THE VARIABLE MU TUBES
(Continued from page 14)

"D" for 67.5 volts Eqs. Suppose the signal is such that the automatic volume control forces the grid bias on the controlled tubes to -6. The -24 tube then operates as a detector, while the -51 still operates as an amplifier, although not quite effectively as if the bias were lower. In other words, the -51 will continue to operate as an amplifier without much distortion long after the -24 tube has ceased to operate as an amplifier or as a detector.

This is all accomplished by an entirely new principle in vacuum tube construction. In ordinary tubes the structure is uniform and a constant geometrical amplification constant is obtained. In the new variable mu tube the elements are so arranged that the voltage on the grid at certain places exercises less control on the flow of plate current than at others providing a variable amplification factor. In other words, this tube changes its character from one of very high mu when the signal is weak to one of very low mu when the signal is strong. By means of this principle the plate current control grid voltage characteristic can be given proper shape to reduce the higher order curvature responsible for distortion and cross-talk. The advantages of the high amplification factor of the -24 tube are retained at normal voltages, while at high, those low distortion characteristics of a low mu tube are automatically obtained. Therefore this new tube reduces by a large factor, distortion, cross-talk, modulation hum, and associated modulation troubles encountered with the -24 type tube, and permits partially or wholly dispensing with the precautions necessary to overcome these faults.

There are two different variable mu tubes on the market: the '35 and '51. The two differ in the following particulars:

| Screen grid voltage | -51 | 90 volts | -35 | 75 volts |
| Grid bias voltage   | -51 | 3 volts  | -35 | 1.5 volts |
| Plate current       | -51 | 5.3 ma.  | -35 | 9 ma.    |
| Plate resistance    | -51 | 400,000 ohms | -35 | 200,000 ohms |
| Mutual conductance  | -51 | 950 micromhos | -35 | 1,100 micromhos |

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Will You Spend Two Minutes To Help Your Friends?

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

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

Your Name: __________________________
Your Address: _________________________
Your Student Number: ________________

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Graduate F. E. DeMorse in front of his store where he did a business of $30,000 in one year.

RADIO MERCHANDISING ISSUE
Radio and the Plow

MARK TWAIN once commented "Everybody complains about the weather but nobody does anything about it."

True enough, in Mark Twain's time, but since then Radio has stepped into the breech.

While man has yet to devise a successful machine to produce rainfall; avert hail and frost—Radio has materially reduced their ruinous effects.

Crop months are here. The farm Radio has changed overnight from a luxury—a means of entertainment during long winter nights—to a necessity.

During the next several months the farmer will look to his Radio not only as a medium of dollars and cents information on market price reports—but for information on weather conditions. Weather is the most important of the many hazards of the farm; second only to insect invasion.

As the fields begin to show green they become fair prey for a host of insects and diseases, fifty of which are known to affect wheat. Defensive measures broadcast by Radio by the U. S. Department of Agriculture, State Agriculture Departments and Colleges are a great help to the tiller of the soil in combating these blights.

The weather, day by day, becomes of prime importance. While in the case of field crops, little can be done about it, the fruit grower can take steps to protect his orchards by acting on the information broadcast by the Weather Bureau.

Many a good crop has been ruined by a sudden storm during harvesting. Radio weather reports permit planning of harvests to prevent such occasions.

It does seem strange that such a large number of farm homes are still without Radios, when we consider their value to the farmer.

Radio-Tricains—there's a market for you which is gold! The farmer of today needs little selling—he is no back number. He realizes the trend of times—he's modern—he wants conveniences—pleasures. He has been been sold numerous products on the appeal of luxury; how easy then it should be to sell him—Radio—a farm implement as important as his plow.

J. F. SMITH

Builds Speaker in Ship Model

With an eye to the artistic and the hand of a master craftsman, graduate Joseph L. Webb, of Lowell, Mass., has put over a new one. Knowing that ship models are popular as ornaments for radio sets, Webb has built a loud speaker into one of them. The speaker is in the middle sail of the ship.

In a recent letter to Mr. Smith, Webb said: "I thought I knew all about Radio.

when I enrolled with your school, but when I started to get into the lessons I realized that I didn't know very much about it at all.

