

Keeping Broadcasts In Step on the Waveband Stops All "Squealing"

Clearing the Air of Heterodyne Effects Between Stations Using the Same Wavelength

By John H. Meredith

A PLAN for eliminating, or at least greatly reducing, one of radio's greatest maladies—heterodyning between stations assigned to the same wavelength—has been offered to the Federal Radio Commission by Franklin M. Doolittle, former instructor in radio communication of the electrical engineering department of Yale University.

Mr. Doolittle, who is also the inventor of the "binaural" method of transmitting now used in most broadcast stations, became interested in the problem of eliminating heterodyne interference because his own station, WDRC, at New Haven, Conn., was experiencing a bad howl from WAIU at Columbus, Ohio, 500 miles away. In his own words, this is how he went about the problem:

"Before we adopted the present arrangements, the heterodyning was so bad that it ruined our programs for several nights.

REMOTE

"MONITORING"

"I rented from the telephone company a circuit between my home and the transmitting plant, the two points being about five miles apart. The output of the receiving set is connected to the input of a two-stage amplifier which compensates for the line loss. As the circuit is entirely of cable, the quality is decidedly bass; the line could, of course, be 'equalized' to overcome this

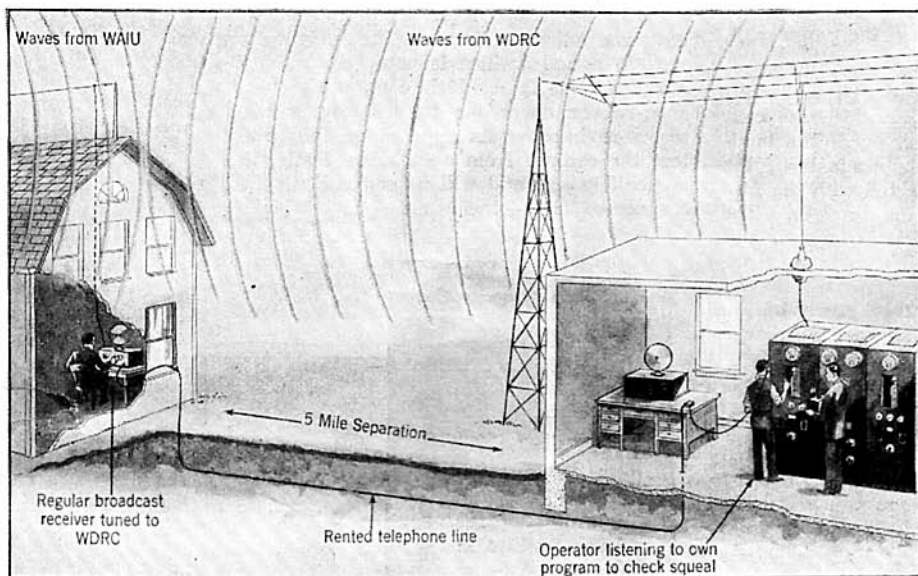
effect, but that is not necessary for the purpose. The set is tuned to WDRC's wave and left there.

"This arrangement allows the operator at the station to hear the program as it is being received, five miles away; and if a beat from Columbus is present, he then adjusts the wavelength of the transmitter until 'zero beat' is obtained. This arrangement does not necessitate passing radio frequencies

ing its frequency; so that it is comparatively easy to make the adjustment with certainty and still not get away from our frequency. In this connection our crystal checks with Columbus within 100 cycles.

"I have particularly wanted to watch the results obtained with the system a number of nights before giving a report as to the results obtained. While the method does not completely eliminate interference, it

greatly reduces this when Columbus is very loud, and for all practical purposes eliminates it when WAIU is coming in with moderate volume. In either case, it eliminates the howl and leaves only an unintelligible hissing sound in the background between breaks and soft passages of our program. This interference sounds like the hissing quality obtained when spark signals are received by the heterodyne method, and is not objectionable.



SIMULTANEOUS PROGRAM POSSIBILITIES

The operator at the broadcast station is thus enabled to determine if there is interference of his station's carrier with that of any other; and correct it accordingly.

over the circuit; but employs only the audio output of the receiver.

