

RADIO

THINGS BEGINNERS MUST LEARN FIRST

Explanation of Terms Used in Radio and of Its Basic Principles.

Due to the great interest taken in radio since broadcasting stations have been started, many radio terms are seen and heard that may be unfamiliar to the novice. Some of the most commonly used terms are explained and defined below.

Like light, heat and sound, radio energy is propagated in the form of a wave motion. Every one is familiar with the wave motion set up on the surface of a still body of water by the dropping of a stone into it.

Every time a point on the surface of the waves goes through a complete set of motions and starts to repeat those motions the wave is said to have gone through a cycle.

The number of complete cycles gone through per second is the frequency.

The human ear is responsive to sound frequencies up to a few thousand cycles per second but is not capable of responding to the higher frequencies encountered in radio. Arbitrarily a frequency of less than 10,000 cycles has been called an audible frequency—one which can be heard—and frequencies above 10,000 cycles, radio or inaudible frequencies—because they cannot be heard by the human ear.

The particular type of wave which propagates radio energy is an electromagnetic wave. All of us have seen bits of iron and steel attracted by the little toy magnets made up in the form of horseshoes. This attraction of the magnet for the bits of iron and steel showed the existence of a magnetic

The high-frequency current is known as the carrier wave and its function is to radiate into space in the form of electromagnetic waves and by its variation in amplitude carry with it the variation in the tone at the transmitting station.

It is the frequency of the carrier wave that determines the wave-length on which a radio station is transmitted. By experiment it has been found that electromagnetic waves travel at the same velocity that light waves travel, that is, 186,000 miles per second. Wave-length is the distance between any two similar points on two successive waves; for example, the distance from crest to crest of any two successive waves in the same direction, measured in meters, is unit of length equal approximately to one and one-tenth yards. Converting 186,000 miles to meters, the equivalent is 300,000,000 meters. The length of an electromagnetic wave is equal then to 300,000,000 divided by the frequency. Suppose a station was transmitting on a wave-length of 300 meters. The frequency of the carrier-wave would be approximately 825,000 cycles.

Just as a violinist tunes his instrument, that is, makes a certain string emit a note of higher or lower pitch, or, technically speaking a sound wave of higher or lower frequency, by adjusting the tension on the string, so may the electrical constants of the antenna circuit of a radio transmitter be changed in order to have the station emit a carrier-wave of a different frequency.

If a tuning fork having a natural period corresponding to middle C is piped near a violinist who is playing the fork will vibrate when the musician plays middle C, but all other times it will remain quiescent. This phenomenon of the tuning fork vibrating whenever the musician plays the corresponding note on the violin is known as mechanical resonance. If a radio receiver be adjusted so that electrically its natural period of vibration will be 825,000 cycles (300 meters wave-length) every time a station transmits on a wave-length of 300 meters, current will be set up in the receiver by

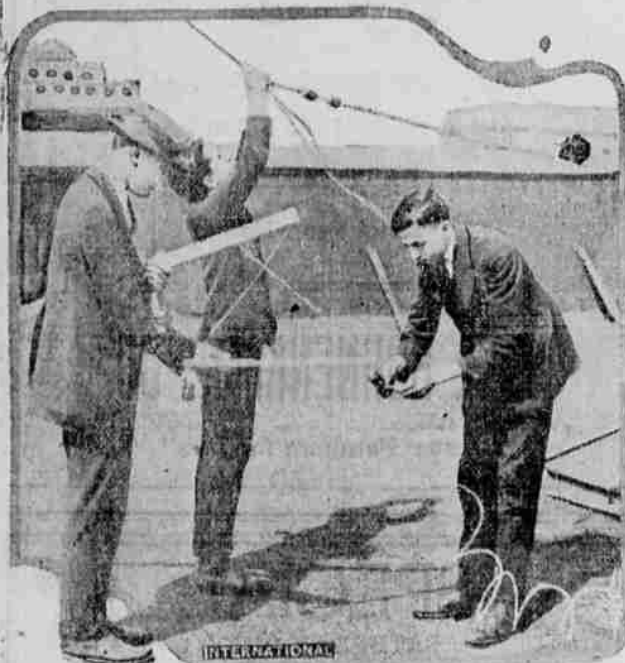
electrical resonance. Stations transmitting on any wave-length other than 300 meters will not cause a current to be set up in the receiver.