"From the time I started studying with you until I graduated, I made about $2000. I would not have made one-quarter of this amount if I had not taken your course."

I am enclosing a picture of my car that I have bought on the Spare-Time money made in radio.

My motto is—"Join the N. R. I. and learn the radio game in the right way and you can have the better things in life."—Lawrence Ritter, Orland, Ind.

Old Philosopher says, "Huncking your horn doesn't help as much as steering wisely."

A Graduate Talks About His Radio Business

The firm of Smith and Wilson was organized in April, 1930. Our shop was built in Mr. Wilson's home about ten blocks from the center of the city. No noise—small overhead expense.

We spend about $20 a month for advertising in the evening paper. Our number is listed in bold type in the classified section of the telephone directory. $18 a year. Our time is chiefly devoted to repair service, but we also sell Clarion and Silver-Marshall sets.

Our policy is to do real good work, charge a reasonable amount and make friends. The friends we make now will be our best asset later.

Every set we service has a little sticker (printed on yellow gummed paper) pasted on the back. It reminds

Serviced by

SMITH & WILLSON
"Radio Specialists"
132 Falconer St., Jamestown, N. Y.

IN CASE OF TROUBLE: DIAL 36-414

Test Data:

This sticker in original form is on yellow gummed paper, size 3½ by 1¾ inches.

the customer where to call for service and has a small space for service test data which might prove valuable on a later service call.

A few days following each service job a postcard is mailed the customer. We mail it rather than hand it to him at the time the job is done because it attracts more attention—gives us an additional contact with him and shows that he is not forgotten once the service man leaves the customer's home. It shows

(Please 14, please)
The Merchandiser
By E. R. HAAS

The general definition of merchandising is "dealing in the objects of commerce.

Radio merchandising, therefore, is the buying and selling of Radio material, equipment, or service.

To the Radio man, who has business ability as well, the Radio merchandising field offers a wonderful outlet for his combined talents.

Watch the growth of a Radio-Trician with these qualifications, in the business standing of his community. He starts out with practically nothing. He does not merely pick up service work where he can get it. His business ability steps in—it shows ways and means to obtain more business than the average Radio man. Soon he is in a well equipped shop of his own. His business ability has made him live within his income and reinvest profits in his shop.

The shop grows to a store. Franchises are secured for popular Radio equipment. Expert work and good judgment have built good will and increased sales.

Intelligent purchasing has added to the profits. In an incredibly short time, we see our Radio-Trician an employer of servicemen and salesmen—figuring in the commercial life of his community.

"Blowing your own horn" is a good idea from an advertising viewpoint, provided the sound does not become a nuisance to others.—Milt Parsons.

A Thought for the Month

One ship sails east and one sails west. By the same wind that blows; it's the set of the sail and not the gale. That determines the way it goes.

Like the winds of the sea are the ways of fate. As we journey along through life: it's the set of the soul that determines the goal. And not the stress nor the strife. —Selected.

Help the Customer

A customer comes into your store and asks for something you do not carry or which is out of stock. What do you do?

Do you say, "I haven't got it," and let the customer walk out—or do you try to help him—render him a service?

You can make a friend out of that person. Make him feel his needs are a real responsibility to you. Maybe you can't sell him anything—can't make a profit now—but you may later—if you make him remember your courtesy.

Here are four substitutes for "I haven't got it"—all of which can mean dollars in your bank account. Show him something similar. Offer to order it from the factory or jobber. Ask him if you may deliver it tomorrow—then buy one retail locally and take it to the customer. If he can't wait for the order to go through direct him to a store where he can get it.

F. L. Sprayberry gives
INSTRUCTIONS for OPERATING THE TESTER

In last month's issue of National Radio News, Mr. Sprayberry gave details for building this tester. He now concludes his series by giving full instructions for operating. The "News" for July will carry the regular service data sheets on these pages.

The tube is removed from the receiver and the test plug inserted in the socket in place of the tube. The tube is then inserted in the proper socket. The receiver is now turned on and you are ready to make measurements. Set switch $S_1$ to the proper position depending on whether the tube is a 4 or 5 prong. If the tube is of the A.C. type, press the four-volt push button and filament voltage will be indicated on the four-volt range of the A.C.voltmeter.

