Inventor of Telephone Sees Radio Future

RADIO

Editor's Note: The following article on local radiophone problems was prepared especially for the Headlight by W. L. Thrailkill of Bremerton, Wash. Mr. Thrailkill was in the city for several weeks and while here studied the local situation thoroughly.

Probably the first thought that comes to the beginner radio enthusiast is: What am I going to receive with a set if I get it? A few examples follows:

California has several large broadcasting stations located in San Francisco and Los Angeles. Washington has several in Seattle. Oregon has several in Portland.

Any of the high power broadcasting stations located in the above cities should be easily picked up by any medium-priced sensitive short wave regenerative receiver (tuner). Unfortunately, however, if mountains lie between your receiving station and the broadcasting station, signals will be very much weakened due to the reflecting properties of hills and mountains containing mineral. Radio magnetic waves are known to be subject to reflection from metallic surfaces similar to the reflection of the sunlight from a mirror.

Portland, unfortunately, is located in somewhat of a pocket being almost entirely enclosed by mountains. Thus Portland radio enthusiasts have not been able to receive radiophone broadcasts from outside stations. Although Portland has broadcasting stations equal in power to California and Seattle stations, they cannot be heard as distinctly in Tillamook as the latter stations which are hundreds of miles more distant.

Tillamook is also located in somewhat of a pocket opening out on the bay. It has the advantage though of being very near the ocean, over which radio waves travel very rapidly. Therefore since California and Washington broadcasting stations are situated on the coast, they are very easily picked up by local rdio amateurs.

Another problem which radio enthusiasts have to contend with is an atmospheric disturbance caused by the apparatus installed at the Bell telephone exchange to furnish a low frequency A. C. current for bell ringing. This condition, however, will only be temporary, as Portland telephone engineers are now working to overcome this and success is soon expected. In the meantime, however, the local manager has been very considerate, disconnecting the apparatus when requested by local amateurs.

The next question arising before the beginner is, "what kind of an antenna (aerial) should I have to receive Radiophone concerts?" This is easily built because the most simple form of antenna is the cheapest and as good as the larger and more expensive type. For short wave reception, as radiophone, a single wire between 75 and 150 feet long with suitable insulators on each end, stretched between two masts from 25 to 100 feet in height makes an excellent antenna. A single wire antenna for receiving has been proven to be equally as good as several wires. As for the heighth of the antenna, the higher the better, but one must take into consideration that the lead-in, or wire leading from the antenna to the receiver, forms a part of the antenna and should be taken into consideration in figuring the distance between masts. The current in the receiving antenna being very, very small makes it unnecessary to use stranded wire. Radio frequency currents travel on the surface of conductors, therefore, it is quite essential that broadcasting stations use stranded wire in order to keep the high frequency resistance at a minimum as the amount of current in the antenna is rather large. Several wires, instead of one wire, are used for the atenna of the broadcasting station to obtain greater radiation, thus resulting in higher efficiency. For receiving aerials though, a single bare copper wire of about No. 14 or 12 guage has proven very satisfactory. In putting up the antenna, it is well to remember that the free end of the antenna (or the end opposite that to which the lead-in is attached) should point in the opposite direction to that of the broadcasting station which you wish to receive best.

The next question arising in the mind of the amateur probably will be: What will my receiver (tuner) cost and what kind should I get? The first part of the apparatus to be considered is the detector or rectifier, this being the heart of the receiver. As explained in a previous issue of this paper, the radio frequency signals must be rectified or changed to a frequency that will be audible to the human ear through the medium of the head-set or loudspeaker. This is the function of the detector. There are two distinct classes of detectors, the crystal detector and the audion detector. The crystal detector is sufficiently sensitive if the receiving station is located very near the broadcasting station, but for distant reception, the audion detector is by far superior. It has the decided advantage of allowing amplification of the signals after being detected by means of the so-called feed back connection of detector and tuner. This circuit is patented and tuners cannot be manufactured for sale with this form of connection unless licensed. This circuit is called the Armstrong regenerative circuit, Armstrong being the name of the man who patented it. All tuners that are regenerative use this circuit.

The next important part of the apparatus to be considered is the turner. For distance reception the regenerative type of tuner is highly recommended, any other type will not give sufficient strength in this locality. The regenerative tuners are generally classed under two heads, the single circuit regenerative tuner and the coupled regenerative tuner. The coupled type is better liked among radio fans because of its selectivity. Interferance from stations sending at different wave lengths is far more easily tuned out with this type of tuner than with thee single circuit type. On the other hand, the single circuit regenerative tuner has the advantage of being simpler to tune to the desired wave length and is for this reason often preferred by many people. It also has the advantage of being cheaper in cost. The form of coupled regenerative tuner most commoniy known, is the variometer type tuner. This type of very efficient as it has very little capacity in the circuit thus giving greater signal strength.

