

## CONTROLLING FACTOR IN RADIO RECEPTION FOUND

### TWO-YEAR STUDY SHOWS BAROMETRIC PRESSURE MOST IMPORTANT INFLUENCE

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Providence Man Upsets Theory of Radio Engineers That Temperature and Magnetic Blankets Govern Clarity – Providence Journal Presents Discoveries

Barometric pressure, not temperature of magnetic blankets, is the controlling factor in clarity of radio reception, according to Alonzo R Williams of 102 Meeting Street Providence, who has made available to the Providence Journal the results of a painstaking analysis of conditions affecting radio reception during the past two years.

Mr. Williams has carefully charted the results of his investigations. The Journal presents herewith a chart covering two months of the two-year period over which Mr. Williams carried on his investigation.

They are typical months, showing good reception in September, 1927 and exceedingly poor reception in February of this year. The poor reception during the cold weather of this winter was the circumstance that upset the calculations of radio engineers all over the country, the supposition having heretofore been held that cold weather was favorable to radio transmission and hot weather unfavorable. Mr. Williams presents an entirely new theory to the radio world in his contention that barometric pressure and not temperature is the controlling factor. Mr. Williams article in full follows.

BY ALANZO R. WILLIAMS

The question has been on the lips of every radio fan. "What was the matter? Why was radio reception so poor this last winter?" Heated discussions over the lunch table have developed as many theories as there were participants. Radio journals, magazines and radio engineers have advanced one reason or another. Among the various and varied explanations have been sun spots, aurora borealis, high temperature, "magnetic blankets" and static electricity. Being a radio fan myself I saw no reason why I should not develop some theory of my own, convincing to myself, at least, and at the same time check up on some of the theories of others, especially as ". . . many electrical engineers are pondering on the whys and wherefores of magnetic blankets in general and in particular the one that rendered the early 1926 reception the worst experienced in winter for at least five years." (Robert Mack in Providence Journal, dates Washington, Feb, 16, 1926)

As a result of careful records and painstakingly analysis I have evolved what to me seems to be the real solution and gladly "let the rest of the world in on the secret" through the columns of the Providence, Journal.

The set which I use is a one-tube reflex with crystal detector with which 133 DX stations have been logged.

The reception referred to in this article is of DX only and does not include local stations and, for the most part, limited to hours when local stations are off the air. With one station only on the air a wave trap was used.

Reception, static and fading referred to herein are divided into three stages to wit: RECEPTION (1) Perfect, (2) Fair, (3) Poor. STATIC (1) Slight, (2) Disturbing, (3) Crashing. FADING (1) Slight, (2) Disturbing, (3) Complete.

RECEPTION is perfect where stations are heard clearly, with good volume and no disturbing influences at work. The set in fact seems alive with varied programmes. It is FAIR when a fairly good number of stations can be heard, interfered with somewhat by static and fading when the signal strength is not what it should be. It is POOR when few if any stations can be located, only the whistle detector of when the reception is so distorted that one must switch off the current to reserve peace of mind and quiet at home.

STATIC is slight, when a faint disturbance is noted which in no way interferes with clarity or volume. It is DISTURBING when its volume is such that it disrupts programmes at times. It is CRASHING when it blots out reception by thunderous rags and continuous crackling and sputtering's.

FADING is slight when a slight variation in volume is noted, disturbing then the volume surges back again or remains weak for a while and then returns to strength; it is complete when the station disappears entirely for long periods and does not return to strength sufficiently long to make listening worthwhile.

The records which I faithfully keep are: Temperature readings, 7 a.m. and 10 p.m.; barometer readings, 7 a.m. and 10 p.m.; character of reception, time station is heard and its dial readings, and degree of static and fading.

All these have been charted from September, 1925 to May, 1926 and from this chart the following is perfectly apparent that BAROMETRIC PRESSURE CONTROL CLARITY OF RADIO RECEPTION.

Accompanying this article are the records of two separate months, September, 1925, and February, 1926. September, 1925, is typical of fair to perfect "reception" conditions and February, 1926, typical of fair to poor. Lack of space prohibits the printing of the complete charts for the eight months. On this chart the dots connected by lines show the readings taken at 10 p.m. Dots not connected by lines show readings taken at 7 a.m. The lines, therefore, show the rise and fall of the barometer or temperature from 10 p.m. on the preceding evening. In the barometer section of the charting normal average for this locality is shown at 30.05. In the temperature section the normal average for each month is shown by a straight line across the chart. In the sections having to do with reception, static and fading the order of reading is with "Perfect" or "Slight" at the top and the downward with "Fairly", "Poor" or "Disturbing" "Crashing" or "Disturbing" "Complete"

During the eight months in question the following facts have been noted:

The barometer has been below 30.05 for the greater part of the time, that is to say, below normal.