If the tube is of the D.C. type, set the switch $S_2$ to the proper position and set switch $S_3$ to the 10-volt range. Then press the push button of the filament D.C. switch and filament voltage will be indicated on the D.C. voltmeter.

Next we measure the plate voltage. Set switch $S_2$ to the 500-volt scale and press the plate voltage push button. The plate voltage will be indicated on the D.C. voltmeter. Drop back to lower scales by resetting $S_2$ either on the 100 or 50-volt scale in order that the value may be correctly interpreted.

Then we measure the grid voltage, setting switch $S_2$ to the proper position and $S_3$ to the proper voltage range. The grid voltage push button is then pressed and grid voltage is indicated on the D.C. voltmeter.

Current measurements are always made after voltage measurements in order to protect the meter against burn-out. It is possible that voltage measurements will burn out the voltmeters, but if the tube has an internal short circuit, the high current drain may cause the milliammeter to burn out. If the tube does have an internal short circuit, little or no voltage will be indicated on the voltmeter and for that reason do not make a current measurement until you are sure that the tube is not short circuited internally.

First, make plate current measurement on the 150 milliamperes scale of the milliammeter. Then, if the current indicated is not more than 15 milliamperes, reset $S_2$ for the 15 milliamperes position which will give you a more accurate indication of the current value.

With switch $S_2$ set to No. 3 position, the milliammeter is cut out of the circuit and, therefore, cannot be damaged by an overload of current.

Cathode voltage can be measured on this tester either positive or negative, by setting switch $S_2$ to the B position and pressing the cathode push button. If the meter tends to read backwards, reverse the position of switch $S_2$, which will cause the meter to read in the proper direction. This also applies to D.C. filament and any other measurement which the voltmeter tends to read backwards.

The test plug is shown with six prongs. However, it is understood that the sixth connection or the control grid connection is made to the top of the test plug handle as indicated in Fig. 2.
DOES YOUR WINDOW SELL MERCHANDISE FOR YOU?

Your store or shop window reflects the personality and character of your business. Customers, prospects and the "passer-by" judge your organization by the part which can be seen from the street. The window dresses up your establishment. With half a chance it will sell for you. A fine advertisement which costs little, if properly handled, but exactly the opposite if hit or miss methods are used.

Note the care exercised in the window displays of the big Department Stores of your town. Frequently changed, they show timely and seasonal merchandise. They get and hold attention; they sell merchandise.

Graduate H. A. Mueller, recently returned from a trip to Europe, sends us some valuable information concerning window display, compiled by the University of Koenig, Germany.

The height and width of the window have each been considered as 100% on the chart below.

The sub-divisions show the most important portions from the "attention" point of view. The "attention degree" is indicated by lines. Consequently—the more lines—the more valuable the space. A careful analysis of the chart will show the relative importance of the various window sections.

Below are some helpful pointers on the subject of window displays. Exercise care with your window and it will pay you many times for your efforts.

PLAYING THE GAME

...for when the one great scorer comes, to write against our name, he questions not what we've lost or won; but how we've played the game.

Fred Taylor was one of the most promising youngsters who ever came up from the minors. He had his chance in the American League when most pitchers of his age were still playing sandlot baseball. He broke into big company early. Critics picked him as a "big find."

For two years he upheld every promise which had been made for him. Well trained—pitching his team to victory after victory—and when the club clinched second place in the league the newspapers praised his work as a big factor in the team's rise from the second division.

His third year in the big league started—then came the slip. Taylor "let up" on his training. Of course, he went through the motions—the management insisted on that—but his heart wasn't in the work. His losses increased—his wins were less. Not only was he a traitor to himself, but to his team. He ruined their chances for a pennant—and the resultant share in the world-series profits. His actions and general attitude were as our English brothers put it, "Not cricket," or as we'd say—not playing the game.

How many of us are Fred Taylors? Maybe we don't even realize it. But—stop and think—look things in the face. Are we playing square with ourselves with those dependent upon us? Are we preparing to get the best out of life—are we Playing the Game?

I've often said I have little sympathy for the fellow who can't succeed in this age of opportunity. We can't always expect success to come at the first trial. Perhaps we didn't try hard enough—or our success may have been retarded temporarily by some mistakes we've made. Bear in mind that most worthwhile things are made by first making mistakes. We learn much by our errors.

