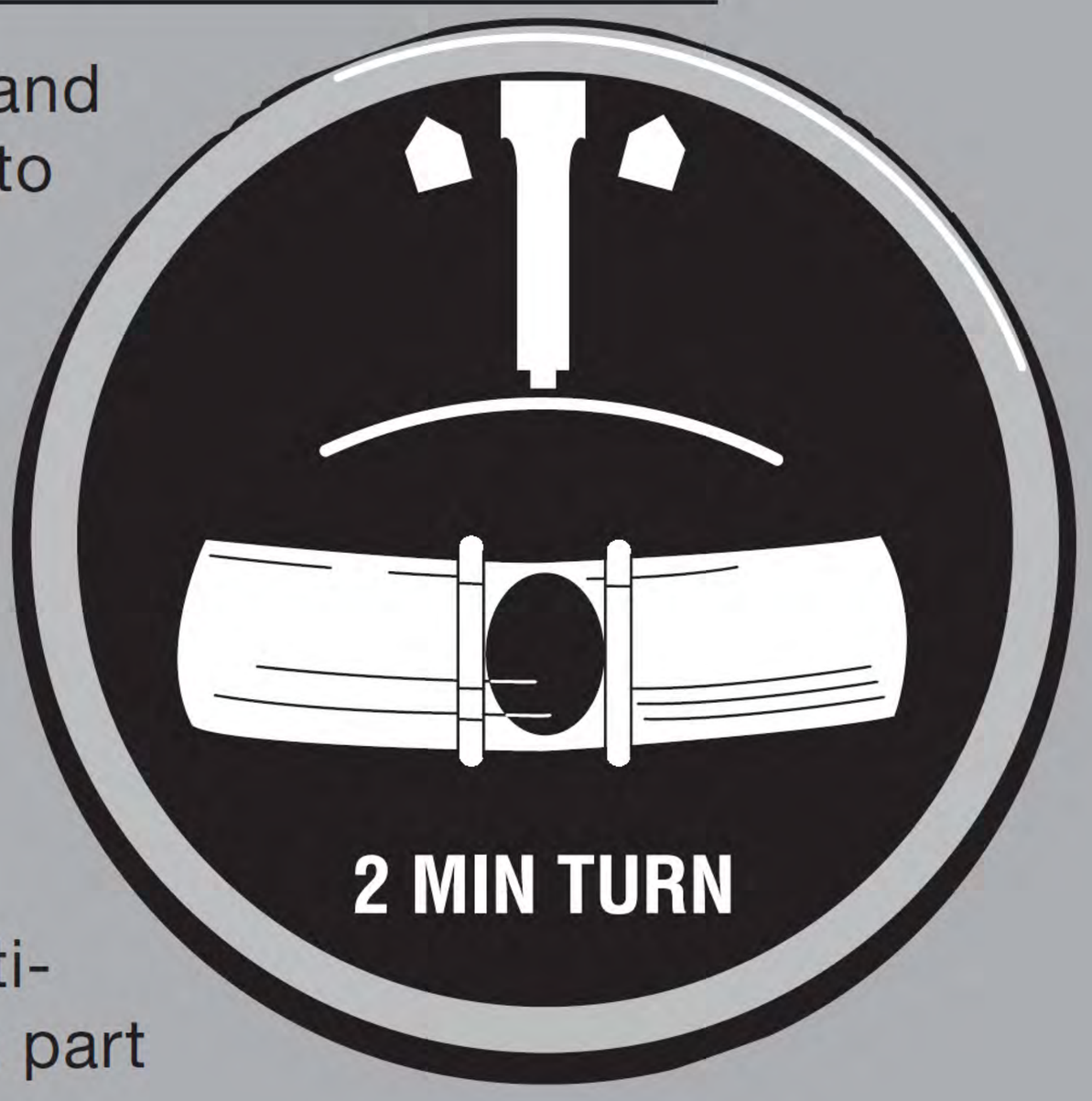
Doing It Old School



If I owned a glass-cockpit airplane and decided to add but one instrument to the panel, it would be an old-fashioned turn-and-bank needle with a slip/skid indicator. The slip/skid is to help maintain coordinated flight (and zero-sideslip, in a twin-engine airplane on one engine); the turn needle is to help avoid and recover from unusual attitudes.

Yes, by regulation, glass-cockpit airplanes need to have a backup attitude indicator (AI), and for the most part an AI is better than a turn-and-bank. But most glass-panel AIs do not provide slip/skid information (that's provided by a small line-and-triangle on the PFD). And unlike turn-and-bank indicators, attitude indicators can tumble and become unusable if you get the airplane into an unusual attitude.

The earliest instrument pilots flew primarily by "needle, ball and airspeed"—maintaining heading and coordination with the turn-and-bank, slip/skid combination and pitch attitude with the airspeed indicator.

Top, a conventional turn-and-bank indicator. Bottom, the Bell X-1B's instrument panel is depicted, clearly showing the turn-and-bank instrument at left-center, with an artificial horizon next to it.

Look at the panel of a World War II-era airplane, for instance, and you'll usually see the turn-and-bank nearly directly in front of the pilot, and an artificial horizon, if installed, somewhere off to the side. The technique used was developed by early airmail pilot Howard Stark, who wrote a pamphlet on the "Stark 1, 2, 3 System" that was extremely influential to pioneering pilots including Charles Lindbergh. The system was used through the WWII, and taught pilots to:

- Start and stop turns with rudder pressure based on the turn needle indication;
- Bank and level the wings by centering the slip/skid ball when a turn stopped; and
- Control the airspeed with careful application of elevator based on the airspeed indicator's trend.

Now, I'm not saying World War II-era technique is superior to more modern methods. Far from it. But the skills that trained pilots in the 1940s made good IFR captains and can help fine-tune our skills yet today. And the turn-and-bank, slip/skid combination can be a lifesaver if the panel goes dark.