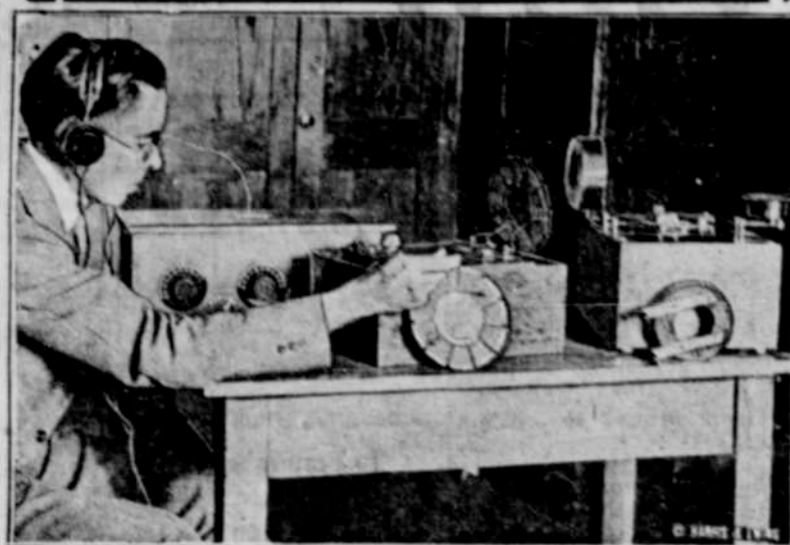


RADIO



Morris S. Stock of the Government Radio Laboratory Has Designed and Built an Apparatus to Measure Frequencies of Stations.

With short wave radio transmission now emanating from practically every corner of the earth, a tremendous interest in this form of communication is being predicted for this summer.

According to the most recent list of the world's short-wave stations there are approximately 130 transmitters operating on regular schedules on wave lengths between 13 and 115 meters. The total is expected to be almost doubled by the end of the year.

The United States maintains the lead in the short-wave stations, principally through its naval transmitters and the experimental stations of the low-wave pioneers among the radio manufacturers.

United States Leads.

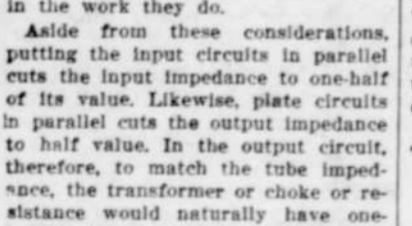
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Included in the list of stations on low waves are transmitters located in Germany, England, Java, Sweden, Holland, Russia, France, Hawaii, Samoa, Canal Zone, the Philippines, Japan and aboard the ships of the United States fleet scattered throughout the world.

Parallel Tubes Reduce Impedance; Aid Output

In various set building experiments going on there appears to be an inclination toward the use of parallel tubes, that is, two tubes with their grids connected together to the input and their plates connected together to the output circuit.

An aerial is not essential with a sensitive set employing two stages of radio frequency amplification. When using the variocoupler as a single circuit set reverse the tickler connections if it will not oscillate.



System That Reduces Impedance and Improves the Output.

At the same time, both plates, being connected together, are at the same voltage at the same instant. But an essential in smooth action is that both tubes must be alike, which seldom happens. It is the same situation with a team of horses. Unless they are matched there will be a difference in the work they do.

Aside from these considerations, putting the input circuits in parallel cuts the input impedance to one-half of its value. Likewise, plate circuits in parallel cuts the output impedance to half value. In the output circuit, therefore, to match the tube impedance, the transformer or choke or resistance would naturally have one-half the impedance it had when matching a single tube.

Coils Set Far Apart—Selectivity Improved

Listeners desiring to "tune in" on stations emitting a sharp wave will need to use more care in their tuning than would otherwise be necessary. Especially is this true of a modern type of tuned radio-frequency, neutralized, or superheterodyne type of receiving set. In order to secure the best results possible from any receiving set, no matter which type is used, the operator must become thoroughly familiar with its operation.

The use of a "C" battery improves the quality of reproduction and reduces the plate current drain on receivers using more than ninety volts of "B" battery. It is connected in the grid circuit of the amplifier with the positive terminal connected to the "A" battery.

Use of Tubes Counts

Many people believe the more tubes a radio has the better it is. This is not so. It is the way the tubes are used that counts.

ROAD BUILDING

BIG JOB DONE ON MINNESOTA ROADS

To transport the surfacing materials used by the Minnesota department of highways during the years 1921 to 1925, inclusive—beginning when the new state highway program took full effect—would require 3,228 trains of steel hopper cars extending a distance of 1,541 miles. Charles M. Babcock, chief of the department, in a recent statement, said that the department has built 3,575 miles of gravel surfacing and 575 miles of paving in addition to extensive bridge construction and replacement and maintenance operations over the entire 7,000-mile highway system.