The game fellow who puts up a fight against odds and loses, has the crowd pulling for him—but the fellow who won't fight back is—well, the less said about him, the better. He just leaves a bad taste.

Play the same. Play it for yourself—for those who depend on you—for those who trust in you to succeed. Don't be a Fred Taylor—don't slack on your training. Hit the ball and Play the Game.

To Students and Graduates in Ohio and Kentucky

N. R. I. men living in towns in Ohio and Kentucky, having a population of 5,000 or over, and who wish to establish themselves locally in a radio sales and service business of their own, without investing much money, may write to Student Walter C. Willard 718 Columbia St., Newport, Ky., who has a proposal to make. Write Student Willard direct. We are simply passing the word along to you.
TELLING THE WORLD
By E. L. DEGENER
Director of Publicity

A great philosopher once made a statement to the effect that if a man built a better mouse trap than his neighbor, even though he lived in a forest, all the world would beat a path to his door.

That may be good philosophy, but it's poor business.

The modern mouse trap builder, or Radio Serviceman or Salesman, doesn't wait for the world to find its way to his door. In the first place he does not hide his door off in the forest. He tells the world about himself—where to locate him—what his business is.

Maybe he starts building his products—or preparing his services in obscure surroundings, but when he is ready to market them—he goes to the highways. He "cries his wares."

He moves his business to a place where customers can find him—then he uses every means at his command to help the world know him.

It pays to advertise yourself. If it didn't—large well managed organizations would not spend hundreds of thousands of dollars annually for publicity purposes. Fifteen thousand dollars spent for a one page ad in a periodical is not unusual.

How to tell your customers—your world—is your problem. A method of presentation which will appeal to one class of people may be a failure with another class. It is a problem which requires careful testing to find the most effective means. Find out which plan pays best—then "bear down" on that particular method.

One naturally thinks of newspapers when considering local advertising. And logically so. But there are other ways which may work out as well—sometimes better.

Sales letters to a list of prospects or customers have been used effectively by N. R. I. men to solicit service work and sales. This plan is generally referred to as the "Direct Mail Method" and is widely used to obtain sales prospects—prepare the way for salesmen to call, and it has been remarkably successful in the sale of service contracts.

While less effective—the "Circular Method" of advertising is also less expensive. Simple printed circulars or cards—offering Radio service are dropped in the mail boxes of prospects.

Don't make the mistake of trying to write "clever ads." Too much clever advertising matters finds its way to the trash basket. Be content to present your story in a brief, clear manner—just a definite statement of facts which tells your prospects about your business.

Below is a "Direct Mail" Sales letter which has brought a lot of work for the N. R. I. Graduate who originated it. Just one way of Telling the World.

Is your Radio working like it was the day you bought it? It should be.

Even the best Radio set will deteriorate. It should be inspected by an expert and corrected before the condition becomes serious.

I'll look over your set—regularly, or when called—keep it in tip-top condition. The cost of this service is very small—it more than pays for itself in satisfaction alone.

My technical experience and knowledge of Radio are unreservedly at your call.

Simply mail the postcard which I am enclosing (no obligation whatever). I'll gladly call and discuss the matter with you—any day or hour to suit your convenience. May I hear from you?

In order to provide maximum sensitivity for the handling of weak signals while at the same time safeguarding against overloading, modulation distortion and troublesome cross-talk on loud signals, a new screen-grid tube known as the -51 and -35, has been placed on the market by several tube manufacturers.

The technical name of this new tube is Variable-Mu Tetrode. It is a development of Stuart Ballantine and his associates of the Boonton Research Corporation of Boonton, New Jersey. It is designed as a Radio frequency and intermediate frequency amplifier. It is not ordinarily interchangeable with other tubes because it must be used in circuits built for its characteristics. It is intended for use in broadcast receivers which control volume by varying the control grid voltage. This tube has the general appearance of the screen grid tube; its design is such as to permit easy control of a large range of signal voltages without the use of local distance switches or antenna potentiometers. This feature makes the tube adaptable to automatic volume control design.