"Our transmitter is of the master-oscillator type and we employ a crystal for check-

"We have had such satisfactory results with this method of reducing interference, that I am going to try an automatic control which will start to function as soon as the heterodyne appears. The general plan of the scheme is to control our transmitter with our crystal and to vary the frequency

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Short-Wave Broadcasts from WRNY

SINCE WRNY's short-wave transmitter at Coytesville, N. J., went on the air recently, many listeners have inquired for information concerning the station's operating schedule and its exact transmitting wavelength. For the benefit of these correspondents and other radio fans possessing short-wave receivers, the following information has been prepared by the WRNY operating staff.

The programs of WRNY, originating in studios in Hotel Roosevelt, New York, are broadcast on 30.9 meters (9700 kilocycles), at the same time that they are

radiated on the station's regular broadcast wave, 326 meters (920 kilocycles). The short-wave transmitter has been assigned the call letters 2XAL. The full operating schedule is as follows: (all hours are Eastern Standard Time, five hours earlier than Greenwich Time.)

Tuesday, 7 p.m. until midnight

Wednesday, 7 to 9 p.m.

Friday, 7 to 11 p.m.

Saturday, 7 to 10 p.m.

Sunday, 4 to 6 p.m.

The signals of the WRNY short-wave transmitter have already been reported in

all parts of the United States, many parts of Canada, in practically all the countries of Europe, and in Australia. Listeners hearing the station are requested to send report cards to the WRNY offices in the Hotel Roosevelt, New York City.

An excellent receiver with which to pick up the signals of WRNY and other short-wave stations was described in the October, 1927, number of Radio News. The three-turn coil described in that article should be used. The 30.9-meter signals should come in at about 85 on the tuning-condenser dial, if the parts specified are used.

World's Latest Development!

Television

Build your own Be a pioneer



BE one of the first to own a set; it will enable you to take part in the series of interesting experiments which scientific men are conducting every week.

TELEVISION — The world will soon be using this latest development of the 20th Century as an important means of communication and conveyance of photos of world events to all parts of the globe. Though yet in its infancy, this book, thoroughly explaining TELEVISION, will give you a sound fundamental knowledge of the subject and enable you to build a fine workable set of your own.

Perhaps during your experiments you will discover a startling improvement or a revolutionary method. This will certainly mean unlimited wealth to you!

Before it becomes world-wide, get this book! 116 pages, 9 x 12 inches, fully illustrated.

On All **50c** Newsstands

This coupon will receive our immediate attention

EXPERIMENTER PUB. CO.,
230 Fifth Ave., New York, N. Y.
Gentlemen: I enclose 50c. for one copy of TELEVISION.

NAME.....
ADDRESS.....
CITY.....STATE.....

Wilbert appears in the background. He is one of those "discriminating" males who know whose collars and half-hose (*American, "sox"*) are "just right." A star of the first water! His prominent chin, Siouxian *coiffure*, straight nose and hygienic *ensemble* stamp the picture as the product of the most expensive "Sales and Service" studio in New York.

He answers, manfully, "*It's a Streyberger.*"

By this time I have dreamed a whole romance, *a la* R. W. Chambers, and only when "Streyberger" butts in do I come to earth, yawn and go to bed. Clearly, Streyberger is a boot (*American, "shoe"*) or maybe a Voice Pastille. Anyhow, nothing so common, so prosaic, as a transformer is obtruded into the scene or the print.

I think I may fairly claim that you fellows lifted the idea of this kind of puzzle ad from us; because, long before the U. S. A. brought advertising to the status of an exact science, there was a domestic pot cleaner of saponaceous nature being sold here in huge quantities. It is still to the front, and for some forty years has been advertised by these words: "Monkey brand. Won't wash clothes." There's an idea for you! "Streyberger. Won't skin eels."

