



MEASURES OVERCAST

Scientists Harry Diamond, Wilbur S. Hinman, Jr., and Francis W. Dunmore (left to right) of the National Bureau of Standards hold the radio meteorograph ready for launching. The device not only tells upper air temperatures and barometric pressures for altitudes up to nearly 12 miles but also measures the thickness of clouds; knowledge of great aeronautical value. Even though unseen above clouds a directional antenna can spot the position of radio signals from this instrument and by calculation the wind velocities overhead can be obtained.

RADIO

Find Why Many Stations Are Received on One Dial Setting

Mystery of a Year's Standing Now Cleared Up When Poor Contacts in House Lighting Were Found at Fault

THE year-old mystery of multiple station reception on a single dial setting of a radio receiver has at last been solved. It all started when a radio service man was called to a home in a certain part of New York where the complaint was, "When I tune in WEAF I also hear WOR and WJZ."

Spinning the dial to 660 kilocycles for WEAF, the service man found that the complaint was no myth. Truly he was puzzled, for the three New York stations are widely separated, with WOR at 710 kilocycles and WJZ at 760. Careful examination revealed no internal trouble in the receiver. Seemingly no explanation was logical. Yet other complaints in the same neighborhood soon lent additional mystery to the happening.

News of this peculiar phenomenon reached the ears of the R.C.A. License Engineers. Moreover, they had heard similar reports from other cities, especially Cincinnati, where the engineers of the Crosley Radio Corporation had already started an investigation. Scouts were sent out by both of these groups to obtain all pertinent information about the affected neighborhoods. When they compared notes, the plot thickened. It was apparent that all of the affected vicinities were in areas where there were at least two strong station signals. Yet, only certain houses were troubled. Finally, one night, they struck the clew that put them on the right track.

At one home, it was found that this trouble did not occur when the lights were off. It was thus immediately evi-

dent that the house wiring must account for the trouble. Examination of the wiring revealed a faulty contact. When this was repaired, there was no more interference.

Further investigation revealed that faulty grounds or contacts on the power lines often caused the trouble, while in other instances, poor contacts within the house wiring, or even the plumbing, were at fault. In every case, however, there was a poor contact between two conductors, which acted as a rectifier.

Reported to Commission

On the basis of this, the engineers were able to frame a simple explanation, which the Crosley Corporation presented in report form before a recent meeting of the Federal Communications Commission. It was brought out that the conductor making a rectifying contact becomes a small transmitter, sending out spurious frequencies, which bear a definite relationship to the frequencies of the signals it picks up.

For instance, if the frequency of one station absorbed is designated as a , and that of another, b , the transmitting element sends out the frequencies $a+b$, $a-b$, $2a$, $2b$, $2a+b$, $2a-b$, $2b+a$, $2b-a$, $3a$, and $3b$. Some of these are not heard, because they are outside of the broadcast band. Others occur in positions between stations, where they cause no interference. Occasionally, however, one of these spurious frequencies, coincides with that of a local station, making trouble. This is exactly what happened when listeners complained of hearing WOR and WJZ on the WEAF frequency. For, if WJZ, with a frequency of 760 kilocycles, is designated as a , and WOR, with a frequency of 710 is designated as b , then $2b-a$ is equal to 660, which is exactly the frequency of WEAF.

Preventives

In order to prevent this happening radio engineers suggest improved grounding of power lines and house wiring; installation of radio frequency chokes and bypasses, to prevent the power lines from picking up the radio-frequency signals; and, in some cases, a relocation of the receiver antennas in order to diminish pick-up from the power lines.

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Fossil plants have been called "thermometers of the past," because they show what ancient temperature conditions must have been to enable them to grow.