Modulation distortion as you probably know is caused by non-linear amplification characteristics of the R.F. amplifier tubes. This occurs in ordinary receivers when receiving from nearby stations, the result being an increase in modulation of the signal, accompanied by increase distortion of the output. This distortion becomes worse as the input to the tube increases, and is particularly evident in the -24 tube owing to its sharp plate current cut-off. Cross-talk comes about from the same tube characteristics responsible for modulation distortion, the R.F. amplifiers acting as detectors or modulators, instead of amplifiers only. In most instances, this is caused by the first tube, causing inter-modulation in the R.F. tubes between a desired signal and a strong interfering signal of different frequency and results in the two signals being heard simultaneously when tuning to the desired signal, both signals apparently tuned at the same point. The elimination of this type of interference has necessitated the use of double and triple pre-selector circuits between the antenna and the first tube of the receiver.

The production of cross-modulation can be understood by studying Fig. 1. The curves "C" and "D" indicate the relation between grid voltage and plate current taken on the -51 tube under the same screen and plate voltage conditions.

Characteristics of the New Variable Mu Tube

![Characteristics of the New Variable Mu Tube](image-url)
How Much Technical Knowledge Should a Radio Salesman Have?

Here's an old saying among salespeople: "To sell anything, sell it on your own, and your customers will buy it." You must feel your merchandise is your customers' best buy. More sales are lost through the salesman's lack of confidence in his goods than through any other single factor.

If a Radio salesman doesn't have a thorough technical knowledge of Radio, how will he know that the product he sells is superior to others in the same class? He may say it is, but unless he knows it is, he cannot be "sold" on it himself. His sales talk will lack "punch.

T. E. ROSE vocational Director

To make matters worse, the Englishman asked: "How many stages of amplification does it have?"

Hurler was in a bad fix. "Why—why," he mumbled; then he dived for the service book, thumbed the pages hurriedly, seeking the section devoted to construction details.

"Never mind," the Englishman broke in impatiently. "See me some other time.

When it was learned a competitor had sold the Englishman, Hurler was "called on the carpet." He was told if he wanted to hold down his job, he would have to learn something of what he was selling. Shortly afterward, as Vocational Director, I met a most determined N. R. I. student—Hurler. A salesman not only has to know Radio, but he also has to explain it in terms understandable to the prospect. Try sometimes to explain Ohm's law or the atomic theory to somebody who never heard of either.

There is a vacuum cleaner company of world-wide reputation which trains new salesmen on full pay for six weeks before sending them into the field. More than 90% of the prospects the salesmen are trying to convince his prospect of the value of the receiver. Go into details, point out superiority of the set. Yes, but he didn't know anything about them!

"Never mind," the Englishman broke in impatiently. "See me some other time."

Hurler was "stumped." What other argument could he use to convince his prospect of the value of the receiver? Go into details, point out superiority of the set.

T. E. ROSE Vocational Director

SUCCESS!! — SUCCESS!!

Judges award prizes for best Letters in "RESULTS CONTEST"

The "News" has just received the final word from the Contest Judges. The big Results Contest has come to a close. Every member of the N. R. I. Faculty and Staff joins the "News" in congratulating the winners.

World Wide

One important point was brought out by the Success letters which were received. Success of N. R. I. men is not confined to any one section-state or country. Letters were received from N. R. I. men in the United States, Canada, Poland, Egypt, Australia, China, Japan, and British West Indies. It's not locality which makes success—it's the man and his training.

Inspiration

Read these winning success letters. They contain ideas of value— but all of them will prove an inspiration. If any man can read all these stories of success—accomplishments of just every-day average fellows—and not get a thrill from it, he's a better man than your editor.

The $50 Grand Prize Winning Letter

Dear Mr. Smith:

Three years ago I was a bank clerk in a small town bank at a salary of $100 per month. Promotions are very slow in such a bank and I was anxious to earn more money. I have a wife and baby and one of our ambitions was to have a fine home of our own.

One day my attention was arrested by the advertisement of the National Radio Institute. After some deliberation I enrolled for the course and I proved to be the luckiest thing I ever did.

As soon as I had completed a number of lessons I began to do some work very successfully. Soon I took the agency for two well known makers of radios and during these three years I have built up a very profitable radio business. My gross income for the past three years totaled $7,650.05 compared to $1,500.00 salaries in the three years preceding my enrollment with the National Radio Institute.