A TRIBUTE TO YANKEE INGENUITY

The fundamental difference between British and American amateurs (*American, "set builders"*) is that, whereas the Briton "makes," or if he is pompous, "constructs," his set, the American "builds" his. I observe that in your country the word "build" is applied to the art of assembling anything—except a building. I suppose you "construct" buildings. The idea of "building" a model steam-engine almost as large as a brick strikes us as an example of misapplied terminological grandiloquence, just like these very words—when I really mean to say "swank" (*American, "hot air"*—"*banana oil*").

However, the American lad plays the part well, for in your magazines I often see photographs of him with his jacket off and his shirt sleeves rolled up, a spanner projecting from his hip-pocket and one paw holding down a blueprint large enough for a Board Room carpet. But he is only making a fixed condenser of capacity 0.0001-microfarad!

If I saw a British amateur in a similar predicament I should think he had given up radio and had taken to work, or that his wife had asked him to find out why the electric bell would not ring, which amounts to the same thing.

WHO STARTED THIS THING?

As I read history, there is no getting at the truth. In the days of my first set of (natural) teeth I was led to believe that Faraday practically invented electricity. Reading around, later, I found that Galvani did it, but was sued by Volta for infringement. Still later I discover that, after all, B. Franklin was the culprit. Arrived at man's estate, I judged that they were all mistaken and that Edison beat Tesla by a short head.

One day I was browsing amongst the classics and was pulled up smartly when I read that the stuff had been made by Aristifenit—or some such name—in large quantities, somewhere about 300 B. C. This was a severe blow to me and threw my perspectives out of gear. By this time I had

become so cunning that I promptly made an exhaustive search of the Book of Genesis, hoping to find that Adam was in the game. But I drew a blank. This led me to doubt the existence of electricity.

A couple of hundred volts through the elbow—pure carelessness—revived my belief and I began to favor the theory that electricity had been discovered by Robert E. Lee, during the friction between the North and South. And then, heaven help me! I read that the Chinese knew of electricity 5,000 years ago. I'm done!

Since then I have noticed that the Chinese claim everything. If a man invents a collapsible president or a non-spillable bean, some ass writes to the "Times" newspaper, pointing out that these were known to the Chinks as far back as the Tso-tze-tzu-ling dynasty. As the matter stands at present, I vote for Geo. Washington. No one will assert that he couldn't have dug out the darned stuff if he had thought of it. This solution gives the "old country" a look in, too. (*Looks like more propaganda.*—EDITOR.)

In radio matters I find a similar cloudiness. Marconi plunged in with a complete outfit for radio. Several hundred yards' communication—if the coherer didn't blow up. Then Popoff was said to have been the "father of the coherer." Well—he's welcome! Next, Dunwoody, U. S. A. Army, clambers in with the carborundum crystal, which was for some years the hall-mark of a gentlemanly receiver, and gave me many a hectic hour in the days before the valve (or tube). Dr. Fleming then put two electrodes into an electric-lamp bulb and called the result a "valve." Not to be outdone by an effete Britisher, Dr. Lee de Forest promptly clapped in a third electrode and called the result a "tube."

HOW THAT TUBE'S GROWN!

Since then, other cheap imitators have shoved more and more electrodes into the tube, and now you can get a tube which contains the set, instead of *vice versa*. In a few years' time it will be necessary for the radio man, his wife and his family, to get inside the tube. Then I shall invent a tube to contain also—the dog and a cocktail outfit, with a spare room for the lodger, complete with loud speaker, toothpick stand and footwarmer, unbreakable windscreen, electron-sifter and cigar lighter; valet service optional. No gratuities (*American, "tips."*)

But I expect some Yank will be ahead of me, with an annex, folding, for squash rackets, fireworks displays; plunge bath and cinema screen.

Sometimes I wish I were back in my 1,000-year-old village in Kent, England.

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of the crystal by variations of its temperature, which is controlled from the receiving set at home.

"It would seem to me, that if such a system is practical, it might add to the practicability of chain broadcasting on the same frequency."

This same system has been used with success by a number of other Eastern broadcast stations, notably WODA, in Paterson, N. J. The general arrangement is illustrated herewith.