The portion of a radio receiver that changes the wave-length at which it is electrically resonant is called a tuner. Suppose that "A" station transmits on a wave-length of 300 meters and "B" on a wave-length of 360 meters. By adjusting the tuner until the constants of the receiver make it electrically resonant to a 300-meter wave or a 360-meter wave, either of the two stations can be picked up, but both stations cannot be picked up simultaneously. This is the reason that more than one transmitter can be operating at one time and yet only one can be heard on a receiver without interference from the others.

The other necessary part of a radio receiver is the detector. The function of this portion of the receiver is to utilize the small currents in the tuner that are set up by a transmitting station and make them audible through the medium of a telephone receiver. If the telephone receiver were connected directly to the tuner the high-frequency current would not operate the diaphragm of the receiver and even if the diaphragm were set in motion it would be too fast a motion to be picked up by the human ear.

In a simple receiver the detector usually consists of two pieces of mineral in contact or a piece of mineral in contact with a metallic spring. Either combination is known as a crystal detector. A detector of this type is nothing more than a rectifier; that is, when an alternating current is applied at the terminals the current is allowed to flow only in one direction.

In a radio receiver there are two requirements that must be fulfilled. First, there must be a source of high-frequency current, say, between 25,000 and 1,500,000 cycles as connected to an antenna and ground system that energy in the form of electromagnetic waves will be radiated. Second, there must be some method of controlling this high-frequency current or modulating it so that the variations in the amplitude of the high-frequency current will be directly proportional to the voice or music to be transmitted.



Amateur Radio Operators Erecting Aerial on the Roof.

field about the tips of the magnet and this same kind of a field propagates the electro-magnetic force, except that unlike the toy magnet, its power comes off in the form of wavy motions. This electro-magnetic force propagates radio energy in all directions.

The medium that transmits the electro-magnetic waves is the same medium that transmits light—the ether. This medium is supposed to fill all space, even that occupied by fluids and solids. Little is known about its properties.

In radio it is more common to speak of wave length than frequency. The wave length of any wave motion is the distance between any two successive crests in the same direction. The wave length depends upon the frequency. If the frequency is high the wave length is short. On the other hand if the frequency is low the wave length is long. Numerically the wave length is equal to the distance traveled by the wave in one second divided by the frequency. Suppose, for example, that it were desired to know the wave length of an electro-magnetic wave having a frequency of 825,000 cycles. Electro-magnetic waves travel at the same speed as do light waves, that is, 186,000 miles per second. Dividing the 186,000 by 825,000 the wave length would be 223 miles or 360 yards. In radio work it is measured in meters. A meter is equal to approximately 1.1 yards. Converting 360 yards into meters the wave length would be 330 divided by 1.1 or 300 meters. This is the wave length on which KDKA operates. It also means that the electro-magnetic waves sent out from this station have a frequency of 825,000 cycles.

FUNDAMENTAL PRINCIPLES

In a radio receiver there are two requirements that must be fulfilled. First, there must be a source of high-frequency current, say, between 25,000 and 1,500,000 cycles as connected to an antenna and ground system that energy in the form of electromagnetic waves will be radiated. Second, there must be some method of controlling this high-frequency current or modulating it so that the variations in the amplitude of the high-frequency current will be directly proportional to the voice or music to be transmitted.

Worthy Achievement.
To get on to satisfy one's equals...
Japanese Dots With Each Hand.
Japanese children are taught at an early age to write and draw with both hands, and to this fact has been accorded the superiority of Japanese art in certain directions, especially in case of...

Churches

All church notices must be in the hands of the editor by 4:00 p. m. on Friday.

First Methodist Episcopal Church.
—Sermon topics will be as follows: In the forenoon service, "The Crown of Christian Duty," and the evening hour, "A Vision of a World Without Christ." Mrs. Aldrich and Mr. Sherwood-Williams will be heard in a duet Sunday morning. Commencing next Sunday the evening service will open at eight o'clock. Epworth League hour will be changed from 8:30 to 7. Please take notice. Bible school at 9:45. The attendance last Sunday was quite gratifying, please keep it up. Claude Cooper, superintendent.—G. H. Quigley, Minister.