We are now enjoying our new home, a new car and many other things that my increased income has made possible. To N. R. I. I give all the credit.

Bernard L. Sellers, Monmouth, Oregon.

THE HOME N. R. I. BUILT

Count, can help the student understand the tingle of success possibilities.

Winning Letters to be Published

The list of winners appears in this issue of the "News." Each future issue will carry prize-winning letters until all have been published. The letters of Bernard Sellers, winner of First Grand Prize, and Edwin Francis, which took Second Grand Prize, are in this number.

Why We Did It

A number of students and graduates have written in asking "What is the idea behind the Results Contest?" The answer is simply this—I want to know what our boys are doing—how they are succeeding. We want to pass on the good news along to others.

This contest gave us a fine chance to get acquainted. We want every N. R. I. man to keep in touch with the Institute—to tell of his work—his accomplishments.

Don't stop—just because the Results Contest is over. If you buy a new car—tell us. If you land a new job—we want to know. Let us have a picture of the new house you're building—or the girl you just married who is going to (Next page, please).
live in the house. How did you handle the special Radio job for your home town banker—after the other service men in town fell down on the job? We're curious fellows up here at N.R. I. and we're interested, fellows. We want to know what you're doing—we want to hear your success.

This Letter Won $25

Dear Mr. Smith:

Since I first enrolled as an N.R. I. student I have had the following results:

When I commenced I was physically unfit for other labor due to an accident to my leg. Now the other laborers know I am out of employment, while I have a store known as The Almont Radio Shop and am making a living for myself, my wife, and two children. I know what N.R. I. did for me. I knew nothing of Radio when I enrolled, and now, while other men seek employment of any kind, I have plenty of work and a store on Main Street. I am gradually winning the confidence of the people here, as a sure enough Radio-Technician.

I have a battery service and am authorized as dealer for R.C.A., Crosley, United, and Westinghouse Radios. I have a change in a few short months from a crippled laborer whom no one cared to hire, to a man in business and earning a good living for a family.

N.R. I. did it for me. Two years ago I thought I was down and out, but now I know I am just beginning. Watch my smoke from now on!—Edwin W. Francis, Box 206, Almont, Mich.

THE CONTEST WINNERS AT A GLANCE

First Grand Prize—$50...........Bernard L. Sellers, Monmouth, Oregon
Third Grand Prize—$15............Frank McClellan, Troy, N.Y.
Special Prize—$10..............Peter Dusninki, Luck, Wollnyen, Poland
Lee Saunders, Wewoka, Okla. ....$15
Herbert Jones, Chicago, Ill. ......$10
S.L. Matheos, Lake City, Utah ....$10
Chin Wong Fong, Bangkok, Siam ....$10
A B. Blair, Thief River Falls, Minn. ....$10
John J. Reider, St. Paul, Minn. ....$10
N.G. Mavroumatis, Port Sall, Egypt ....$10
K. W. Griffith, Little Rock, Ark. ....$10
D. Walter Burrell, Temple, Pa. ....$10
James H. Richarden, Mt. Vernon, Wash. ....$10
Paul West, Franklin, N.C. ....$10
Herbert E. Jenkins, Waldeck, Sask., Canada ....$10
James R. Sowell, Pulaski, Tenn. ....$10
Henry Simmons, Perth, Western Australia ....$10
Sidney Mechlovich, Brooklyn, N.Y. ....$10

O. H. Hansen, Stoughton, Mass. ....$3
Clyde S. Nelson, Indiana, Ind. ....$3
Ralph S. Walker, Columbus, Ohio ....$3
M. J. Reiff, Alton, I. ....$3
Jno. J. Werbinski, Detroit, Mich. ....$3
Wm. T. Ragland, Chicago, Ill. ....$3
Chas. H. Behrens, L. I. City, N.Y. ....$3
Kermit A. Stromh, Pickettster, O. ....$3
Ellen Warren, Chicago, Ill. ....$3
Hans P. Jung, Hong Kong, China ....$3
Irvin S. Dunham, Duluth, Minn. ....$3
John I. Haskin, Merrill, Ore. ....$3
Douglas F. LaPorte, Prescott, Ont., Canada ....$3
F. Oliver Hill, Grand Cayman, Bermuda ....$3
B. W. I. ....$3
Michael Piglar, Delawanna, N.J. ....$3
Willis H. Johnson, Quaker City, O. ....$3
Ralph Mollo, Pottstown, Pa. ....$3
Herbert A. Umnus, Manhatoroc, Wis. ....$3

COMMENTS REPORTS SUCCESS

I was working at my trade as an auto mechanic when I was sent a job with the aid of the Service Service. I spent a few days working after leaving the grease and dirt of the garage. Since then I have made enough sales alone to make real money and I have made better than $20 per day at times. I am now connected with the L.N. Messenger Radio Station of this city—A. B. Cummins, Valleym, Calif.

