequencies—the multivibrator—Radio frequency monitoring—tank circuit meters—radiation meters—radiation resistance measurements—transmission efficiency—modulation measurements—field intensity and harmonic radiation surveys—over-all transmission fidelity—decrement.

The Radiocompass

Radio direction compass as an aid to marine navigation—directive properties of loop antennas—figure-of-eight characteristic—broadside and end-on loop sensitivity—effect of sense antenna, cardioid field pattern—corrections for deviation and antenna effects—antenna compensator—Bellini-Tosi Radiocompass—a typical modern compass installation, loop, direction indicators, receiver, location of apparatus—calibrating a Radiocompass—navigating by means of the Radiocompass—calling procedure.

Commercial Radio Receivers

Types of signals commercial receivers must respond to—IP501 receiver, tuning and detector unit, audio amplifier, loading unit, operation—IP501A, SE1420 receivers—106D receiver, analysis of tuning system, operation—SE143 Navy receiver, fundamental circuit—Western Electric 4D superheterodyne monitor receiver, loop operation, antenna adapter—Coast Guard CGR-1A superheterodyne—amateur short wave receivers—R. C. A. AR 1496 B short wave receiver; circuit and operation—Marconi auto-alarm, receiver and automatic alarm relays.

Typical Broadcast Transmitters

Crystal oscillator—intermediate, buffer and power amplifier—modulation, high and low level—neutralization—tuning—adjustment—operation—complete power supply system and complete circuit analyzed in the R. C. A. 100 watt—R. C. A. 1 kw.—R. C. A. 5 kw. high level modulated—R. C. A. 5 kw. low level modulated—R. C. A. 20 kw. and R. C. A. and W. E. 50 kw. transmitters.

Typical Telegraph Transmitters

Circuit—oscillator—R. F. system—control—keying—operation—adjustment—telephone adaptation—relays—changeover switch for C.W. or I. C. W.—power supplies—auxiliary equipment analyzed in—R. C. A. 3627A 200 watt—General Electric 500 watt code phone—Westinghouse 200 watt code phone—R. C. A. 3628A 200 watt—R. C. A. 3628 500 watt transmitters—emergency transmitters.

Radio Operator with Canadian National Railways



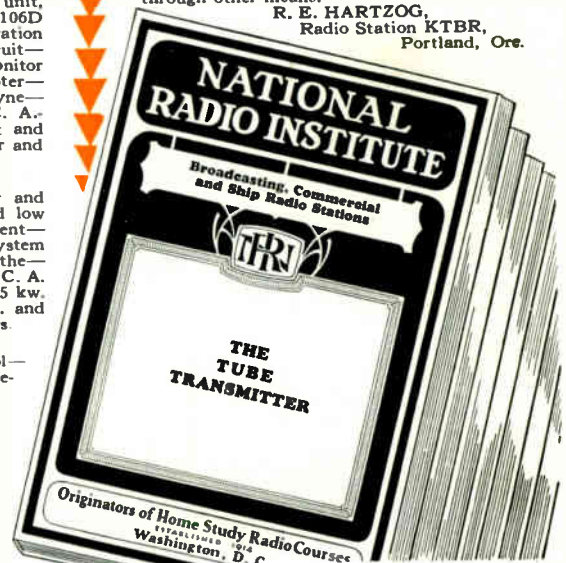
Assistant with the Canadian National Railways in Halifax, where my duties are: Supervisor of Radio Trains, Supervisor of Public Address Systems on Canadian National Steamships and operator of CNRH and the P. A. S. in the Canadian National Railways Hotel here, the 'Nova Scotian'."

L. A. CANNING,
40 Russell St., Halifax, N. S., Canada.

Chief Operator of Station KTBR

"The success that I have made in Radio is directly due to the Course which I took from the National Radio Institute. My opinion is that there isn't any Radio school from which one can get as much real, honest to goodness Radio education as can be obtained from the N. R. I. Having been Chief Operator for four broadcasting stations, including my present job as Chief Operator of Station KTBR, I can safely say that the N. R. I. has prestige. N. R. I. training has enabled me to handle responsibilities better than those who have obtained their education through other means."

R. E. HARTZOG,
Radio Station KTBR,
Portland, Ore.



Specialized Training in

Installing, Operating and Repairing Sound Picture Equipment and Public Address Systems ★ ★ ★



**Inspects
"Talkie"
Equipment
for R. C. A.
Photophone**

"Before I decided on any course, I investigated them all and chose the N. R. I. Believing it to be the most practical and thorough. At the present time I am employed by R. C. A. Photophone Inc., inspecting their Talking Motion Picture equipment installed in theatres. To get and hold such a job a man has to 'know his onions,' and I do thank you and the N. R. I."
S. L. MAHAFFEY,
Electric Theatre,
St. George, Utah

Power Supply for Amplifiers

Power requirements for power and voltage amplifier—rectifier systems for medium and large systems—layout of apparatus—C bias voltage and resistor calculations—power supplies for speaker fields, photocells, exciter lamps, microphones.

Pickup Devices, Speech Input Analysis

Construction, operation, circuit adaptation, electrical characteristics, use in address and picture fields, output level, tube amplifiers required, of carbon, condenser, ribbon and inductor microphones—magnetic pickups—couplers—monitors—line amplifiers and line equalizers—sound levels.

Impedance Matching Networks, Pads and Volume Controls

Source, line, load matching—ideal and practical matching transformers—reflected impedance—selecting matching transformers—tube input transformers—L, T, H fixed and variable pads—constant impedance controls—faders—mixers.

Transmission Lines, Volume Indicators, Monitors

Resistive line, surge resistance, attenuation—terminal impedance for long and short lines—impedance line, surge impedance, attenuation, phase shift—artificial lines—repeaters—line levels and indicators—monitors—low, high, band-pass filters—band elimination filters—equalizers.

Acoustics of Buildings

Reverberation, reflection, echo, resonance—sound level charts—percentage articulation, how affected by loudness, noise, reverberation, space shape—calculation and correction of reverberation period—directional speakers—sound proofing.

Outdoor P. A. Systems

Requirements—essential sections—microphones and their placement—projector, microphone placement—mixer systems—"singing" elimination—outdoor sound projectors—amplifiers—power supply—block analysis of typical systems.

Design of Outdoor P. A. Systems

Outdoor power requirements, service desired, location, power required, equipment needed, block diagram layout—choosing equipment—its connection—projectors—circuit diagram—controls for—typical systems.

Indoor P. A. Systems

Problems peculiar to indoor systems—acoustical treatment—noise ratios—speaker placement—monitors—power requirements—hall, church, portable, auditorium, hotel, school systems analyzed.

Design of Indoor P. A. Systems

General surveys—study of service, location, power required, equipment needed, block diagram layout, choosing equipment, their connection, projector controls for—small auditorium, centralized hotel or apartment house, school systems—portables.

Analysis of Vitaphone, Movie-tone, Photophone Systems

Disc, variable area, variable density sound tracks—standard sound on disc and sound on film recording methods—study of pickup, transmission, amplifier, synchronization and recording apparatus—noiseless recording—standard projection systems and apparatus.