Another question asked by many radio enthusiasts is: "How loud will the music or voice be?" This is determined largely by the amount of money the radio fan is willing to spend for his set. Any more than three steps of audio frequency amplification does not work very satisfactorily using the standard commercial audio frequency amplifying transformers. To optain any greater signal strength it is necessary to use radio frequency amplifiers which are very successful for receiving distant broadcasting stations. At present radio frequency amplifiers are not very much in use due to their very recent development for short wave reception and also to the scarcity of material for construction. For conditions in and around Tillamook, three steps of audio frequency amplification together with some form of loud speaker, such as Magnavox, gives signals sufficiently loud to be heard distinctly in a large room or hall, and probably sufficiently loud to dance to the music in a medium sized hall.

Local electrical dealers are now carrying a stock of radio supplies and sets. Owing to the great demand for material they have not been able to get all they would like to have, thus their stock is rather limited. However an opening of the market is soon expected.

DAIRY FACTS

BETTER COWS HELP PROFITS

High-Producing Dairy Animals Make Best Market for Different Home-Grown Feeds.

Hundreds of millions of dollars' worth of feed is consumed annually by our dairy cows. The net income is large or small, according to the way that feed is used. When production is increased through feeding and breeding, the income rapidly expands, yet a few real scrubs on any dairy farm will deflate the net income.

Farmers of the United States furnish feed and care for 23,000,000 dairy cows. Because of low-producing cows a large part of that feed is wasted. Weighing out expensive feeds to a low-producing cow is like shoveling costly coal into the fire box under a leaky

Like a Factory, the Dairy Cow Transforms Raw Materials Into the Finished Product—Milk.

boiler; and the farmer who keeps such cows seldom has to pay any income tax.

Like a factory, the dairy cow transforms raw materials—silage, hay, and concentrates—into the finished product, milk. In this way she furnishes a market for the feeds. Whether that market will be good or bad depends in part upon the way the cow is fed, and in part upon the cow herself. There is no better way to market the feeds grown on the farm than to feed them to a herd of high-producing dairy cows. The cow takes corn silage, grain, and hay and converts them into a product for which there is always a ready sale.

It is much easier to send the milk or cream to the creamery than to haul the hay to town. In the long run it is generally much more profitable, because it keeps the soil fertility at home.

In selling feeds to dairy cows the farmer has a wide choice of markets—bad, good, and very good. Few men discriminate closely enough between these markets. If a wheat buyer offers 1 or 2 cents a bushel more than other buyers he gets the wheat; if a wool buyer offers half a cent a pound more he gets the wool. But if one cow returns $3 from a dollar's worth of feed and another only $2, it is scarcely noticed. There is a difference of a dollar in the income every time each of these two cows eats a dollar's worth of feed.

According to estimates of the United States Department of Agriculture, the average dairy cow in the United States produces annually about 4,000 pounds of milk and 160 pounds of butter fat. According to 40,000 yearly individual-cow records recently tabulated by the department, the average cow testing association cow produces 5,980 pounds of milk and 246 pounds of butter fat a year. The world's records are 37,381.4 pounds of milk and 1,205.09 pounds of butter fat in a year. There is plenty of room for improvement, it would seem, in the average production.

The keeping of individual cow records is easy. To test a half dozen samples of milk for butter fat requires about half an hour. Weighing the milk, estimating the weight of roughage, and weighing the concentrates requires but little time. The testing of a composite sample of each cow's milk from two consecutive milkings once a month furnishes the figures from which the yearly production records can be computed. Any man competent to care for a dairy herd can easily learn to make the butter fat test and to keep feed and production records.

WINTER FEEDS FOR HEIFERS

Young Animals Should Not Be Compelled to "Rough It" During Cold Weather Period.

Young heifers should not be expected to "rough it" during the winter, but should have feed and shelter. The feeds should of course include bulky feeds, such as silage, stover, hay, fodder, etc., and concentrates. The young animals should have enough such concentrates as cottonseed meal, wheat bran, shorts, rice flour, alfalfa, pea hay, peanut hay to develop body.

Practice of Testing Cows.

The practice of testing cows to determine their milk and butter fat production and feed consumption by means of cow-testing associations has become widespread. There are now 452 associations of this kind in the United States.

Cracking Velvet Beans.

Velvet beans, as a dairy feed, are improved by cracking, soaking and grinding. Cracking alone does not pay for the work of doing it, but grinding did, in a feeding test in Texas.