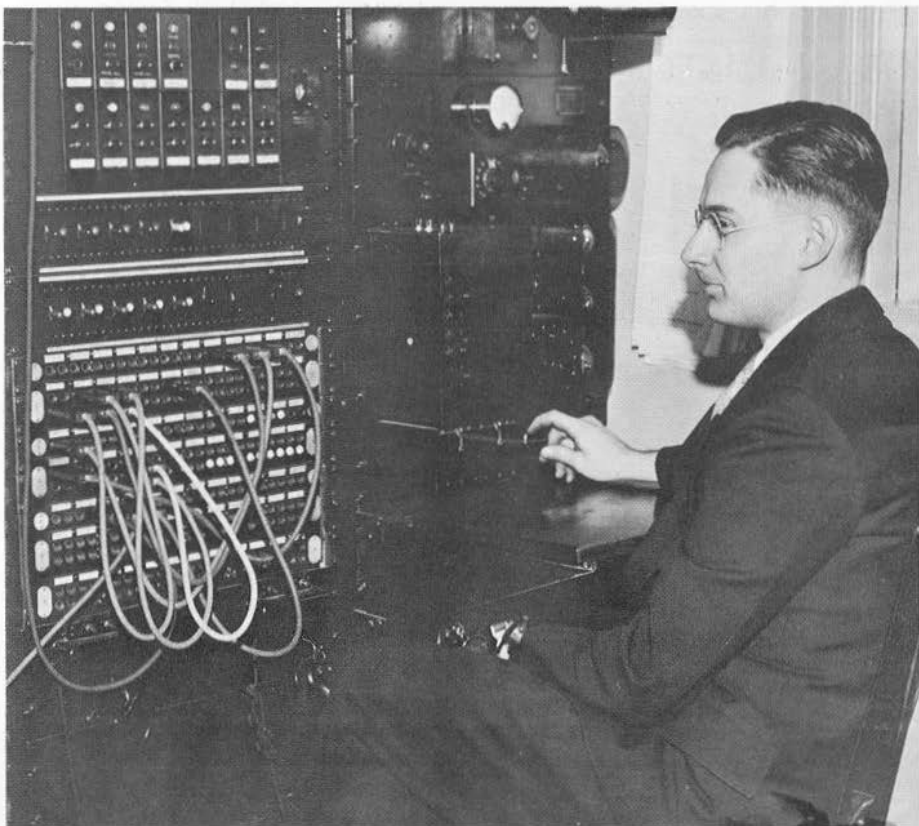




Ken Gardner, W2EGN (ex-8BGN) at WHAM Studio Control position about 1926

Rtty

TELETYPE PIONEERING ON OLD WNL, 60 KC. Rochester, N.Y. played an important part in early development of RTTY. This took form in test transmissions from WNL, the A.T. & T. transmitter at Rocky Point, N.Y. in the 58.5 to 61.53 kilocycles, to the A.T. & T. test room on Rochester's North Fitzhugh Street in 1930.

You will recall that about 1922, they had inaugurated the first commercial trans-atlantic radio telephone service over WNL after the work of Arnold and Espenschied. SSB with suppressed carrier proved itself out during tests of this equipment and in addition the system was "crynconoped" or "speech inverted" for secrecy. Traffic was at such a high density that there was a long waiting list to Europe. American and British operators were stumped frequently with pronunciations and spelling of names, etc. of foreign callers -- so to solve

this problem a teletype printer system was set up as an overseas order wire.

Radio teletype was discussed with R.A. Heising and others in 1922 when it was successfully established on various circuits over land and sea and the Navy even operated a leg to planes in flight. These transmissions were either concerned with public and official demonstrations or commercial operation to fill a crying need and no time was taken out to obtain qualitative or quantitative data on large scale. This brings us to the Rochester part of the story.

Obviously the percentage of errors on a RTTY circuit is a function of the signal-to-noise ratio. Rochester offered a point where these could be measured and where there were existing wire-line teletype facilities which could be used as a simultaneous and continuous standard of comparison. It was at such a distance from Rocky Point that signals could be adjusted conveniently for comparison with Houlton, Maine (the trans-atlantic

receiving station) where long haul signals and noise levels had been under study for some time for their diurnal and seasonal variations. Correlation could thus be set up for predicting any commercial circuit errors vs. noise.

The mighty 50 KW single sidebander at Rocky Point was re-adjusted to 700 watts to simulate long haul conditions at Rochester and tests were underway using two tone mark and space system then in use for commercial land wire. Bell Labs supplied receivers, measuring equipment and a beautiful loop antenna for reception in the attic at Fitzhugh Street where your author was privileged to peek. It was fascinating to go downstairs and watch two machines thumping out identical copy, knowing that one was via radio.

After signal-to-noise measurements were made and copy errors checked, analysis showed .1% error at approximately 27 DB signal-to-noise ratio and 1% error at about 22 DB sig to noise ratio. This curve, correlated with Houlton, lead to some interesting results as reported by Bailey and McCann in December, 1931 IRE Proceedings.

For instance, on 60 KC. SSB with 1 KW., transmission could be accomplished thru out the year with no errors except during May thru September when they rose to .15% at a distance of 100 miles. Like transmission could be accomplished at a distance of 400 miles with a power of 316 KW. (Ever listen to summer static on the "long waves"? Old timers will remember the "crashers and grinders" that lifted them out of their chairs and after a long watch caused them to hurl the "cans" at the bulkhead.)

Many of us spent hours scanning 600 to 30,000 meters on our honeycomb coil regenerative sets and often with the aid of an auxiliary oscillator listened to the transatlantic traffic on WNL. It was some time before we tumbled to the meaning of that mysterious warble we heard at times between conversations.

Such were the growing pains of RTTY without benefit of shortwaves, FM carrier shift keying, pulse re-shaping and other modern benefits which make present day copy almost anywhere practically perfect. The longwaves still have many TWX circuits thumping out copy by the hour over NAA, NIK, NPG, NSS, NPM and a host of other VLF stations that can't be identified because they never transmit straight English. There is even one operating at times around 425 KC. Anybody know who it is? Maybe ship to shore ?? Could be WCC on 436 or WSL on 418 KC. - Ken Gardner, W2BGN, x-8BGN
Former Chief Engineer WHAM

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