Studio Sound Shooting—Part 1

Sound stage—stage equipment—microphones—monitor room and booth—monitor and amplifier room equipment—volume indicators—monitor amplifiers—relays—power equipment—recording units—acoustic problems—sound sets.

Studio Sound Shooting—Part 2

Close-up, medium, long shots—follow thru and perambulator shots—orchestrations—the play back—sound synchronization—pre-scoring—post-scoring—cartoons—re-recording, dubbing machines—disc and film processes.

Sound Picture Theatre Equipment

Equipment needed, block analysis—sound head—disc pickup—input controls—potentiometer and relay faders—amplifiers—power supplies—speakers—the sound screen—the projector—threading.

Trouble Shooting Sound Motion Picture Equipment

Prevention—battery and motor maintenance and repairs—projector mechanism lubrication—replacing worn out parts—care and maintenance of sound system—routine inspection—trouble chart; cause, indication, remedy.

Control and Operation of S. P. and P. A. Systems

Routine operations—general instructions for starting sound apparatus—starting a Western Electric and Photophone system—procedure for setting up film and disc reproductions—fader, gain, quality controls—monitors—rehearsals—running show—show breakdown—starting P. A. systems.

Talking Movies were made possible due to Radio inventions. Thousands of theatres are equipped with Talking Movie equipment. In addition to the jobs opening in theatres from time to time there are also many in connection with making news, comical and feature films. Manufacturing, installing and servicing "Talkie" equipment offer other opportunities. Public Address Systems are also covered by this Course.

Specialized Training that fits You for Radio Opportunities in Aviation



Radio is making flying safer. Airports are being Radio equipped, many planes now carry Radio apparatus so that the pilot can get directions from the ground regarding weather conditions ahead. Many men and young men who do not have the money to take up flying or who want to get into this industry but do not necessarily want to get in the air, will find that this Course offers them a chance to get a good start and make good pay in a rapidly growing industry. Uncle Sam also employs a large number of operators.

The Application of Radio to Aircraft

Fields of use, beacon, blind flying, weather reports, transport dispatching, emergency, blind landing—duties and responsibility of Radio men—analysis of a transport plane—flying; air and ground speed, plotting air course, flying airways—communication procedure—the teletypewriter system—airport ratings.

Airplane Radio Equipment

Equipment required for beacon and weather report reception for two-way company communication—transmitting and receiving antennas and their efficiency—power supply—shielding, ignition harness, testing completeness of shielding—bonding, methods used, tests—location of apparatus and antennas.

Aircraft Radio Power Supplies

Classification of supply apparatus—power required by the receiver and transmitter—engine driven, vibrator voltage regulator—Eclipse engine driven generator—constant speed engine driven generator—Deslauriers wind driven generator—dynamotor—A. C. generator with rectifier—storage batteries—typical supply system analyzed.

Aircraft Radio Transmitter Circuits

Frequencies used—self-excited transmitter—Meissner, tuned grid, tuned plate, Hartley, Colpitta, T.G.T.P.—separately excited master oscillator—amplifier—Piezo electric master oscillator—voice modulation, high and low level—harmonic generator—feedback neutralization—typical telegraph and telephone circuits.

Aircraft Radiotelephone Transmitters

Airways transmitter General Electric RT-39A, components, power supply, rating, signalling, frequency range, antenna, tubes, basic circuit analysis, operation—Western Electric 11-A itinerant flyer's transmitter, size, weight, circuit analysis, power supply—Western Electric 10-A airport transmitter, frequency, power supply, circuit analysis, installation and operation.

Aircraft Radiotelephone and Radiotelegraph Transmitters

Transmitters for two-way company use—W. E. type 8-A phone transmitter, power unit, crystal

oscillator, doubler, modulator, A.F. amplifier, antenna system, microphones and phones, two-way operation—complete power supply circuit, control apparatus analysis for W.E. 9-A ground phone—Westinghouse 20 watt and R.C.A. ET3666 transmitters.

Fundamental Aircraft Receiver Circuits

Short wave, aural, visual and weather report receivers—short wave radiation analyzed—required sensitivity, selectivity, fidelity, frequency cut-off—special requirements for simultaneous visual beacon-phone reception—fundamental aural beacon, simultaneous visual beacon—phone, short wave receivers—theory of automatic volume controls and phone-beacon signal filters—choosing receivers.

Aircraft Radio Receivers, Part 1

Detailed study of frequency range, size, weight, receiver unit, remote controls, cables, plugs, mounting, performance, circuit, phones, power supply, installation and operation of W. E. 9-D beacon—W.E. 9-B short wave—Stromberg-Carlson model D long and short wave—Marconi AD-20 short wave receivers—combination beacon, short wave and transmitter installation.

Aircraft Receivers, Part 2. Police Radio

Layout, receiving unit, weight, size, controls, tubes, circuits, cable and plug analysis of R.C.A. AR-1286 beacon—R.C.A. AR-1308 short wave—R.C.A. type A all-wave—National SW3 aircraft receivers—aircraft-police Radio apparatus comparison—general features—Stromberg-Carlson, a typical police Radio receiver—antenna installation—interference elimination.

Radio Aids to Navigation

Five major requirements in Radio aids—loop antenna theory, figure eight and cardioid field patterns—airplane direction finder, fixed loop, sense determination, Radiocompass—ground Radiocompass, triangulation—rotating beacon, characteristic signal plus time interval—Radio range beacon, aural and visual systems, homing feature, sound drift elimination, zero signal.

The Aural Radio Range Beacon

Field pattern for four course aural beacon—need for bending course—typical aural beacon

transmitter, master oscillator, intermediate amplifier, cross neutralization, power amplifier, goniometer, cam signal and interlocking signal—aligning the course—loop tuning—stray coupling—relays—effect of antenna on course bending—operation notes.

The Visual Radio Range Beacon

Advantages of visual beacon—reed indicator—reed frequencies—double modulation—2 and 4 way course, field pattern—carrier suppression—modulation signal generators—12 course triple modulation beacon, complete transmitter circuit analysis—simultaneous phone-visual beacon, circuit analysis—course alignment—reed converter—deviometer.

Radio Aids to Blind Flying

Instrument flying, devices used, proper panel lay-out—blind landing, homing agent, field localization, glide path—induction field cable system—sonic, capacity and reflection altimeters—blind landing by means of a Radiobeacon; homing beacon—runway localizer—marker beacon—landing beacon.

Aircraft Radio Communication Systems

Interconnection of government facilities, teletypewriter—Army, Navy, Department of Commerce aircraft facilities—transport company communication, Aeronautical Radio, Inc.—dispatching plane—terminal clearance—position logging and reports—means of communication—aircraft radiograms—tracing a plane from take-off to destination—aircraft Radio laws and regulations.

Maintenance and Repairs

Systematic maintenance—care of bonding and shielding, power supplies, receivers—general repair of receivers—running down internal noise—set analyzer and signal generator tests—transmitter maintenance and repairs—voltage power and insulation tests—reinstallation.

