density or what pilots call high-density altitude. The less dense the air, whether the result of high altitude or hot temperature, the greater the error between CAS and TAS.

A calculation must be performed that takes temperature and pressure into consideration to convert CAS (or EAS if applicable) to TAS. Some pilots buy true airspeed indicators, which do the conversion automatically; others buy a less expensive basic airspeed indicator with a rotating dial around the outside, as shown in Figure 2-2. The dial, when manually set to the correct pressure altitude and outside air temperature, gives the pilot the TAS conversion. If you do not have an airspeed indicator that shows TAS, it is possible to calculate a reasonable estimate by adding 2 percent of the indicated airspeed for every 1000 feet of altitude. For instance, if your indicated airspeed at 5000 feet is 100 knots, your TAS would be approximately 110 knots. When you take TAS and correct it for the ambient wind, the result is your ground speed.

Sensitive Altimeter

To the untrained individual, the altimeter can be a very misleading instrument. The altimeter measures the weight of the air above the aircraft rather than the distance between the airplane and the ground. While that may appear illogical, consider what would happen if the altimeter actually measured the distance between the airplane and the ground. Imagine trying to fly at a constant altitude; the indicator needle would bounce up and down every time it passed over a hill, rock, or building. Instead, we fly at a constant pressure

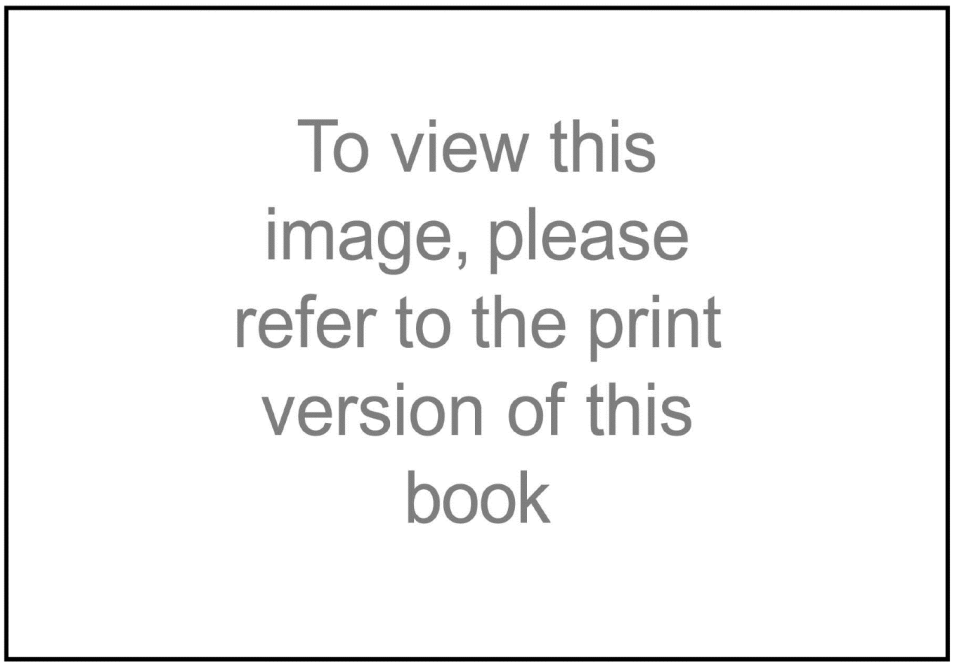

Fig. 2-2. *Airspeed indicator with true airspeed dial.* (Photo by author, courtesy of Frasca Air Services)