St. Peter's Episcopal Church.
—Corner Fourth street and O avenue. Calendar for the week beginning May 7th, the 3rd Sunday after Easter. We have the usual Sunday services. Early communion, 8 a. m.; church school, 9:45. The regular monthly celebration of the Holy Communion, 11:00 and evening prayer, 7:30 p. m. All are cordially invited. Sermon topic at the morning service will be "Fitting the Deed to the Plan." We are anticipating a visit in about two weeks from Bishop Wells, of Tacoma, in place of our own Bishop Paulick. He will confirm those prepared at that time. Let us unite and work on the interest we can.—Jos. W. Gunn, Rector.

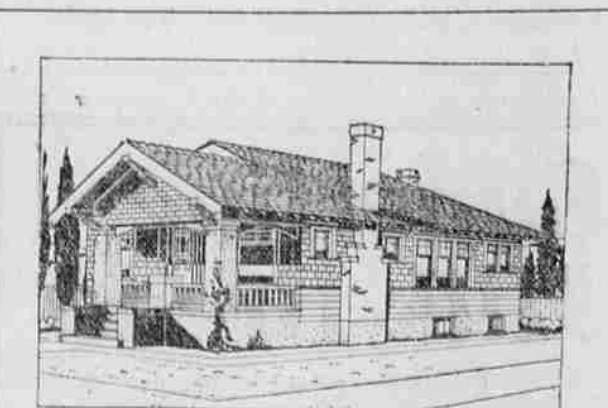
Presbyterian Church.—Sunday School at 9:45. There will be no services at 11:00 or 7:30. Our new pastor, Rev. W. C. Ross, will arrive next week and will conduct the regular services the following Sunday, May 14th.

First Church of Christ, Scientist.
—Corner of First and Washington, Sunday morning service at 11 o'clock. Subject, "I Am and Fallen Man." 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.

Latter Day Saints.—Regular services at the Tabernacle. Sunday school commences at 10:30 a. m. Sacramental services, 2 o'clock p. m. Mutual Improvement Association, Sunday at 7:00 p. m. Teachers' training class, Monday at 7:00 p. m. Priesthood and Relief Society meeting at 7:00 p. m. Primary association at the tabernacle Tuesday, for children, 4 p. m. Primary association on north side at the little chapel, 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. Regular Fast Day services at 2 p. m. the First Sunday of each month. The public is cordially invited to attend any or all of our services.—David L. Stoddard, Bishop.

FREE AEROPLANES.
On Monday at four-thirty we will give away 500 planes to the boys and girls calling at our store.
5-5-24 J. G. SNODGRASS.

NOTICE.
Dr. Ralston has moved his offices into the New Foley Building, third floor.
4-29-7



Is Your Home Fly-Proof?

It won't be long until the pesky flies will be swarming into your home. Better tell us to come over and get measurements and let us fit up your house with

Window and Door Screens

All standard sizes are carried in stock, but if you need any special sizes we can make them to order. We also have the material on hand if you desire to make your own door and window screens. Give us a ring today

The Grande Ronde Lumber Co.

Heroine a Bride



Heroine a Bride. Miss Silverer, mad a niece of the Order of Leopold by King Albert for war services, will be married in Brussels to Henry W. Silverer, New Haven, Conn., formerly a captain of U. S. Field Artillery.

BONUS SPIRIT IS DEFEATED

SALEM, May 6.—Contending that the spirit of the bonus loan is defeated by the refusal of the bonus commission to extend loans to ex-service men up to 75 percent of the appraised value of property offered as security, attorneys for the Salem American Legion post presented their arguments for a writ of mandamus against the bonus commission before Judges Bingham and Kelly of the Marion county circuit court here Wednesday.

The case came to issue on a do-murrer filed by the attorney general in reply to the complaint filed by the legion post. The case has been taken under advisement. In order to test out the situation which is said to apply to more than 200 cases in the section, the Legion post has filed mandamus proceedings against the bonus commission to compel the extension of a loan equivalent to 75 per cent of the appraised value of the property offered as security by Edwin Stephens Woodford, a Salem ex-service man. The commission had allowed a loan of only \$1000 to Woodford, who had applied for a loan of approximately \$2100, based upon the valuation of his property as fixed by the board of appraisers for Marion county, appointed by the commission.