Reference Texts

Flight Principles
Aircraft Instruments
Aerology and Meteorology
Aircraft Traffic Rules



Short Wave Radio Set aboard U. S. Army Air Corps Transport "Ford C-9."

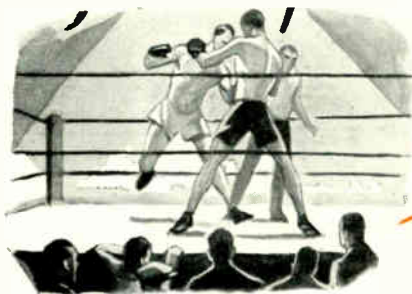


Broadcasting from a plane. The progress made adapting Radio to flying is demonstrated here.



The Radio Operator in this plane is stationed near the pilot.

Specialized Training in TELEVISION



ADVANCED
NO. 5
COURSE

This Course is designed to give you the fundamental principles of this coming field of wonderful opportunity. While Television has not been developed to the point where it is used for practical purposes, a great number of prominent engineers are experimenting with it and it is only a matter of time until our homes will be equipped with Television receiving sets. Those who want to experiment will find instructions in this course for building a Television receiver. When practical Television is developed, it will mean the making over of the entire Radio industry and naturally the man who gets his knowledge of the subject now is going to have a big advantage over

the man who waits until home receiving sets are sold on a large scale because many of the good jobs will have been grabbed up by someone else by that time.

Essentials of Television, Part 1

Communication, sound and sight comparison—definitions—six basic steps in visual communication—analysis of steps—scanning the picture—picture elements—persistence of vision—direct and flying-spot scanning—pinhole and lens Nipkow disc—film scanning—electronic systems of scanning.

Essentials of Television, Part 2

Resolution of a picture into maximum and minimum frequencies of transmission—formula—picture detail and picture frequency analysis—the photocell and its amplifier—positive and negative pictures—new glow lamp—crater lamp—cathode ray tube—Karolus cell.

Optics

Light—light waves—commercial light sources—light projection—reflection—refraction—light intensity, candle power—illumination, lumens—color—velocity of light—wavelength, the Angstrom—electromagnetic waves—eye response.

Geometric Optics

Plane, spherical, elliptic, parabolic mirrors—concave, convex mirrors—Snell's law—prism—total reflection—lenses, six types, geometric analysis, focal, object and image distances—principal axis—optical center—real and virtual images—lens position and magnification formula—polarized light.

Applied Optics

The camera—aberration in lenses—rectilinear lens—lens speed—magnifying glass—telephoto lens—motion picture projector—sound picture recording and projection optical systems—television optical systems—lens discs—direct and flying-spot scanning—Kerr cell—collimator disc—film scanner—Weiller wheels.

Television Quality Requirements

Standards—field of view—resolving power of the eye—relation between viewing distance, picture size and number of scanning lines—picture repetition—image color—broadcasting channel—advantages in action and projected pictures—photocell color response—frequency distortion—photocells—scanning aperture, correction.

Synchronization and Framing

Synchronism—isochronism—framing—allowable deviation—practical standards—synchronizing methods, electrical and mechanical, manual, synchronous motors on same power line, motor regulation, independent stable oscillators, picture signal component—phonic motors—tuned low frequency amplifiers—framing and synchronization troubles, remedies.

Telephotography—Facsimile Transmission

Coded systems, Korn, Bartlane methods—modulated systems, Belin, Jenkins, phono-photo methods—dot-dash systems, telepix, Ranger methods—R. C. A.—Ranger transmitter and receiver—transatlantic transmission.

Mechanical Television Systems

Telehor, Baird (England), Telefunken, Jenkins, Sanabria, Alexanderson, Bell Laboratories, H. M. V. (England), and Bell Laboratory multiple channel systems—pinhole, lens Nipkow scanners—mirror wheels—crater lamps—lamp-selector

switch time lag—multi-channel—colored picture systems.

Electronic Television Systems

Cathode ray tube, principle and operation—electron stream—deflection systems—saw tooth neon lamp oscillators—Zworykin film transmission system, electronic pickup scanner—adapting cathode ray Radiovisor—Farnsworth, director and oscillator tubes, high frequency amplifier—Von Ardenne system.

Television Studios and Transmitters

Studio technique and procedure—multiple photocells—photocell and studio equipment—studio control and personnel—film subjects—outdoor pickup—television transmitter—typical circuit, analysis, design problems—transmitter location—ghost images—fading.

How to Build Radiovisors

Scanning disc, square or round holes, layout, hand and machine construction—drum and drum shutter design—variable friction drive—phonic motor, tuned amplifier—building a lens disc—building single and double Weiller wheels—narrow aperture optical system—Kerr cell construction—framing devices—making television camera.

How to Build Radiovision Receivers—P. 1

Selectivity, fidelity, sensitivity standards—matching amplifier to glow lamp—parallel output tubes—determination of picture amplifier stages—phase shifting connections—designing the resistance coupled stages—motorboating suppression—frequency equalizers—choosing the detector—construction details—designing detector R. F. filters.

How to Build Radiovision Receivers—P. 2

Importance of R. F. system—band selector and transformer circuits—band width—carrier frequency analysis—value of regeneration—antenna coupler—designing the Television receiver, constructional details—power supply, tuned amplifier construction—cathode ray tube adaptation—tube shielding—beam centralizing, deflection oscillators—commercial receivers, construction details—quasi-optic wave receivers, simple detector and super-regenerator receiver.



Jenkins Television Transmitter



Courtesy Jenkins Television Corp.
Pianist and singer before the Photo-Electric Cells of Television Station W2XCR and broadcasting sound station WGBS

A SPECIAL COURSE *in sending and receiving* *code for those who want a* **GOVERNMENT LICENSE**

This special training is designed to teach you to send and receive messages in the dot and dash alphabet of the Radio Code. It is not a part of my Certified Radio-Trician's Course or any one of my Five Advanced Courses. It should be taken by all those who expect to go into Broadcasting, Commercial, Ship Radio Stations and Aviation Radio work. While there are some jobs in Broadcasting Stations that do not require a First or Second Class Commercial License, I am inclined to feel that if you expect to go into broadcasting work it is better for you to take code training also because of the better opportunities for which you will be fitted.

The Government license is issued by the Department of Commerce through the Radio Supervisors of the different districts into which the United States is divided. When you are ready to take your examination for a Government license, I shall be glad to give you the name and address of your nearest Radio supervisor if you do not already have it. He will tell you when you can take the examination in your city or in a city near you. There is a small extra charge for this Special Code Training as explained on the enclosed enrollment blank. If you are not quite sure whether or not you want one of the positions requiring a Government license, then I suggest that you send in your enrollment for the Certified Radio-Trician's Course. When you get to the 15th lesson, I shall ask you to decide which of the Advanced Courses you would like to have. If you choose Advanced Course No. 2 or No. 4, I suggest that you take this Special Code Training also. It will not be necessary however for you to choose or begin your code training until you finish your Certified Radio-Trician's and Advanced Course.

