ing, but unreliable, distances. Distances of 400 feet have given errors of up to 10,000 feet. These errors are attributed to "magnetic flux" that resides around high-voltage power lines. An error this large is very obvious but other, smaller errors, may not be. Radar and microwave installations can also affect the accuracy of an EDM. Interaction with this type of high-powered transmitter is rare and is usually limited to areas around airports and microwave sites.

The bottom line is: be aware of atmospheric conditions. local power and transmission influences, and pick occupation and foresight points that give the best, clear line of sight between the EDM and the retro prism.

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As always, I welcome your comments, agreements, and disagreements. Send any correspondence to THE TECHNICAL SIDE, 1562 Linda Way, Sparks, NV 99431 or fax it to 702-359-6693.

Upcoming ISTO Events

September 22

* **7th Annual General Meeting**, *Midland*
* **Hands on Equipment Demonstrations with**
  Gemini Positioning
  Pentax
  Norman Wade
  Sokkia

September 23

* **GPS for Technicians**, *Midland*
  presented by: James Ferguson, OLS

Details on these workshops and others will be in the 1995 Membership Services Kit.

The Technical Side
PPM Correction Variables

By Doug Crook

Calculating and applying the proper atmospheric correction (PPM) to an EDM distance measurement is **extremely** important. The density of the atmosphere varies with changes in atmospheric pressure and temperature. The speed of the EDM light beam used to measure a distance varies with atmospheric density. Take as great a care as practicable when you obtain the atmospheric pressure and temperature. Accuracy of the PPM correction is directly affected by the validity of these two values.

The most accurate atmospheric pressure is obtained by using an altimeter/barometer. The average atmospheric pressure at sea level is approximately 29.92 inches of mercury. As elevation increases, the pressure decreases. The decrease is about one inch of mercury per thousand-foot increase in elevation. At an elevation of 5,000 feet, the actual (uncorrected) atmospheric pressure will be about 24.92 inches of mercury, for example: (29.92) - (5 x 1) = 24.92.

The most accurate temperature can be obtained using a thermometer. The temperature must be taken in the shade in still air to give the most accurate reading.

The temperature and atmospheric pressure are used in combination to give a correction factor stated in parts per million. The correction is applied to the slope distance. Virtually all modern EDM units have a way of entering the PPM correction, either as a PPM value or the raw temperature and pressure.

The error caused by an inaccurate PPM value can be a result of inaccuracies in any one or any combination of temperature, atmospheric pressure, or PPM value.

Some values:

1 Part Per Million = .001 feet per 1,000 feet
10 PPM = 0.01 ft per 1000 feet
2 degrees Fahrenheit = 1 PPM
0.1 inch of mercury = 1 PPM

The best way to test the effect of the PPM correction is to obtain a 1,000 feet distance using 0 (zero) PPM and then shoot the same distance using 100 PPM. You should see a difference in the distance of about 0.1 foot.

Try it, you'll be convinced!

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We invite you, the reader, to bring us specific questions and topics to be discussed in this column. Written questions can be mailed to: THE TECHNICAL SIDE, 1562 Linda Way, Sparks, NV 89431 or faxed to (702) 359-6693.