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MORE OF WARNER'S IDEAS

1. If Majestic sets have a peculiar noise in the R.F. section, solder all connections on the R.F. by-pass circuit. (Do this on ground connections only.)
2. If the same type set sounds mushy and the trouble is traced to the dynamic speaker field, take the speaker apart and the trouble may be a short in the voice coil.
3. In Radiola 44 be sure connections to chassis on shield cans are clean or else oscillate.
4. In Silver Marshal (certain models) the spriral that runs above the tube socket may break and short the contact to the base of the tube.
5. If Sparrow models are dead look for the resistance on the terminal strip to be open before blaming the trouble on the filter block. (Walter W. Warner, Cambridge, Md.)

I am working for one of the leading Radio stores here. I am getting extra contacts at Atwater Kent, Majestic, Philco, Edison and General Electric, and many other types of batteries and electric sets.—Lewis W. Fenton, Pen Yan, New York.
A GRADUATE TALKS ABOUT HIS RADIO BUSINESS
(Continued from page 3)

him also we have confidence in ourselves and gives him confidence in us.

Taking into consideration that the average set owner knows little about Radio I have attempted to educate my customers—to eliminate complaints which might be made against my service and which are not my fault. I have prepared a short article (covering about two pages typewritten) which I am putting in the hands of every customer. I tell them how to install the receivers and where to use the set. It tells the why and wherefore of static, selectivity, station interference, fading, aerials and ground, tubes, etc.

This plan serves to show my customers

THE VARIABLE MU TUBES
(Continued from page 9)

as the two curves “A” and “B” for the -34 tube. You will notice that for grid bias voltages less than about -3.5 volts all the curves are practically alike as far as the amplification constants are concerned, for the corresponding curves are parallel and the slopes are the same.

However, for grid bias voltages above -3.5 volts the character of the curves of the two tubes change. The curves for the -34 drop to zero rapidly while those of the -35 flatten out, and approach zero much more positively and gradual; this indicating the amplification factor has changed to a lower value.

To operate a tube as an amplifier the tube has to work on some point upon the straight portion of either of these curves. From these curves it can be seen that there will not be nearly as much cross-talk from one tube as there would be if the grid bias were at the old set.

This led me to believe that possibly within the next three years there may be just as great improvement in Radio reproduction, although it hardly seems possible now. But ourears may keep on becoming better educated and it will require better and better reproduction to satisfy them.

RADIO SALESMAN'S TECHNICAL KNOWLEDGE
(Continued from page 10)

men interview later are women having even a speaking acquaintance with things mechanical. Yet only three weeks of the salesman’s training period is given over to the art of salesmanship! The other three weeks are spent in instructing the salesmen in electric motors, mechanics, rug-weaving, etc. In short, the salesmen receive a limited but comprehensive technical education in every phase of the business. Simply, two outlets—salesmen and cleaners and their sales record is ample proof of the value of technical training for salesmen.

Speaking of sales records, it seems appropriate here to mention one made for a particular manufacturer, in 1930, by N. R. I. trained men. The receivers range in price from $95 to $200 and upward. Keeping in mind that most of

these students and graduates worked only in their spare time, this record (see list), is one that both N. R. I. and the men themselves are justly proud of.

How much technical knowledge should a salesman have?—The answer is simple: “All he can possibly get.”

The Office Pup says—

There are 23,200,000 pleasure car owners in the United States, a lot of whom are going vacationing this summer. The problem of taking Along 'n' Andy along, Sell 'em automobile Radios.

June is the “Month of Brides” — folks starting housekeeping. Marriage license notices will give you a good lead on live prospects for Radio sets.