This Code Course is not sold separately unless you have already taken my Certified Radio-Trician's Course, because a knowledge of sending and receiving code alone is valueless unless you know Radio thoroughly the way my Course gives it to you.

The special code lessons mentioned below as well as all the instruments pictured on this page are included in the tuition fee mentioned on the enrollment blank.

Learning to send and receive the code is almost entirely a matter of practice. N. R. I. students usually learn quickly because of our clear methods of teaching and wonderfully helpful instruments. The lessons give special exercises designed to teach the subject scientifically so that you can make good progress. Men who already know the telegraph (Morse) code will find it enables them to learn the Radio code in an unbelievably short time when properly taught, without confusing the two.

Special Lessons given with this Code Course

The Alphabet—International Morse code—Translation from code to English—From English to code—Spacing and length of signals—Correct operation of key—Adjustments—Punctuation marks—Learning numerals—Sending code with Learner's Transmitter.

Steps in Learning the Code—Practice exercises in sending—Gaining Speed—Abbreviations—Use of call letters—Method of calling—Distress Signals—Commercial Messages.

Copying Code Messages—Use of Nacometer—Signals—Time signals—Weather reports—Warning messages—Log sheets.

THE PERFECT CODE TEACHER



The Nacometer and the Audio Oscillator pictured above are sent to you with our Code Course. They suit your needs whether you are a beginner or an amateur needing more speed to get a Government license.

Let me describe the Nacometer briefly. You can regulate it to send to you at the rate of four or five words a minute on up to forty words a minute. It has many patented features that make it the ideal machine for the purpose of learning to receive and send code. The tape has two rows of perforated messages. When one side has been sent the full roll will be sent you again from the opposite side without rewinding.

The waxed tape is very strong and will last indefinitely with ordinary care. Each tape contains approximately four hundred letters or characters. A large percentage of the messages are cipher so that you will find it difficult to memorize a tape to such an extent that you can anticipate the messages. There are two rows of code messages on each tape. Three rolls of tape are given with every Nacometer. It is a complete unit. Everything is enclosed in a handsome cabinet with handle attached for convenience in carrying. The crank can be easily removed and put inside. You can put the batteries in the cabinet or hook them up on the outside. It is as simple to operate as a phonograph. Equipped with a silent motor there is no noise to bother you, no clicking or choppiness. You use headphone and tube included with the Equipment shown on pages 32 and 33.

Features of the Audio Oscillator

The Audio Oscillator has many advantages over the ordinary key and buzzer. The tone is constant. It does not need constant adjusting. The signals are clear, pure and exactly like that of a Commercial Code Station, and its pitch may be varied. It is adapted for high speed sending. It sounds just like the instrument used for giving commercial code examinations. It may be operated with any four prong receiving tube (UX201A, UX112A, UX199, UX230). It is compact, portable. It may be used independently of the Nacometer for learning to send.

I send you the Nacometer and the parts as well as a diagram necessary for building the Audio Oscillator by express collect. It is very easy to assemble and gives you good experience. This method of learning to send and receive the code at home has been given considerable praise. You will find it far superior to makeshift methods.

These Successful Radio Men advise you to get into Radio also

J. Matheson Bell

A self-made man in the true sense of that word. Started with only a fourth grade education and worked up from laborer to Merchandise Manager of Montgomery Ward. Made a big success in a unique business of his own—selling Radio sets through agents instead of stores. Knows men, knows how to run a business, knows opportunities.



OZARKA

LONG DISTANCE TRAINING IN EXPERIMENTAL RADIO

CHICAGO

April 23, 1932

Mr. J. E. Smith, President,
National Radio Institute,
16th & "U" Streets, N. W.
Washington, D. C.

Dear Mr. Smith:

Your organization and the work it is doing has been under my close observation for about six years.

During that time I have had an opportunity to notice what your training is doing for the ambitious fellows who enroll for it.

THIS is particularly true as regards my own organization. A large number of my most successful men are N.R.I. graduates. Results are always the best proof and endorsements.

This proves that the man thoroughly trained in Radio fundamentals, set servicing and various branches of Radio operating, has a decided advantage. The trained man knows how to operate his work, can handle more jobs in less time, can win and keep the confidence of set buyers and prospectively set buyers much more easily than the untrained man. His earnings are larger because he knows more. He is trained to see more opportunities to make money which others overlook.

I have enjoyed seeing your organization progress, your Course improved and enlarged from year to year and I can unhesitatingly say that the man who knows and masters it should receive in return many times his original investment in a very short period of time. You are doing excellent work for ambitious men and young men and for the Radio industry.

I have also noticed that quite a number of men and young men have hesitated about entering the Radio industry because they feel the best opportunities are used up—that it may have reached the full extent of its possible growth. My own feeling and observation is that while Radio has grown tremendously, little more has been done than scratch its possibilities. Television will be with us soon. The field of automobile Radio has hardly been scratched. Still a very large percentage of our homes do not have Radio sets. Many sets now in use are obsolete. The Radio field is in a position to absorb hundreds of additional well trained Radio men.

If I were a young man, or even in middle age, looking for a field where I felt my efforts would receive the largest rewards, I would

OZARKA

certainly turn to Radio. In fact, Mr. Smith, if I did not feel this way, I would not be in the Radio business.

I have no hesitancy in recommending Radio as the field to choose for one's life work, and in recommending the National Radio Institute for thorough, practical Radio training for the purpose of getting a start and a foothold in this industry.

Sincerely,
J. Matheson Bell
President

JMB:



McMurdo Silver

Well known Radio engineer and manufacturer of Silver-Marshall Radio sets and sound equipment. Pioneer manufacturer of Super-heterodyne receivers, designer of several other well known circuits. Member of the Institute of Radio Engineers and the American Institute of Electrical Engineers.

AUSTIN C. LESCARBOURA
AND STAFF

WORDSHOP, CECOTON ON HUDSON NEW YORK
17 WEST 42ND STREET NEW YORK CITY

June 13th, 1932.

Mr. J. E. Smith, President,
National Radio Institute,
Washington, D.C.

Dear Mr. Smith:

I deem it a pleasure as well as a privilege to recommend your Radio Institute in a world that has all too many untrained men.

My experience with you is that I have always had the pleasure to observe and without exception to have seen in the progress of many of your students. I must admit that after a thorough review of your course, I am convinced that the sincere student can master the theory and practice of Radio at home and in his leisure moments.

I am particularly impressed with your advanced courses, which serve to raise not only the novice but also the old-time student to a much higher standard of proficiency, for the latter saving job in radio.

THE WORDSHOP
A LITERARY FOUNDED
DEVOTED TO THE
HOULDING OF
PUBLIC OPINION

On your excellent staff, Mr. Smith, are I am convinced that your efforts are being fully rewarded. I am sure that the training, available and under your supervision, will further Radio progress with undiminished speed.

