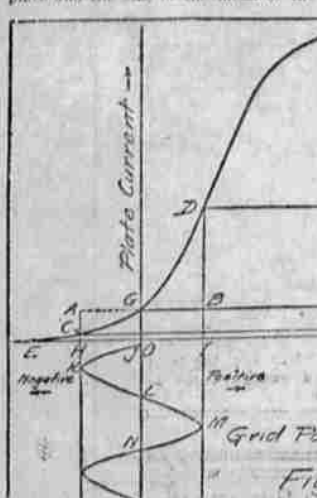


RADIO

POSITION AND SIZE OF GRID IMPORTANT

Determine Value of Negative Potential Necessary to Reduce the Plate Current to Zero.

In using a three-electrode vacuum tube in a radio set it is preferable to maintain the grid negative with respect to the filament in order to require the minimum amount of energy in the control of the plate circuit.



grid, determine the value of E_g is the negative potential which must be applied to the grid in order to reduce the plate current to zero. The value of P , which is the positive grid potential that will cause the maximum or saturation current to flow in the plate circuit, is also determined by the relative position of the grid with respect to the filament and plate. If the grid is of very fine mesh, the value of E_g is small because the electrons in passing through the small mesh of the grid on their journey from the filament to the plate will be negatively charged the grid and will be repelled. Similarly a small positive charge applied to a fine mesh will tend to accelerate the velocity of the electrons.

In case of a very coarse mesh grid, the electrons can pass through the apertures in the grid without coming in so close to the charge on it and a relatively high potential will be required on the grid to control the electron stream, or in other words, the current flowing in the plate circuit.

Referring to Fig. VII, O-G, is the current that will flow in the plate circuit when there is no potential applied to the grid. Suppose a positive potential as O-I is applied to the grid. The corresponding plate circuit current will be I-H or I-D, more than it was when the grid had no potential applied to it.

A negative potential of O-H is now applied to the grid where O-H is equal in value to O-I, but opposite in sign. The application of the negative potential when applied to the grid will cause the plate current to be reduced to a value H-C or A-C, less than it was when there was no potential applied to the grid. So it is seen that a negative potential when applied to the grid does not reduce the plate circuit current as much as the same positive potential increased the plate circuit current. This irregular conductivity of the tube is made use of when the tube is used as a detector or rectifier of radio signals.

The incoming radio signal is a high frequency alternating current. Let us simply an alternating difference of potential whose maximum positive value is equal to O-I and whose maximum negative value is equal to O-H. In the grid of the three-electrode tube whose characteristic curve is the same as that shown in Fig. VII. In Fig. IX is shown the alternating difference of potential applied to the grid through the first quarter of a cycle, from zero at A to a maximum negative value at K, equal to O-H. The plate circuit current will vary from O-G, its value at P when no grid potential is applied to a value at Q equal to H-C.

During the next quarter of a cycle the grid potential changes from a maximum negative value at K to zero at L. The corresponding values of plate circuit current are shown by the portion of the plate current curve Q-R.

During the next or third quarter of a cycle the applied grid potential increases from zero at L to a maximum positive value at M, equal to O-I, and causes the plate current to increase from J-H, its value when the plate potential is zero, to I-I, an increase in plate current equal to H-I.

During the remaining fourth quarter of a cycle as the applied grid potential varies from a maximum positive value at M to zero at N, the plate circuit current varies from a value S to T.

Assuming that the characteristic curve as shown in Fig. VII and Fig. IX was with a potential of 40 volts on the plate, then, if the plate circuit is to be reduced to zero by a variation of plate voltage, with no potential applied to the grid, the plate voltage must be reduced to zero or a reduction of 40 volts must be made.

Must Be Handled Cautiously. If radium were as plentiful and as easily obtained as gold everybody might have a little of it in thick lead boxes to protect themselves against its dangerous rays, which it never ceases to give off until in some thousand years it exhausts itself, leaving behind it something very

If the 40 volts is maintained on the plate and a negative potential of 40 is applied to the grid, it will reduce the current to zero.