Material involved in the state highway department's surfacing activities during the five-year period mentioned totaled 6,704,000 cubic yards of dry materials, or 9,684,000 tons. To transport this vast quantity would have required 138,000 steel hopper cars of a capacity of 50 tons each.

The department built 575 miles of pavement and there entered into it 1,847,000 cubic yards of material, or a quantity sufficient to construct a wall 472 miles long, 10 feet high and 2 feet thick. This wall would extend from St. Paul to Winnetop.

The department has used for various purposes 352,983 tons of cement, \$34,428 tons of sand and 1,335,086 tons of aggregate—gravel or crushed rock. The cement, gravel and crushed rock entered not only into paving but construction of bridges and culverts. Altogether there were 82,581,000 cubic feet of dry materials, and these made 1,362,000 cubic yards of concrete.

All this work was on the state-wide system of trunk highways serving by one or more routes all county seats and nearly all towns of more than 1,000 population. Placed end to end these routes would make an oval line around the outside of the entire United States and the improved mileages would cross it once on both its shortest and longest diameters.

Bridges Very Important in Any Highway System

Bridges are a necessity to the highway system of the world. But bridges may be detrimental to a degree, as well as helpful, says Good Roads. Bridges may be classed in several groups; the long and the multi-span bridge over rivers; the single span short bridge over creeks and drainage systems; the small single span bridges over culverts; all bridges, but of varying construction and design.

Very little criticism may be found in the long multi-span bridges, such as are found over our larger streams. The motorist will naturally slow up when approaching such a structure, as he can see it and will take the necessary precautions to pass over it safely.

Such mechanical details as approaches, road width, visibility on approach are, as a general rule, pretty well taken care of. There are fewer accidents by far on a bridge of this type than on the small, half-hidden, narrow bridge, such as lines our highway system at intervals of every few hundred feet.

The small creek bridge and the culvert bridge both offer hazards to the traveler that are both unnecessary and preventable, many of these small bridges, being of a width much too narrow for the modern highway. The abutments, or bridge rails, will extend as much as two and often three feet into the road right of way.

Highway to Science

An important new development in highway engineering is the certainty with which it can be determined just when traffic reaches the point where a paved road will be more economical than a dirt or gravel road. It is now even possible to determine even the type of pavement and the design which will give the taxpayers and the highway users the best value.

Good Roads Facts

Good roads bring rich returns. A bad road is a big handicap to a good community. Utah will build 116 miles of road in 1926, according to the state road commission. This construction will cost nearly \$1,000,000. The money is largely from the counties supplemented by federal aid.

Highway construction and maintenance in 1926 will equal and possibly exceed the progress made in any other year, according to estimates from the various states compiled by the United States bureau of public roads.

The Nevada department of highways has issued a report on the present condition of the Lincoln highway in that state. It shows that 194 miles of the route, practically 50 per cent of the mileage, are complete.

Boston is planning an extensive system to relieve traffic congestion in the busy downtown district. The plan is to construct several main highways 100 feet wide to take care of the principal automobile traffic. Such a plan would cost the city \$50,000,000.

The United States is now credited with building the finest highways in the world. Plans are being made for the construction of a "three-fingered" national highway to be known as the Great South way. The highway would have sources at Detroit, Minneapolis and Omaha passing through Chicago and converging at Terre Haute, Ind., thence through Kentucky, Tennessee, Alabama, and Florida to its southern terminus at Key West.

Coolidge Meets Highway Contest Winners



Winners in the contests conducted by the highway education board were congratulated by President Coolidge when they called at the White House and were presented by Capt. Eddie Rickenbacker. In the group, left to right: Senator Shipstead of Minnesota; Miss Elsie Green, school teacher, whose safety lesson was the best of 30,000 submitted; Dorothy Jenn Utley of Bemidji, Minn., winner of the school children's essay contest; President Coolidge; Harold Haswell of Hooisick Falls, N. Y., winner of the contest among children of members of the National Grange; and Captain Rickenbacker.

Airview of New Jersey Forest Fires



Airplane view of one of the devastating forest fires that have been sweeping the northern part of New Jersey.

Two Senators Learn They're Related



Two prominent members of the senate, bearing the same name but bitter political opponents, have just discovered that they are cousins. They are David A. Reed, Republican, of Pennsylvania (left) and James A. Reed, Democrat, of Missouri (right). They are both descended from David Reed of Washington county, Pennsylvania, a friend of George Washington.

Part of Great Estate Is Theirs



Mrs. Amanda Mosher Layton Williams, seventy-one years old, of Trenton, N. J., and her son, Joseph Layton, a motorman, have just learned that they are to inherit a part of a \$32,000,000 estate left by Ezekiel Mosher, who died recently in England.