Austin C. Lescarbourea

Former Editor of Popular Science Monthly and former Managing Editor of Scientific American. Now Public Relations Counsel for many of the leading Radio companies. Member of the Institute of Electrical Engineers and Institute of Radio Engineers. Author of popular Radio books.



SILVER-MARSHALL, Incorporated

SM

RADIO EQUIPMENT
6401-6451 WEST 65TH ST.
Chicago, U.S.A.

June 13, 1932

Mr. J. E. Smith, President,
National Radio Institute,
Washington, D.C.

Dear Mr. Smith:

Your question as to my opinion of the future for a young man who takes up Radio training can have only one answer.

I should say that such a future should be especially bright. Radio is the logical choice for any young man interested in obtaining access to an industry which is continually expanding and one in which the concerns therein engaged are constantly striving forward, rather than remaining in a more or less fixed position.

This field holds a lure for the individual with an independent and far-reaching mind, because it is one of continual new developments and because every development perfected, far from being the close of an incident, gives promise to far greater developments to come. Therefore, new opportunities are daily being presented to young men trained so that they may take advantage of them.

Needless to say, Radio is no longer a profession for untrained or inadequately trained men. The need now is for men with real technical and engineering knowledge. The policy of training, as well as theory, is one which indicates a keen insight into the requirements of such a course.

With best wishes for the continued success of your really constructive work, I am

Cordially,

McMurdo Silver
McMurdo Silver

Radio's many **\$5,000 \$10,000 and \$15,000**
a year men of the future
Will be picked from
those who get in *Now*

Let's look back a few years—perhaps it will help us to see what is ahead for you in Radio. Let us compare what has taken place in other industries such as motion pictures and the automobile business.

Almost without exception, the men who got into those fields at the right time, now occupy the key positions. They are the \$5,000, \$10,000 and \$15,000 a year men. Why? Because by getting in early they were in line when opportunities for promotion came. Because they grew in position and responsibility with those businesses.

Most of the good opportunities are now used up in those older fields. The chances your father and grandfather had in those businesses are gone. But they are being duplicated for you now, right before your eyes, in Radio. Do you have the vision, the foresight, to realize this?

All of us must keep in mind that this old world of ours does not stand still—it goes forward. So it is with businesses. When the first high wheeled, two cylinder automobile made its appearance and dashed through the city streets at the tremendous speed of 20 miles an hour, the great majority of people thought men with such an idea were "cracked". Only a few looked ahead and saw that the automobile offered a faster and more comfortable means of transportation. That it would develop into a big business. Those few with that foresight who got into the business, had the first chance at the good jobs. When the first crude outfit of coils and crystal made its appearance it was generally thought by the average person to be a play-



"Another raise! John, I'm proud of you. Specialized knowledge of the right field certainly brings quick returns."

thing for young boys to occupy their time and energy. Very few thought of it as the beginning of a faster means of communication. Those who poked fun at it—who turned their backs and laughed—did not stop to think that Radio, like the automobile, would be improved, perfected, that its uses would be expanded and developed. The men who had faith in its future, who hooked up with the field, had the first chance at the good jobs and you will find almost without exception that the key men in Radio today are those who got in early.

**You'll be kicking yourself
 if you pass up this
 opportunity**

It has often been said and written that the saddest words are—"If I had only". You've heard your neighbors, perhaps your parents, say: "If I had only gotten into the automobile business or the motion picture field when they started—if I had only had the courage and foresight to do it—I would now be independent, perhaps rich."

Isn't that what you are going to be saying a few years from now if you pass up the opportunities in Radio? Don't think for one minute that Radio has reached the limit of its growth and opportunity. The biggest men in the business, the best engineers, predict tremendous future growth. This growth is going to open hundreds of fine jobs—it has already opened thousands of fine jobs. Who will get the new jobs? The men who get in now—who get a thorough foundation on which to build for the future. The \$5,000, \$10,000 and \$15,000 a year jobs of the future that are being made by Radio's growth, are going to those who get in now, and grow up with its growth.

Do you have the ambition to realize this? Do you have the courage to act on your own conclusions? If you have, then you have two of the most essential qualifications for success. You will lose no time getting your Radio training started.



I predict

That the Radio industry will quickly expand and grow to many times its present size.

That before very many years Radio will rank among the very largest of American businesses.

That its use for home entertainment, which today is quite universal, will expand and grow even beyond any prophesies I may try to make.

That in a short time Television will be perfected, which should result in the making of the entire Radio business over again and with its inauguration bring hundreds of new and fine jobs.

That Radio's use for communication purposes between cities will become almost as common as telegraphy is today.

That in a short time we will be able to pick up our telephone receiver and talk to our friends in airplanes, on board ship, just as we now can talk with our friends across the ocean by means of Radio Telephony.

That the number of jobs made to date by Radio's growth and expansion is but a fraction of the number that Radio's future growth will make.

That the man who associates himself with this field now and sticks with it, is going to have innumerable opportunities for jobs that should not only enable him to enjoy a comfortable living but lay aside enough to be financially independent.

That the man who takes my advice to get into Radio now will never regret doing it—but thank me later for urging him to open his eyes to the golden opportunities and the rich rewards that Radio offers.

That you will never have another opportunity for success equal to what Radio offers you now.

J. E. SMITH, President.



Made \$1500 to \$2000 in spare time while taking course

"Anyone wishing to enter the Radio profession will find the courses offered by the National Radio Institute the very foundation of their success. Working only in spare time I made between \$1500 and \$2000 while taking the course. I give the N. R. I. credit for starting me in the right direction in this line of work."

CLEO T. RETTER,
30 W. Beechwood Ave.,
Dayton, Ohio



Clear, practical, interesting, brought him \$935 in spare time

"I feel it my duty to express my appreciation for the splendid training you have given me. While I maintain quite a large automobile repair shop, I decided to study Radio, as the field looked promising. I found your course clear, practical, interesting.

Since beginning I have added considerably to my income, even though my business occupies most of my attention. I began earning money quite soon after my first lessons had been finished and in a few short months my profits totaled \$935.80, for installation work, servicing, trouble hunting—on all sorts of sets.

The results of my training with you have been most gratifying—a constantly increasing and profitable business, and the satisfaction of feeling that I am not balked by any Radio problem which may present itself. I will be glad to recommend your course to anyone interested in studying Radio."

GEORGE W. PAGE,
110 Raleigh Apts.,
Nashville, Tenn.



Earnings began after 1 month

"I did not know anything at all about Radio before enrolling with the N. R. I., but I had only been a member about a month when I started cashing in on spare time Radio work. Before I had half finished the course I received the position as Radio Engineer with Thomas A. Edison Laboratories, due solely to N. R. I. training. I stayed with the Edison Company until they discontinued the manufacturing of Radios. I am now in the Radio Repairing and Servicing business for myself and have been very successful. I have a good income and one of the best equipped Radio Repair Shops in the Southwest. I give N. R. I. the credit for this success."

J. W. SESSUMS,
1805 Greenville Ave.,
Dallas, Texas

These Letters *answer your question* How Soon can I start making *More Money?*

With my training to help you, you should start making more money almost at once.