Suppose O-E represents five volts. It can be seen then that a change of five volts in grid potential will accomplish the same result that 40 volts will in the plate circuit. The ratio of the voltage change in the plate current is called the factor of the tube and is denoted by the letter "K."

In the tube just discussed the amplification factor would be 40 divided by five or eight. The amplification factor of the tubes available for amateur use at present is usually between 4 and 10. The amplification factor is a function of the dimensions and relative positions of the elements in the tube.

An incoming radio frequency alternating current applied to the grid of a three-electrode vacuum tube is not only rectified but the variation in the plate is multiplied by "K," the amplification factor of the tube. This

makes the three-electrode vacuum tube most sensitive detector available. In actual tubes the point "G" on the characteristic curves as shown in Fig. VII and Fig. IX may not fall on such a point of the curve that symmetrical changes in grid potential will cause a symmetrical change in plate current starting with zero potential on the grid.

It then becomes necessary to apply a constant potential to the grid by means of a battery in the grid circuit, called the "C" battery, to maintain the grid at such a point on the characteristic curve that symmetrical changes in grid potential will cause the maximum symmetrical current to flow in the plate circuit.

Big Ship's Radio. The radio equipment of the ships Paris and Lafayette is described in a recent issue of Radioelectricity. On both steamers a five-kilowatt tube transmitter has been installed with a wave range of between 2000 and 9000 meters. A five-kilowatt motor-generator set is used to produce the plate-high tension for four rectifying and four oscillatory tubes, and the low voltage current for the heating of the filament of these tubes. Both vessels are equipped with a radio range-finder, or "radio goniometer," which, reduced to plain English, means a radio compass. A distance of 3,400 kilometers has been covered safely by messages sent from the transmitter of the Paris.

Radio for Animal Training. Experiments with the radiophone as an aid in animal training are to be made at the Hippodrome, New York city, by George Power, trainer of the elephants, to determine whether it will be possible for his big pets at some future date to execute his orders on the stage while the trainer himself is absent.

Professor Bell a Radio Fan. Finding the telephone, his own invention, a source of annoyance to him, Alexander Graham Bell had it removed from his home. With the radiophone, there is a difference. It seems, for Mr. Bell, now seventy-five years old, is said never to tire of "listening in" and experimenting with the new device. There are few more ardent enthusiasts, declare his friends.

RADIO DON'TS

Don't expect the circuit to oscillate with equal strength over a great range if you tune the grid circuit with capacity alone. Keep the ratio of L to C as near constant as possible while tuning.

Don't expect a circuit to oscillate if the natural period of the tickler circuit is equal to the natural period of the grid circuit.

Don't place the tickler or plate variometer tight against the grid coil or a change in the plate circuit will detune the grid circuit.

Don't expect high impedance tubes to oscillate freely in a circuit designed for low impedance tubes.

Don't discard a regenerative receiver until you have tried more than one detector tube.

Don't forget that a soft gas-filled tube is the best detector, and that a hard tube is the best oscillator.

Don't treat inductance coils with shellac or any other varnish or compound that will absorb moisture.

The Silent "H." The letter "H" is not pronounced at the beginning of the word hour, heir, herb, humor, honest, honor, and their derivatives. Many people are unaware of the fact that the word hour does not have its "H" sounded. It is silent also when it comes after the letter "r," as in "hourly."

Churches

All church notices must be in the hands of the editor by 4 p. m. Friday afternoon.

LATTER DAY SAINTS. Regular services at the Tabernacle, Sunday school commences at 10:30 a. m. Sacramental services at 12:15 o'clock p. m. Mutual Improvement Association, Sunday at 7:30 p. m. Priesthood and Relief Society meeting at 7:30 p. m. Primary association at the tabernacle Tuesday, for children, 4 p. m. Primary association for children, Thursday at 4 p. m. Religion class at tabernacle Thursday at 2:30 and 4 p. m. Religion class at the chapel on north side at 2:30 and 4 p. m. Tuesday. Regular choir practice at the Tabernacle Thursday at 7 p. m. The public is cordially invited to attend any or all of our services.—David I. Stoddard, Bishop.