Small Farm Profits in Southern Illinois

Urbana, Ill.—Farmers in two different sections of southern Illinois last year got less than an average of \$1,000 each for their labor, risk and management in connection with the college's farm account project averaged \$623, while 30 account-keeping farmers in the second section, which takes in Montgomery, Macoupin, Bond and Madison counties, realized an average of only \$913 for their labor and management. These earnings undoubtedly are above the general average for the rank and file of all farmers in the two sections, the farm management department points out.

POULTRY FACTS

FEEDING TURKEY POULTS PROPERLY

It is very poor economy to stint turkeys, especially young growing stock; for when once stunted, it takes a long while to recover. For the first 24 hours after the chicks emerge from the shell they should remain under the hen unimpeded, both to dry and gain strength and hardiness. They do not require any food, as the store nature provides will last over half time. As the chicks hatch sometimes irregularly, the older ones can be cared for in the house until the others are ready to be taken away, when the hen and her brood can be removed to a roosting coop, with a tight board bottom and rain-proof roof. They should be fed five times daily, but just what they will clean up. The first food should consist of stale bread moistened in water or in fresh milk—the milk is preferred. Do not wet the food, a very moist or sloppy food will cause sickness and a high rate of mortality among young turkeys. If milk can be spared, give it to them freely in place of water.

The too lavish use of corn meal has caused more deaths among young chicks than has cholera among grown fowls. Until the chicks are half grown, corn meal should be but sparingly fed; but after that time, when judiciously used, is one of the very best and cheapest foods for fowls and chicks. Nine-tenths of the young turkeys which die when in the "downy" state get their death-blow from corn meal, as it is a very common practice to merely moisten with cold water some raw corn meal and then feed it in that way.

Young chicks relish occasional feeds of cracked wheat and wheat screenings; while rice, well boiled, is not only greedily eaten by the chicks, but is one of the very best things that can be given. It frequently happens that damaged lots of rice, or low grades of it, can be bought at low figures in the cities. As it increases in bulk in cooking, it is not an expensive food for young chicks even at the regular retail price, though it would not ordinarily pay to feed it to full-grown fowls very liberally or very frequently. In the absence of worms, bugs, etc., during the early spring, cheap parts of fresh beef can be well boiled and shredded up for the little chicks; but care must be taken not to feed more frequently than once in two days, and only then in moderation. Feeding meat is very beneficial to young turkeys when they are "shooting" their first quill feathers, as then they require extra nourishment to repair the drain on immature and weakly bodies.

Youth and Age Will Not Mingle Well in Flock

Conditions fatal to profits are developed in the poultry flock by allowing youth and age to mingle indiscriminately in the run and houses, according to Prof. L. F. Payne, head of the poultry department at the Kansas State Agricultural college. "If the pullets are fed enough for growing purposes," he explained, "the hens become fat and sluggish and if the hens are fed just sufficient to lay well the pullets starve."

Poultry Facts

- Green feed is very essential in stimulating egg production.
- Early-batched chicks will get a good start before hot weather and mature before winter.
- Raising chicks on fresh ground away from the farm flock lessens the danger of disease.
- Too mature pullets can be held back by withdrawing all mash and feeding only grains, and this sparingly.
- Arrange the poultry breeding pens. A few more dollars spent for a high-grade rooster will be a good investment.
- Resting and hardening the chicks before they are taken from the incubator makes stronger, sturdier stock.
- Feed a dry mash and green feed so the hens will always have something to peck at without troubling the eggs.
- Please remember the importance of fresh air. Poultry houses that are not ventilated are responsible for many poultry ailments.
- Under good conditions and management it is estimated that at least five to six eggs must be set for every pullet ready for service in the fall.
- A single pair of chicken lice will multiply to 125,000 in eight weeks, under favorable conditions. That's enough to bite up your whole flock.
- Actions often speak louder than examinations. The heavy layer is a busy hen. She rises early and works late.
- Trap nesting the laying hens in your poultry flock will help to eliminate the nonproductive birds, furnish definite knowledge concerning traits and habits of individual birds, help to tame each hen and add mechanical precision to judgment and experience in developing and maintaining the production of the flock.

BYRD'S MOTHER



Perhaps the happiest mother in America recently was Mrs. Richard E. Byrd, Sr., whose son, Lieut. Commander Byrd, made the first successful airplane flight to the North pole.

SMART CHIMPANZEE



Mary, the remarkable chimpanzee owned by the explorer and naturalist, Cherry Kearton, has never been taught anything, but copies everything that she sees her owner do. Here she is at one of his old tricks—cleaning the pipe.