I give you tried and tested plans and ideas for doing it. I begin to give you special training on jobs most common in every neighborhood the very day you enroll for the express purpose of enabling you to begin "cashing in" quickly.

The letters on this page prove the practical value of my plan. Read them. Read every word of all of them. I have hundreds of testimonials on file. The variety of letters I show you in this book is surely convincing proof that you too have an opportunity in Radio no matter what you may be doing now.

It is a mighty fine feeling to know that you have at your finger tips, knowledge of subjects which you can put to use quickly right in your own neighborhood, most any time you want to make some extra money. And the work is interesting. It is fascinating. Making a balky set produce good clear tones, pick up stations from long distances, is work that is appealing, satisfying.

If my Course could do nothing more for you than to help you to make good money in spare time, you would more than get your money's worth. But remember, while you are getting this training—training that teaches you to do spare time jobs, you are also getting a training for full time jobs in the Radio industry.

Many men and young men take this course who have no intention of entering the Radio field—only for the sake of the extra spare time earnings it brings them. It helps them pay expenses going through school, pays their doctor bills, buys many things that add so much to happiness that the average salary cannot cover.

Who wouldn't pay the small price of my course for a training that is bringing back \$200 and sometimes more than \$1000 a year when used only in spare time? Who wouldn't make that investment, realizing that spare time returns are only a small part of the total benefit to be received?



Earnings started after one month

"When I enrolled with the N. R. I. I did not imagine that the course would be so beneficial. I was very much surprised at the simplicity of the lessons. They were so interesting I could not let go of them. After one month as a student I started earning money. I earned \$750 in my spare time while taking the course and I did not have to hustle to do it. Since graduating I have earned \$1700 more—still in my spare time. I have turned down many good Radio positions. To any one interested in Radio I will say—if you want to advance yourself enroll with the N. R. I. I know they will stand behind their statements."

F. J. MARGRAF,
Box 91,
West Point, Ky.



Earnings started after 6th lesson

"After my sixth lesson I was earning lots of money on the side repairing Radios and I continued to make a few dollars every minute of my spare time. Altogether, I earned around \$800 to \$1,000. Very soon I was able to leave the farm and take up a responsible position in the city in which I now live. I am now a graduate of the N. R. I. and proud of it. I heartily recommend your fine Radio course to anyone who would like to take up Radio as a profession. They will find the lessons easy and almost a pleasure to learn."

A. MARTIN,
6 Angus Crescent,
Regina, Sask., Canada



Lands responsible position before graduating

"The work I get through the training N. R. I. has given me keeps me so busy that I have to *take* time to do anything else. If I should stop my course right where I am, I feel that I have learned enough to pay for it many times. Some weeks I make as high as \$25 in a few hours spare time, and within a month after I enrolled, I made enough in one evening through the sale of a set, to pay for the whole course. Altogether, I have earned at least \$1,500 and am just starting my 33rd lesson. If it had not been for my N. R. I. training, I could never have had the job I have now—that is, building 5KW oscillating tubes and transmitting tubes and 'tuning' the high frequency bombardiers that they use in our plant—the Cardon Corporation, now combined with the Sparton organization. Last year our shop was nearly all laid off. There were only 8 working out of over 2,000, and I was one of the eight—men around me with much more expensive training were let out. Many of them are still off. I want to say that you have been with me 100%, and your school has certainly done a lot for me."

LYNN HENDERSON,
600 N. Pleasant St.
Jackson, Mich.

My Course Helps the *Experienced* man as well as the *Beginner*

Men who are in Radio or who have done Radio work ask: "Will your Course benefit me also?" My answer to that question is, "yes". Scores of my students have been college graduates, electrical engineers, trained engineers for other fields. Radio dealers, licensed amateurs, "fans", Radio operators in the Army and Navy—men of all these various positions have been able to increase their earnings in Radio through my training. Service men too report excellent benefits.

Men with years of Radio experience find my Course brings their knowledge up-to-date

The Radio art is changing so fast that the man who expects to keep abreast of the developments must have a firm basic knowledge of the fundamentals. The amount of basic education required has increased. Men who took any form of Radio education several years ago, in many cases, find that they no longer understand modern Radio theory. A lot of valuable information is appearing in periodicals but the number of Radio men who understand it, is few. The N. R. I. Course prepares you to get all the valuable information that appears in publications.

Every lesson has been written by a practical Radio specialist and revised by our Instruction Staff so that it may be learned quickly. N. R. I. training is not dry or abstract, but specific. That is, practical problems, circuits and apparatus are given to illustrate fundamental theory. The Course is not only for the beginner, but for the "dyed in the wool" Radio man. Many an expert has taken the N. R. I. Course to find that it cleared up difficult problems for him. Even if you expect to go to college to learn more about Radio, this Course will give you a foundation that will make whatever you learn afterwards more valuable. In spite of its simplicity, many trained engineers and college graduates have found this Course gave them an insight into Radio that no amount of book study could give them. Reading diagrams, characteristic curves of tubes and circuits are a few of the many subjects you will master. The ability to solve daily problems by simple calculations is another part of this valuable training.

If you have occasion to build any form of Radio apparatus, you will be taught how to coordinate the required parts in a very efficient manner. You will learn how to improve on existing designs and how to operate any Radio device at its greatest efficiency. For example, many operators in the Army, Navy and Civilian Services have found that knowing how and why the apparatus they maintain works, has enabled them to get the greatest efficiency and most reliable performance out of it.

Many a service man who learned to service Radios in a blind and guess manner, has found that a sound knowledge of modern Radio has helped him to service more intelligently and more quickly, thereby earning more without working longer hours.

Owners of a Radio business or service, even though they are not called on to do technical work, have found that they have improved their business or service by knowing what is in this course. It is an axiom that a successful business is based on knowing all about what you are selling.

The best jobs in Radio—the jobs at or near the top—are closed to the man who has only the incomplete knowledge which can be gained without thorough study. Often such a man knows a good deal of the "how" but not enough of the "why". You may be one of the many thousands of men engaged in this Radio field. If so, the fact that you are reading this book shows you realize that your chance for promotion and a permanent future depends on learning this subject inside and out.

Course of great value to experienced Radio Man. Installs and operates Police Radio System



141 Kirkwood Ext.,
Akron, Ohio

Dear Mr. Smith:

I tinkered with Radio as a hobby from 1911 to 1920 so I did not start with your school as a rank beginner. After seven years as a commercial operator, I saw the need for more details and advanced training. I took up your course, because I figured it would lay out the work, starting with the simple and proceeding to the more complex in logical sequence, and it did just that. Since completing your course I have worked as Radio operator for the Firestone Tire and Rubber Company on their short wave circuit to Liberia, West Africa. I completely redesigned and rebuilt a broadcast station in North Dakota, leaving there to come to Akron, Ohio to supervise the installation of the Police Radio Alarm System. At present I am acting as Chief Operator of the System.

The background in theory and practice obtained from your course has been of inestimable value to me on many occasions, and I take this opportunity of expressing my thanks for all the courtesies shown me during my work with the lessons and in the years that have followed.

