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Mr. Grote Reber,  
National Radio Astronomy Observatory,  
Green Bank, West Virginia,

Dear Mr. Reber:

Your communication in the July IRE indicates that you are interested in hearing of early uses of inverse or degenerative feed-back. I suppose every engineer can find in his old note books what he feels is an anticipation of almost any invention you may care to name. I know I can. For instance I find that in Feb. 1924 while an instructor in physics and electrical engineering at the Palmer Physical Laboratory in Princeton, I described an oscillator with a forward feedback path to make it oscillate, and also a reverse feedback path designed to increase in its effectiveness more rapidly than the forward feed as amplitude increased. The idea was to stabilize the amplitude at a low level.

In 1923 I used reverse feed back to quench oscillations in a superregenerative receiver. In this case the reverse feed back was turned on and off by the quench frequency voltage, the normal feedback being fixed.

About this time I also worked out circuits for producing by feed back, positive or negative resistance or reactance in any desired proportions. Some uses of these feed backs are to be found in some of my old patents. The general idea is described in a book I wrote called "How Radio Receivers Work" published by Doubleday Page and Co., copyright 1925. This book was actually the publisher's compilation of articles I wrote for Radio Broadcast Magazine in about 1923 or 1924. The adjustable phase feedback is described in article 74 of the book.

I think that many engineers must have appreciated the possibilities of various kinds of feed back, such as for ~~stage~~ voltage controlled reactance and resistance, but the thing that Black contributed was to my mind the idea of using (not originating) inverse feed back for stabilizing something. For example, making the gain of a stage or more fairly independent of the tube performance, and helping out the linearity.

Incidentally I believe you not long ago asked for ancient radio equipment. I have quite a lot of parts, perhaps some old iron core rf transformers, dating back to around 1921 or so, and if you are ever in Princeton I would be glad to have you look over the stock. But not between Nov 1 and May 1 when we rent our house here and live in Florida.

Sincerely yours,

Walter Roberts

(over)

P.S. My brother, R.B.Roberts, of the Dept. of Terrestrial Magnetism, Carnegie Inst of Washington, recently bought himself a few hundred acres of uninhabited mountainside for a summer camp and has just built a camp house on it. I think it was near Green Bank. If so, I hope you can run into him sometime. He was much interested in Howard Tatel's radio astronomy work.