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 electro-magnetic 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 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.

Amateur Radio Operators Erecting Aerial on the Roof.

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 835,000 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 835,000 the wave length would be .223 miles or 396 yards. In radio work it is measured in meters. A meter is equal to approximately 1.1 yards. Converting 396 yards into meters the wave length would be 396 divided by 1.1 or 360 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 835,000 cycles.

FUNDAMENTAL PRINCIPLES

In a radiophone transmitter there are two requirements that must be fulfilled. First, there must be a source of high-frequency current, say, between 15,000 and 1,500,000 cycles so connected to an antenna and ground system that energy in the form of electro-magnetic 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.

The high frequency current is known as the carrier-wave and its function is to radiate into space in the form of electro-magnetic 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 radiophone station is transmitted. By experiment it has been found that electro-magnetic 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, a 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 electro-magnetic wave is equal then to 300,000,000 divided by the frequency. Suppose a station was transmitting on a wave-length of 360 meters. The frequency of the carrier-wave would be approximately 835,000 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 radiophone 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 be placed 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 835,000 cycles (360 meters wave-length) every time a station transmits on a wave-length of 360 meters, current will be set up in the receiver by electrical resonance. Stations transmitting on any wave-length other than 360 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 200 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 200-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.

How One Editor Uses Radio.

The editor of a paper in an isolated town in the northwest is using the radio in a most ingenious and effective way. An aamateur radio friend in a big city 50 miles away buys the latest editions of the city papers as soon as they are off the press, reads the best news into his transmitter, and a typist in the country office copies the news as it comes in over the office receiver. The editor, through this ingenious plan, is always "First With the Latest" in his home town.

COL. WHITE BOOSTS FOR DEVELOPMENT

Adjutnat General Geo. A. White, head of the National Guard of Oregon and who has announced himself as a candidate for election to the position of governor at the coming primaries, is not a man of words, believing rather in action. Those who heard him speak at the meeting Friday night were impressed with the unassuming but serious way with which he treated his subject; and he certainly did not appear to be the trained politician that is usually expected to be after the governor's chair.

In brief Colonel White's platform is as follows: Less state expenditure; consolidation of commissions; immediate plans for retiring state's indebtedness; control Japanese ownership of land; stimulate progress in Oregon.

Colonel White has nothing in his published platform definitely concerning the Roosevelt highway, but he confided his ambitions for this project in the ear of a reporter later.

"I've traveled over nearly all the coast country from the Columbia river to the California line", said Colonel White, "and I've never seen a country so rich in natural resources any place else. The Roosevelt highway would open this vast amount of undeveloped country to the world."

"There is another aspect of the situation that also interests me. That is the valuable aid such a highway would give to the military preparedness program of the government", continued the Colonel.

Contrary to some belief, Colonel White is not trying to use his service in the army as a drawing card for votes. "I wish people would forget that I ever was in the army", said he, "I ask support simply on my reputation as an executive and no more."

"HELLOFF" IS POSTOFFICE IN NORTHERN TILLAMOOK

The west is celebrated for its singular nomenclature. The state map is shot over with all kinds of ridiculous names. The Indian names are all right and ought to stay. They leave a pleasing impression on the stranger, but such names as "Hell's Half Acre", "Louse Creek", and similar names of localities, hamlets and towns, are, to say the least, undignified, when we come to consider them in the light of state pride.

"Helloe"is a struggling little settlement about seven miles south east of Mohler, and a man has been found who claims to have knowledge of the origin of the name which the postoffice department at Washington has established as the government name of the hamlet, although it has another name, Snark. The man who bestowed the name Snark, evidently was a reader of Jack London's fiction probably didn't like the name "Helloff". In fact, there seems to be a sort of neighborhood one spring in the early name shall stick. To return to the origin of "Helloff". The story goes that a German walked into the neighborhood on spring in the early days, looking for a stray homestead to settle upon. All day he walked up and down hill, following a dim trail, and the yellow soil cling tenaciously to his boots and the rain soaked him to the skin. Long towards evening, he came to a settler's home where he was put up for the night. The next morning he was asked how he liked the settlement. "Veil", replied the Teuton, as he gazed meditatively down the rainy trail,"de most what" I can say about it is, its vun helloff a goundry... Hence the name.

CARD OF THANKS

We wish to thank the friends and neighbors for their kindness and sympathy, also for the beautiful floral offerings during the sad bereavement of our loving wife and mother.

W. N. Dye and family, Mrs. O. W. Kinnaman and family, Mary Dye and family.

NOTICE OF CONTEST

DEPARTMENT OF INTERIOR
United States Land Office
Portland, Ore., Apr. 6, 1922.

To Heirs of Albert R. Batchelder, deceased, of Blaine, Oregon, Contestees:

You are hereby notified that Clarence B. Chappell, who gives Blaine, Tillamook County, Oregon, as his post-office address, did on March 15th, 1922, file in this office this duly corroborated application to contest and secure the cancellation of your Homestead Entry No. 06473 Serial No. 06473 made September 25th, 1919, by Albert R. Batchelder, deceased, for NE¼ of SW¼, SE¼ of NW¼, and SW¼ of NE¼, Section 4, Township 4 South, Range 7 West, Willamette, Meridian, and as grounds for his contest he alleges that said Albert R. Batchelder died in the State of Oregon on or about the 23rd day of October, 1920; that at the time of his death he was not engaged in the military or naval service of the United States during any war in which the United States was engaged; that since he made said entry on September 25th, 1919, he had not been engaged or employed in the military or naval service of the United States; that he never served in the military or naval service of the United States during any war in which the United States was engaged; that he never made settlement on said land or resided thereon before he made said entry; that he lived on said land less than one year after he made said entry; that he did not comply with the law so as to entitle him to a patent for said land, and his default therein was not due to his employment in the military or naval service of the United States; that his heirs are unknown and their places of residence are unknown to contestant and after due and diligent inquiry said heirs or their places of residence cannot be found by him; that none of said heirs has ever resided on said land or improved it or cultivated any part thereof, and they have wholly abandoned said land for more than six months immediately preceding the begining of this contest; that more than one year has elapsed since the death of said entryman; that the absence of said heirs from said land and their failure to improve or cultivate said land is not and was not due to their employment in the army or navy of the United States during any war in which the United Staes has been engaged.

You are, therefore, further notified that the said allegations will be taken as confessed, and your entry will be canceled without further right to be heard, either before this office or on appeal, if you fail to file in this office within twenty days after the FOURTH publication of this notice, as shown below, your answer, under oath, specifically responding to these allegations of contest, together with due proof that you have served a copy of your answer on the said contestant either in person or by registered mail.

You should state in your answer the name of the post office to which you desire future notices to be sent to you

Alexander Sweek, Register
Frank O. Northrup, Receiver
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