

ATMOSPHERIC EFFECTS ON MEDIUM WAVE RADIO RECEPTION

By Leonard Hyde

The popular view is that low level atmospheric phenomena, such as fronts, high and low pressure systems, et al, have very little effect on reception of medium wave signals. My observations over the past two years or so indicates that this is not true.

At this time, I feel I can safely present these theories. Proof is still far away, as is sufficient data to support forecasting of any kind. Perhaps this will stir others to make investigation into this field.

1. Wet ground and snow cover will reduce attenuation of ground wave signals, with a noted increase in signal strength. This is no doubt due to better soil conductivity. If the entire path between transmitter and receiver is involved, the effect can be dramatic. Where frozen ground is concerned, the small amount of data I have suggests that there is little, or no effect. Frozen ground is most likely similar to hard, dry ground where ground conductivity is concerned.

2. Weather related anomalies are far more likely to occur when a low pressure system is involved. In most DXers minds, high pressure tends to be associated with the settling down of the band, and "normal" receiving conditions. My observations indicate that this is true.

3. Weather fronts, especially cold ones, can cause unpredictable, yet dramatic effects on receiving conditions. This effect can be of short duration, and highly frequency selective. The cause of these effects is not known. Conventional wisdom dictates that a weather event in the lower layers of the atmosphere could have little effect on propagation of radio waves, which relies on the ionosphere, high above any such phenomena. My findings indicate otherwise.

On numerous occasions here, unexpected effects have been noted with a cold front nearby. As mentioned before, the effects can be highly unpredictable, of short duration, and frequency selective. Sometimes no effects can be observed at all.

The most dramatic case I have of this phenomena happened on 12/21/92. At 4:35 PM, with the squall line from an approaching cold front visible in the west, unexplained reception of stations from the Deep South was noted. This was before sunset, at least an hour to an hour and a half before such stations would normally be heard. Two different stations were heard on 1140, a frequency usually dominated here at that time by 50,000 watt WRVA, about 150 air miles away.

At 4:35, WBXR, Hazel Green AL was heard, dominating the channel. Five minutes later, WBXR had given way to WQBA, Miami FL. Neither of these stations were ever heard here before, and have not been heard since. Half an hour later, after passage of the squall line, conditions were back to normal, with WRVA firmly in place. Other frequencies showed no such effects.

It would be easy to pass this off as a fluke, but I have noted it many times. It is impossible to predict. Usually, only one frequency, or at most, a narrow band, is affected. I have dubbed the effect "cold front ducting," though it is not known if actual ducting occurs. Ducting would only affect the ground wave component. I am not sure that the ground wave could result in reception at the levels noted at such distances. Such effects are well known on VHF and UHF frequencies, of course.

Last winter, a well documented case occurred on the West Coast, which was widely noted and reported in this bulletin. With a vigorous weather front poised over the California coast, western DXers noted daytime reception of stations many hundreds of miles away.

4. Effects on ground wave reception by fronts and changes in the barometer have also been noted. With my daytime noise level here, I have seldom been able to take meaningful readings. However, others, most notably Guy Kudlemeyer, have discussed this phenomenon in these very pages. I did note the effect more than once in West Virginia, always with low pressure in place, and high pressure in the offing. This is before the passage of a front, with low pressure, and generally with cold, rainy weather in place. Clearing would come that night, or the next day.

There is still insufficient data to certify these ideas as facts. Certainly, much more research is needed, preferably by many different observers in different locations. Also, at this point, no attempt has been made to coordinate these observations with other phenomena that affect propagation, such as geo-magnetic and solar occurrences. Still, it seems safe to say this: any time a cold front is in the area, turn your radio on. You are likely to hear something unusual.