Very truly yours,
NORMAN R. HOOD



Experienced Radio Man explains why he took the N. R. I. Course

40 S. 22nd St.,
Newark, Ohio

Dear Mr. Smith:

At an early date I realized that Radio had a promising future. Six years ago, I started working full time on Radio service in my present location, and our business has been increasing beyond my expectations. I have made more than \$12,500 in Radio work to date and expect to do better each year. I have the best Radio service position in this city—the position which I had before taking your Course, so for the benefit of others I will explain that I spent the money necessary for N. R. I. training for the following reasons:

To get an up to the minute set of reference books.

To get a review of all Radio principles and circuits.

To get in contact with an excellent employment service.

To obtain very valuable consultation service.

To obtain more prestige by having an N. R. I. Diploma.

To show me all the opportunities in Radio and help me to decide in which branch to specialize.

The promise to keep me informed on future developments in the rapidly expanding Radio industry.

The N. R. I. course was much better than I expected and I can highly recommend it to one who is interested in any branch of Radio. Your Consultation and Employment Services are fine and worth many times the price of the complete course.

Yours very truly,
CHARLES W. BELT

My **50-50 Method** of training you at home in your spare time gives you many advantages

Not so many years ago the only way open to the man or young man who wanted to fit himself for a business or profession was to pack his trunk and go to college, or to a residence trade or business school. This meant giving up his job—his source of income—and being under heavy expense while attending school—tuition fee, room, board and other expenses amounting to a handsome figure—in most cases enough to take just about the last dollar that had been saved from years of hard work, or as a result of careful planning and self denial. The amount of money needed for even a short course placed specialized training beyond the reach of most men and young men who needed it the most.

It is inexpensive

Then came the correspondence course—teaching by means of printed instructions what was regularly given in the classrooms. This method immediately eliminated the heaviest items of expense in getting an education—namely, room, board and other living expenses. It opened the chance to get ahead to the young man whose parents were unable to send him to high school or college. It meant that the man who for family or other reasons could not leave home had a way opened to him to study and win advancement. It meant the man or young man whose regular work kept him busy with only an hour or half-hour a day to spare could fit himself for a new line that would bring better hours and more pay. Men in every walk of life, rich and poor, young and old alike, have benefited from home study training.

You needn't give up your job

You needn't cut off your source of income to take this course as would be necessary if you attended a residence school. Study when it is most convenient, when you feel like it. Fifteen to thirty minutes a day will enable you to make good headway. Keep your present job until you are ready to step out—until you have another lined up.

You are in a class by yourself

Unlike residence training, you don't have to hustle and cram to keep up with the rest of the class—and you won't be held back because of some backward student. You set your own pace.

It is practical

Hundreds of men owe their success to correspondence training. Without it they would not have been able to get ahead. They would not have had the time or the opportunity to study. The many letters from students and graduates in this catalog prove the practical money-making value of N. R. I. training.

It is recognized

Employers prefer men who have the character, the steadfast purpose, the determination to tackle a job and finish it. Correspondence training develops those characteristics. The best minds recognize the value of home study training. Many of today's business leaders are themselves correspondence school graduates.

It is fascinating

My training is not a long series of dry text matter. With it you get Radio parts for practical experiments. You work out with your own hands what you learn in the Lesson Texts. This 50-50 method of training is unequalled. It sends you out a trained experienced man all ready for a good job—not simply looking for a job in order to get experience.



The student of today is the executive of tomorrow. The man who learns more, earns more.



Peak of perfection

"I think the N. R. I. course is the peak of perfection and my statement should carry some weight as I have taken other courses. I have gained more knowledge from the N. R. I. in one year than I could have gotten by tinkering for five years, with much less grief and expense. When you can service Radios of every description, without a hitch, without consultation, without assistance and time after time have your customers say, 'It seems queer but after you serviced my Radio it worked better than when it was new', then you begin to fully realize the results of N. R. I. training. No matter what place in the Radio field you select, you will benefit beyond the measure of dollars and cents by taking the N. R. I. course."

OSCAR PRESCOTT,
Vinton, Iowa

The only education worth while is self-education. Show me a man or executive who, in addition to applying himself wholeheartedly to his work, is using his spare time in improving his education, and I will have no hesitancy in saying—There is a man who will make good and go far.

Charles M. Schwab

The work done by correspondence is even better than that done in the classroom. The correspondence student does all the work himself; in fact, he does twenty times as much reciting as he would in a class where there are twenty people. He works out his own problems, and the results stay with him.

Wm. Rainey Harper,
(Late President of the University of Chicago)

Instruction by correspondence is the cheapest and best.

Edison

Correspondence training is the greatest development of the 20th Century. It is doing and will do more to improve and uplift our present-day civilization than any other invention or development we have made.

Theodore Roosevelt

FINAL PROOF

that My Course gives You the *Training* you need *for a good job and a Real Future* in Radio



Broadcast Engineer has varied career

Radio Station WKZO,
Kalamazoo, Michigan

Dear Mr. Smith:

It is a pleasure for me to tell you about my activities since I graduated from the National Radio Institute. In the fall of 1923 and spring of 1924 I redesigned and reconstructed the 500 watt broadcasting station WLK of Indianapolis, Ind. This station which was put into operation in Berrien Springs under the call letters of KFGZ made an enviable record.

I toured a number of Radio stations in Europe in 1925. This engineering trip was made in preparation for the design and construction of the new 4000 watt broadcasting station WEMC. A vast amount of research work was carried on, the sum total of this being inculcated in the plans for the new station. Operating on a frequency of 560 kilocycles, it has been pronounced a high-class broadcasting station by engineers who are qualified to judge. At the present time I am President of WKZO, Inc. This station, known as the Voice of Southwest Michigan, was entirely designed and constructed by me, having crystal control and one hundred per cent modulation.

During the intervening years since my graduation, I have written articles for newspapers and magazines and attended many important conventions held in the interest of Radio. I hold the grade, Member in the Institute of Radio Engineers, Associate of the American Institute of Electrical Engineers, and Engineer Member of the American Society of Military Engineers.

Beyond a doubt the National Radio Institute was instrumental in enabling me to find myself in matters pertaining to Radio. I certainly give a great deal of credit to your Institute.

Yours very truly,

JOHN E. FETZER.

"I thank you for my success"



"Since coming to Omaha, I have always gone from one good job to another. Thanks to the National Radio Institute, at present I am in charge of the Service Department of the Wright and Wilhelm Company, a large wholesale house. I got a \$10 raise the second month I worked. My work has been keeping me very busy, and I really have more to do

than I can comfortably handle—I know that I never would have conquered all those jobs if the N. R. I. had not given me such good training. I might as well thank you for a cash gift and I do thank you for my success in this big game this year."

JAMES W. RINEY,
4220 Corby St.,
Omaha, Nebr.