Analysis of the Kiss.
In analyzing the psychophysiology of the kiss, Professor Malespine says: "The kiss is the first physical manifestation of love. The passionate look is nothing but desire. The handshake is full of reserve, of constraint, or full of hope. The kiss is simply mother and more exquisite manifestation of the sense of touch than the handshake. And it is from the sense of touch that all other senses are derived."

WOOL PRICES SATISFACTORY

PENDLETON, May 6.—Prices for wool being paid here range from 30 to 35 cents a pound, with the lower price being offered for coarse and half blood wool. About one half of the entire Eastern Oregon wool clip already has been sold. The prices being paid are said to be satisfactory to the growers.

Sheepmen no longer are confronted with a strike of shearers. Ten days ago a strike was attempted but the Oregon Wool Growers association took up the cudgels for the sheepmen and soon men were obtained who would shear at 10 cents a head. There is now a surplus of shearers.

The K. G. Warner clip sold for 35 1/2 cents and the Enterprise clip of Dave Michelino went at the same figure. The Cunha clip at Echo went at the top price. Shearing in this section is about one-third completed. The wool is of a better grade than that of 1921, but it is said that the fleeces are not so heavy as in other years.

Hydrogen in Atmosphere.
The Bureau of standards says that hydrogen occurs in the atmosphere to some extent. This is the lightest gas known. The second lightest gas, helium, also occurs in small amounts. Nitrogen is the lightest gas occurring in sufficient quantities to materially affect the density of the air.

Spring Cleaners

—Renovate, clean and dye your faded and soiled garments. Save money and have a new wardrobe.

Cleaning Compounds
Spot Remover
Diamond Dye
Aladdin and Twink
Soap Dyes
Shoe Cleaners
Moth Balls

L. & L. DRUG CO.
"Try the Drug Store First"

--We Offer--

- A Fine Home in very choice location. House has 5 rooms, bath, good furnace, fire place, good garage. \$4000.00.
- A modern home of 5 rooms and an attic that can be made into five rooms, full basement, fire place, furnace, new garage. \$2600.00.
- A 6-room house, old but good modern, has 2 lots, good location, \$500.00 cash, balance \$35.00 per month. \$3,000.00.
- A good home, 5 rooms, bath, cement cellar, woodhouse, garage, 2 good lots. \$2,845.00.
- Good 4-room house, small lot, in good location, city water in house, house in good repair. \$1,000.00.

Vacant lots at prices to suit you. Come in and see.

La Grande Investment Company
1113 Adams Ave. Phone Main 752

Attention!

If you have any cement work you want done why not try
O. O. JOHNSON
Phone 259-W

"BILL" HANSEN
Contractor and Builder
Brick, Stone, Tile and Concrete Work

Remodeling and general contracting. No job too large, none too small. No war-time prices. 35 years' experience. See me before you let your work.
1102 N. St. Cor. N & 5th

All Pine Mill Wood

Lay in your winter's supply now, while you are able to get it. \$3.50 per load.

THE GRANDE RONDE LUMBER CO.



SEE THE BEAUTIFULLY DESIGNED PERIOD MODEL BRUNSWICKS

Queen Anne, at \$235.00
Colonial, at \$260.00
Stratford, at \$310.00
Cambridge, at \$360.00
Oxford Electric, at \$575.00

And All Upright Models from \$65.00 up

Eastern Oregon Music Company
A small payment down will send one to your home

LA GRANDE IRON WORKS

MACHINE SHOP AND FOUNDRY
All kinds of machinery, automobiles and tractors repaired, overhauled and rebuilt.
Acetylene welding of all kinds.
Cylinder boring and oversize pistons.
Crankshafts, Pistons and Piston Pins reground.
Give us a trial
D. FITZGERALD, Prop.

Furniture Exchange

COMPLETE HOUSE FURNISHERS
ED DONOHUE, Prop.
Phone, Black 1241 Fir & Jefferson

Turn the Corner and Save a Dollar

- 10 Pound sack Hominy 35c
- 10 pound sack Corn Meal 35c
- 10 pound sack Pancake Flour 78c
- 9 pound sack Oats 65c
- 10 pound sack Flour 55c
- 10 pound Graham 55c
- 10 pound Germs 55c
- 10 pound Rye 55c
- Jasper's Graham 30c
- Jasper's Health Nuggots 38c

J. G. HOLM
GROCER
Quality and Service
—FREE DELIVERY—
CALL MAIN 43