Trouble Shoot Your Antenna from Indoors

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Would you like to shoot trouble on your TV or short-wave antenna without going outdoors? It can be done, without the need for any complex instruments. The cost? Just a few cents. Here's how it's done. Assuming your antenna feeds into a transmission line of the 300-ohm type—this applies to most installations—the trouble shooting setup becomes simplicity itself: two carbon resistors, plus an ordinary ohmmeter (**Fig. 1**).

Two composition resistors, of values approximating 100K ohms each, are connected in series. This combination is then connected to the "top" end of the twin lead, where it joins to the antenna proper. Now...the twin lead is disconnected from the equipment which it feeds, such as TV receiver or short-wave apparatus. The normal reading for a "folded-dipole" type antenna installation will be in the order of a few ohms, possibly as high as 5 or 10 ohms at most. Should a break occur in the antenna or "flat-top" portion, the ohmmeter will read in the neighborhood of 200,000 ohms. On the other hand, if the meter readings should be extremely high, it is safe to assume that the twin lead coming down from the antenna has a break in it somewhere. Through this simple process of elimination, the experimenter quickly pinpoints the area of trouble. This reduces the total time needed for diagnosis and repair. It will also eliminate, or reduce, the need to climb over hazardous rooftops, thus cutting down on a few bruises, or possibly broken bones.

This scheme, using resistors, is not confined to antennas of the folded-dipole type. Many short-wave and TV antennas have a single conductor for the flat-top, such as a copper wire or an aluminum rod or tube. Breakage in the antenna proper is thus easily spotted. But twin-lead breakage, concealed inside a plastic overlay, cannot be detected without a minute and close-up inspection. Rather than needlessly risk a broken arm or leg, why not put two ten cent resistors to work? (**Fig. 2**).

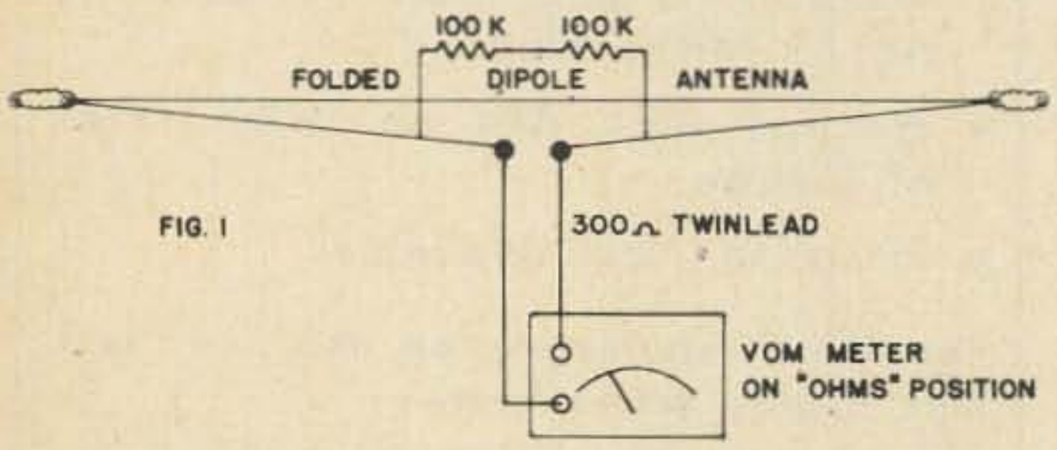

FIG. 1

#1 Possibility: Ohmmeter reads "low ohms," 5-10 ohms maximum. System OK.
#2 Possibility: Ohmmeter reads 200K ohms, folded dipole section of system disconnected from feedline; or, folded dipole "open."
#3 Possibility: Ohmmeter reads much higher than 200K ohms, the feedline has an "open circuit" before it joins the antenna section.

In the case of "intermittents," one of the hardest of all radio troubles to spot, sometimes the fault may be determined by placing the ohmmeter terminals across the lower end of the down-lead, while at the same time keeping a sharp eye on the ohmmeter and simultaneously shaking the twin lead. The few check-points in this elementary "system" are not a 100% cure-all, but each only takes a few minutes' time; and in the majority of cases, diagnosis can be completed while the experimenter stands on "terra firma." Half watt resistors will suffice for all receiving set-ups, and 1 watt resistors will work out fine for all low-power amateur applications, both receiving and transmitting. Two watt resistors should be used for high-powered "ham" applications. In any case, very little power loss takes place through the resistors, since their total of 200,000 ohms is approximately 3,000 times the nominal impedance of a resonant dipole, or 70 ohms. The reason for using two resistors in series is mechanical, rather than electrical. Located as they are shown in the diagram, there is no physical strain on the resistors, and no chance for them to "open up." To avoid any chance of trouble, clean all connections thoroughly, and then solder them.

In addition to connecting the resistors to the antenna, trouble can be avoided by using twin-lead that is made with copperweld steel. The cost is no more, and it is far stronger than ordinary twin-lead, which is made with copper. Several manufacturers produce this "long life" variety of twin-lead. Belden offers these under several designations, such as type 8285 Permohm, type 8275 Celluline, and type 8230 Weldohm. Of these three, the last mentioned is least expensive. Amphenol makes

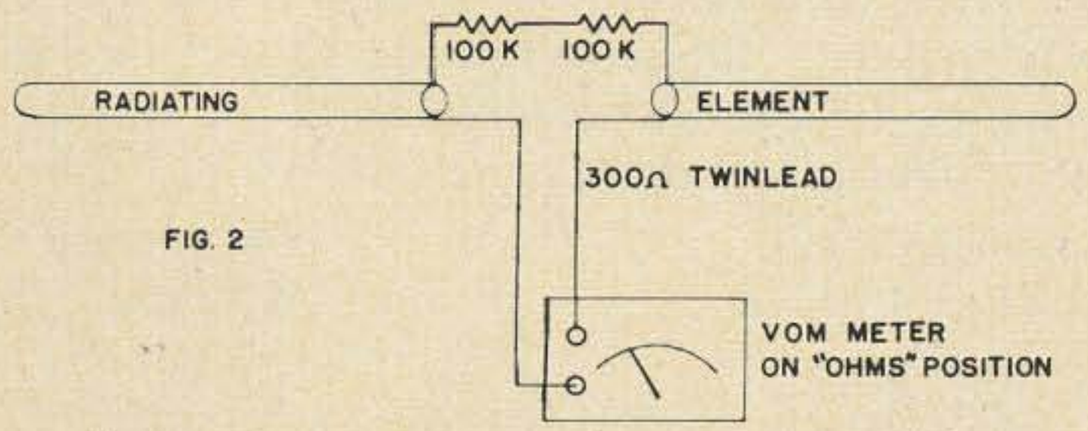

FIG. 2

#1 Possibility: Ohmmeter reads approximately 200K ohms. System is OK.
#2 Possibility: Ohmmeter reads very high, in megohms. Twin lead is "open."

a similar flat line, "Steelcore," number 214-559. A somewhat more expensive line by Amphenol is their number 214-022, which has two number 16 conductors and is suitable for transmitting amateurs. Other makers offer copperweld twin-lead under such names as "lifeline." If doubt should exist as to the wire's having a steel center or core, a small magnet will give an indication of the wire's being copperweld. If you have been having trouble with ordinary twin-lead breaking frequently, why not give one of these copperweld lines a trial? You will be impressed by their relatively greater durability. Through the utilization of long-life twin-lead, plus the resistor scheme, it should not be necessary to make that dangerous trip to the roof so often.

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