First Church of Christ, Scientist. Corner of First and Washington, Sunday morning service at 11 o'clock. Subject, "Christian Science." Sunday school at 9:45 a. m. Wednesday evening meeting at 8 o'clock. Reading room open to the public every Monday, Wednesday and Saturday from two to four. All are welcome to attend our services.

Presbyterian Church. Give the habit of church going full hold of you. We are ruled by habits, some good and some bad. Be sure to form good habits—and the best habit you can form is that of regular attendance. The church helps make this a better community, so do your part to make the church strong and more helpful. And don't forget the religious instruction of your children. They are welcome at Sunday school. Regular session and church service this coming Sunday morning. In the evening the summer schedule in our church with the minister preaching. The Rev. G. H. Quigley will be one of the leaders. The quartette will sing some special numbers. We will all want to share in this service, so come with others, at 8 o'clock.—W. C. Ross, minister.

The Rev. R. Bogstad will conduct services in Zion's Lutheran church Sunday, the 25th, at 11 p. m. Zion's Lutheran is located opposite the high school. Everybody welcome.

First Methodist Episcopal Church.—"Gift or Bargain?" will be the sermon subject at the forenoon service. Mrs. Altich and Mr. Quigley will sing the duet, "Hark! Hark! My Soul," by Harry Rowe Shelley. Bible school at 9:45. Claude Cooper, superintendent.

Paint With Air

Consider the importance of painting your farm buildings—sprayed under high pressure—air digs deeper than hair, and is cheaper.

J. A. Rankin
Res. 1304 O Avenue

We Offer

Large house of 7 rooms and bath. Situated in good resident section on lot size 60x110 feet. Good lawn, woodshed. This house is partly furnished. Price \$5000.00. Terms \$1000 cash, balance terms to be arranged.

Vacant lots in most any part of city.

Two acres, a small house, barn, hen house. Price \$1200. \$500 cash, balance on terms.

If it is a farm you want, do not fail to get all particulars about this one. 65 acres, 2 1/2 miles from Summerville, 50 acres under cultivation, 15 acres timber, 6 rooms in house, barn holds 5 head stock. Buildings in fair condition. School within one mile. Price \$1500.00. \$2000 cash, balance long time.

La Grande Investment Company
1201 Adams Ave. Phone Main 753
Solely Licensed to Sell Stocks and Bonds and to Engage in Real Estate

St. Peter's Episcopal Church will have regular services next Sunday, June 25th. Early communion, 8:30 o'clock; church school, 9:45; morning service, 11:00; evening service, 7:30.—Jos. W. Gunn, Rector.

Non-denominational service will be held in the Park Pavilion on Sunday, June 25, at 3 p. m. All are cordially invited. Mr. W. D. Fullerton, evangelist.

Christian Church.—Preaching by the pastor at the morning service, but no preaching in the evening as we will join in the union service at the Presbyterian church. Bible school at 9:45. At the morning service Mr. and Mrs. G. E. Curtis, evangelistic singers, will conduct the song service.—O. W. Jones, minister.

Monuments

Gen. Carr's Memorial, Troy, N.Y.



—We have made a profound study of monument building, and an order placed in our hands is sure to receive faithful, intelligent execution.

Blue Mountain Marble & Granite Company.
1502 S. Ave., La Grande, Or.

Turn the Corner and Save a Dollar

Buy the Foster Fruit Jar. It has a glass top. Fruit does not come in contact with anything but glass. Seals with a clamp.

Quart size \$1.85 delivered
Pint size \$1.65 delivered
Extra glass tops 25c per doz.