The rise and fall of the barometer had been extreme, rapid and almost constant. It has seldom remained steady at any point.

With a rise in the barometer to 29.9 or below, there comes fair to poor reception with static and fading.

With a rise in the barometer to 30.1 and above, there comes perfect reception with a disappearance of static and fading.

With the barometer above 30.1 there will be perfect reception, but if there is a sudden drop in progress at the time or a very sudden rise, there will be more or less static noted. If reception is poor with a "high" it is absolutely certain that a fall well below normal is in immediate progress.

With the barometer below 29.9 or even below 30.05 there will be static and fading more or less. The lower the barometer is below 30.05 the poorer is the reception and the greater is the static and fading and this applies to any degree rapidity of fall or rise. If below 30.05 providing the rise does not go higher than 30.05. If fair reception is noted with a "low" barometer it is certain that a rise to above 30.05 is in immediate progress.

The above holds true irrespective of temperature for I have noted wonderful reception with the temperature extremely high for the period of the year but the barometer reading was also high and the rise in temperature was rapid.

Temperature changes do not affect reception. The "clear and cold" theory for good reception does not hold true if the barometer is below 30.05.

Electricity discharged in the air such as thunder storms and the like will cause static of marked degree but if the barometer is carefully noted it will be found to be rapidly falling.

Every fan will admit that during the winter 1924-1935 the reception exceptionally good. To further test this theory I examined my records for that period carefully and found that during most of the winter the barometer was well above 30.05 and as high as 30.8 with a few rapid changes but when there were rapid falls below 29.9 the reception became poor and static and fading increased.

I reason out this theory thusly.

HIGH PRESSURE means that the direction of our upper atmosphere is downward the earth to take the place of the warm lower strata which is moving upward. In other words the atmospheric pressure is down into the open end of a barometer tube forcing the fluid there in upward in the other tube and registering "high" in the tube. I am no scientist so the following may seem absurd to a second Steinmetz but whatever such a one may say it does seem to me that whatever tends to keep the electromagnetic waves of transmission near mother earth the ore of them will be received on mother earth. No matter what the scientific reason may be it just happens, that's all. Of course if that high pressure downward is very rapid movement, I opine, must of necessity distort signals passing through the disturbed area. That happens, too, whatever the reason. Throw a stone into a quiet mill pond and see the wavelets go out in all directions. In radio the spark is the stone, the wavelets are the same. Throw a stone into a mill pond disturbed by a high wind. Your little wavelets will still go out in all directions but oh how they do bob up and down and as far as you can determine do not get very far. As you can determine do not get very far. As for static it is grounded out unless the change is rapid. I may be wrong in my so called scientific reasoning but what of it if it works?

LOW PRESSURE means that the low lying warm strata is in upward movement away from the earth. The pressure is released from the barometer tube which allows the fluid in the other tube to fall and register "low". The atmospheric trend here is up and away from the earth and so, I opine, that the more that goes away from us the less we have. In this "upward and away" trend it seems to me that a part at least of the electro-magnetic waves go in the same direction or are influenced in that direction. The fading is due to undulating waves upward and the static is not grounded out.

A glance at the September chart will reveal the fact that there were no sudden barometric changes during that month and that the needle pointed to a reading steadily around normal and above and consequently the most perfect reception of the whole 8 months and with less static and fading than in any other month.

A glance at the February chart will show barometer reading below normal practically the whole month with rapid "rises" and "falls" mostly will still be below normal and, consequently, poor reception with static and fading.

In neither month do temperature changes affect the result in spite of the old theory that "clear cold nights" are the best.

Another peculiarity worth mentioning here is that when the pressure is "low" and below normal it is impossible to "cut out" a local station with a trap whereas when the pressure is "high" the trap "chops out" the local station completely and DX comes through beautifully. This phenomenon I cannot explain. I can almost predict a change by the action of the trap.

Of course the static referred to hereon is not so great as that experienced with a tube detector almost by which it is amplified so this must be borne in mind in testing out of theory.

According to Robert Mack in the Providence Journal writing from Washington under date of February 16, radio engineers believed as "magnetic blanket" existed which had been lifted. As a matter of fact the poor reception still continued. He writes further "Magnetic blanket", it is said, may not be the work for it, but in the absence of any definite knowledge of the phenomena that had troubled radio listeners for six weeks it will serve as well as any other phase.

Not having heard or read of the possibility of barometric pressure having an effect on radio reception, I offer this theory to those who are interested, including the above referred engineers for their consideration and check, hoping that it may in some way explain the conditions experienced this whole winter long and even now, and as an aide to prophecies in the future.