Runs successful Radio business

3107 S. Grand Blvd.,
St. Louis, Mo.

Dear Mr. Smith:

It is certainly great sport to be in the Radio game and a profitable game it is, too. I am now a member of the firm of the South Grand Radio & Appliance Co. which runs a very successful business in one of the choice shopping centers of the city. We have one of the most complete, up-to-date service departments in the city, and do any kind of work pertaining to Radio. The greater part of all this I owe to the National Radio Institute for the proper training it has given me. Without this training, I could never have been successful in Radio. You started me off right by giving me everything a Radio man should have to become successful. I feel very proud of my N. R. I. diploma, because I know what it means to have one.

Very truly yours,

J. A. VAUGHN

Increases earning power 1000 per cent

110 W. Front St.,
Stockton, Ill.

Dear Mr. Smith:

Upon the completion of your course I started in the Radio field as a service man for a Radio store. After working some time in that manner, I decided to go in for myself and I have been operating my own store and service station for some time now.



In order to build the business soundly, I put my most serious efforts to the servicing end of the business, realizing that anybody can sell sets, but very few can do an intelligent job of really repairing them. My service department now brings in work from the surrounding small towns and country side. My latest addition to new business has been the contracting with the local theatre to take care of their entire sound equipment.

At the close of each Radio year, I can look back and see clearly what tremendous value your practical course in Radio has been to me and realize that without your training my business probably would not have been started in the first place; or if it had, without the many practical ideas obtained from the course, I could not have possibly continued in the business to this date. I really believe that my earning power has been increased 1000% since I took your course and as more business years roll by, I see no reason why it won't increase, as I am endeavoring to build for the future and not just for today alone.

Very sincerely yours,

R. L. HANSON



\$4,200 a year as Radio Engineer

4509 N. Mansfield Ave.,
Chicago, Ill.

Dear Mr. Smith:

I thought you might be interested in knowing of my experience since completing your course.

I was located in a small town in North Dakota where the opportunities for doing anything were very limited. One day I noticed one of your advertisements in a magazine, sent for the details, and later enrolled in your home study course. Shortly after starting I got busy in the evening soliciting service work in the neighborhood. This work gave me a good deal of practical experience, so that I was soon making \$20 to \$50 a week in my spare time.

After continuing this way for about six months, I decided to go to Chicago and see if I could not get into Radio full time. I had no trouble at all obtaining a position with the Mohawk Company as Tester and Balancer at a salary of \$35 a week. I stayed there for about nine months and then got a position with the Scott Transformer Company as Service Man.

A short time after that I was promoted to the position of Chief Tester with a very nice increase in salary. Early this year I was again promoted as Assistant Engineer working in the Laboratory under Mr. Scott on experimental and developmental work with a salary of \$4,200 a year.

I hope that in the near future I will have the pleasure of visiting you and thanking you personally for what you have done for me.

Sincerely yours,

CLIFFORD L. COON.

P. S. You will be interested in knowing that another N. R. I. man, Mr. A. Finnie, is Service Manager for the Scott Transformer Company.



This modern building houses the manufacturing activities of the Scott Transformer Company. The experimental laboratory, of which Mr. Coon is Assistant Engineer, is responsible for the improvements constantly being made in Scott Radio receivers and apparatus.

*Good Jobs
like these go
to the Trained
Man*



Operator, broadcasting station



Television Expert



Operator on board ship



Operator of commercial land station



A business of your own



Operating in airplanes or airports



Expert in Radio factory



Radio executive

**NOW
IT'S
UP TO
YOU**



I am ready

**I will do even more for you than I
have done for hundreds of others**

In this book I have pictured and described many of the good jobs that Radio offers you. However, one book, no matter how large, could not possibly tell you of all of them. There are too many. The field is too large—too broad, to be covered completely in one book. But I have shown you that hundreds of fine jobs have opened for men and young men with the right training and hundreds more are being created.

I have also shown you how well, how thoroughly and how efficiently I am organized and prepared to give you the training you need. My course is not new. It is not untried. National Radio Institute training has been thoroughly tested. The results in dollars and cents that it makes for N. R. I. men are clearly shown by the many letters from graduates in this book.

I chose to tell you what can be and is being done, rather than what I might think can be done. I have given you positive proof.

When hundreds of men and young men—just average fellows, too—with no special education, no special ability or talent, can step into Radio and immediately make much more money than they could make in other fields where they worked for years, it surely proves that the money making opportunities are greater here.

The one purpose of this course is to train you to make more money—to give you specialized knowledge that you can turn into increased earnings. The training I offer you today is better than the training which enabled the men whose letters you've read in this book, to accomplish what they have. It is more thorough.

*Good Jobs
bring the good
things of life
You want*

It is more complete. It has since been revised, new subjects have been added, and the latest developments have been included.

By giving you practical experience while learning, more than the average service man in the field gets from two to four years, I fit you for a job that requires training and experience. When you graduate, you are not simply start-

ing out with a theoretical knowledge looking for a place where you can get practical experience. You are ready to take your place alongside men who entered long before you—make as much and perhaps more money.

The Radio field is right, and my training is right. I know of but one reason that can prevent you from winning bigger success. Your failure to act—to enroll—to do your part.

DON'T PUT OFF SUCCESS DECIDE *Now*-ACT-ENROLL

Many a man throws away his chance of ever getting somewhere—of ever earning a worth while salary—because he never gets started. He waits—puts off from day to day. I want you to realize that every act of yours today, what you do or fail to do, is deciding what you are going to be and what you are going to make in the future. Only by thinking about and planning for the years ahead can you hope to win success.

You, like every man, want to make more money—enough to enjoy most of the good things of life and have some left over. There isn't a better day to begin training for bigger success and more money than today. If you wait until tomorrow you will have lost today. If you wait until next week you will have lost this week. If you wait until next month you will have lost this month. You will have lost more than time—you will have lost money. You will have lost the money which increased earnings in Radio should put in your pocket.

Your investment in my course is absolutely safe. You risk nothing. I have agreed to refund every penny of your tuition if you are not satisfied with the Lessons and Instruction Service upon completing my Course.

Training men and young men to make more money is my business, my vocation. My greatest satisfaction and pleasure in life is to make life easier for others by showing them how to increase their earnings.

To make it easy for you to start, I have enclosed an enrollment blank. This same blank has started hundreds of fellows on the road to bigger pay. It can mean the same for you—use it now.

It is up to you. I am ready. My organization is ready. I have your first assignment of lessons prepared, ready to send to you at once so that you will be off to a flying start.

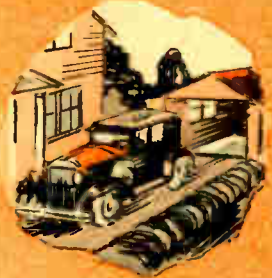
Fill out the enclosed enrollment blank today—this minute—and mail it to me. I shall be looking for it. It will be a genuine pleasure for me to have you as my partner in what I regard the most important undertaking of any man—that of helping him get ahead. ACT NOW.

J. E. Smith

President



A home of your own



A good car



Time for golf and other pleasures



Shows and dances



Time and money for travel



Money invested



Vacations at the sea shore



Money in the bank



Be a Certified Radio-Trician