J. G. HOLM

GROCER
Quality and Service
—FREE DELIVERY—
CALL MAIN 43

WHO ARE YOU?

NINETY-NINE chances out of a hundred you are the man whose second finger on the right hand is expert in pressing electric buttons.

An electric button is a pretty small thing. By it we make elevators rise and fall for us, we give orders, we summon employees, we start big machinery whirling, we turn the light on and off, we could go on indefinitely. But remember, it is not the half-inch button that does all this.

There is the tremendous power behind the button; the huge dams and water turbines (in case of water power) or the enormous boilers, turbines, engines and generators (in steam plants); the wires of high tension transmission lines, and the innumerable smaller wires stretching like a web from your very bedside out over the whole country.

1,400,000 people have invested their earnings in the securities of the electric light and power industry. Besides these foresighted citizens there are the investments of insurance companies and the loans made by banks.

They make possible "the button" that your finger presses morning, noon and night. Thirty-five million others enjoy the same instantaneous service.

There are still 14,000,000 homes in the United States remaining to be wired. 14,000,000 unwired homes mean that millions of people are without the benefit of electric light and power in their residences.

Gradually most of these residents will demand electric service, and the electrical industry with the support of the public, will find the means to extend this service to these prospective patrons, so they, too, will be able to press that half-inch button.

Eastern Oregon Light & Power Company

First Baptist Church.—Sunday school 10 a. m. G. B. Hogan, superintendent. Sermon, 11 a. m. Subject, "Authenticity of the Holy Scriptures." Choir directed by Mrs. Frank S. Jester. Young People's meeting at 7 p. m. Miss Ethel McGuire, leader. Union meeting Sunday evening at 8 p. m. at the Presbyterian church. Sermon by Rev. W. C. Ross. The Presbyterians worshiped with us often before their pastor came. Let's visit them in return and let's all go.—A. B. Sifton, minister.

Church of Our Lady of the Valley.—Communion Mass at 7 o'clock. Parish Mass at 9 o'clock. An appropriate sermon on the gospel of the day at each of the masses. Evening devotions at 7:30 o'clock. Rosary, question box and benediction. Week day Mass at 7 o'clock. A cordial invitation is extended to all to attend these services.—A. F. Looser, pastor.

Feeble With Age? A colloquialism that should be banished is "springing a joke." Most jokes of today do not spring; they are pushed and fall helpless a few feet away.—Chicago Journal of Commerce.

RARE STYLE AND GENUINE WORTH IN Suits and Dresses

Finest quality materials, tailored with the most exacting care and styled with the greatest skill, are offered at prices that command easy sales.

They range from \$15.00 to \$37.50.

Campbell Sisters

Ladies' Ready-to-Wear and Millinery



A House May Be Rented But a Home Must Be Owned

The best way to save money is to have an object in saving—and the greatest object in the world is a home of your own.

Thrift is the beginning of home ownership. It will not thrive long in a rented house. A start in saving has been the beginning of thrift and success for millions who have found for the first time a real object to SAVE for—a home!

A thrifty man will build a shelter for his family. It requires only a call at this office to inspect hundreds of designs of modern homes and other buildings. Each design has received the attention of skilled architects of national reputation.

Complete plans drawn for any customer without charge.

The Grande Ronde Lumber Co.

Exclusive Representative of the National Builders Bureau

STAR

TODAY AND SUNDAY

FRANK MAYO

WITH VIRGINIA VALLI HAROLD GOODWIN AND BUG CONNORS IN

"TRACKED TO EARTH"



A horse-thief—the arrest—the escape—the arrest—the escape—the girl—the big surprise

Mystery, thrills, romance, a clean, delightful picture

FROM THE SATURDAY POST STORY "SLIPPER TONGUE" BY WM. J. NEIDIG

DIRECTED BY WM. WORTHINGTON A UNIVERSAL PICTURE

ALSO A TWO REEL COMEDY