

Area of Operation **IX** - Task **B**

Approach with Loss of Primary Instruments (Partial Panel)

Content

1. Introduction
2. Recognizing Failures
3. Transition to Partial Panel & Approach



Key References:

- Instrument Flying Handbook
- AIM

1. Introduction

- **What:** Review how to navigate/land while in a partial panel situation
- **Why:** Failure of instrumentation is a possibility and the pilot must be able to deal with a partial-panel emergency
- **Main Types of Failures**
 - Loss of Gyros (e.g. Vacuum failure)
 - Loss of AHRS
 - Loss of PFD
- **What to Do:**
 - Troubleshoot/Identify (if time permits)
 - Consider options:
 - ✓ Switch to backup instruments
 - ✓ Fly partial panel
 - ✓ Use MFD/Moving Maps
 - ✓ Transition to VFR
 - Notify ATC ----->
 - ✓ If this is an emergency, declare it
 - ✓ Let them know level of impairment and help needed (e.g. Vectors)



§ 91.187 Operation under IFR in controlled airspace: Malfunction reports.

- (a) The pilot in command of each aircraft operated in controlled airspace under IFR shall report as soon as practical to ATC any malfunctions of navigational, approach, or communication equipment occurring in flight.
- (b) In each report required by paragraph (a) of this section, the pilot in command shall include the—
 - (1) Aircraft identification;
 - (2) Equipment affected;
 - (3) Degree to which the capability of the pilot to operate under IFR in the ATC system is impaired; and
 - (4) Nature and extent of assistance desired from ATC.

2. Recognizing Failures

- **Gyro Failure (Analog cockpit)**
 - Usually related to Vacuum pump failure
 - Loss of Attitude Indicator and Heading Indicator
 - Red flag on the instrument, Vacuum gauge out of range
 - May go unnoticed for a while
 - ✓ As suction is lost, gyros slowdown and became inaccurate
 - ✓ Many GA aircraft do not have warning for Vacuum system failure
 - ✓ Cross Check instruments → if they don't agree, you have a failure



- **AHRS Failure (Glass cockpit)**
 - Loss of Attitude Indicator, Heading Indicator and Turn Coordinator
 - Red “X”, lack of markings on the HSI



Note: in HSI systems, Navigation Needles may still work even though the heading indicator does not (depend on each system)

3. Transition to Partial Panel & Approach

- **Ignore Failed Instruments**

- **Start Partial Panel Scan**

- Pitch → Altimeter, VSI, Airspeed Indicator
- Bank → Turn Coordinator (if available)
- Heading → Magnetic Compass

If you are using Backup (e.g. PFD/MFD or Backup Instruments):

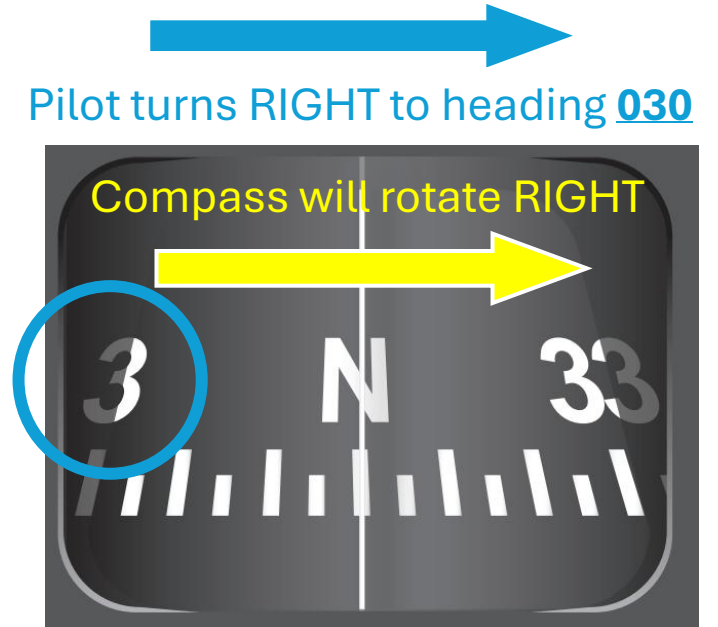
- Cross check will be different and less efficient (if not trained often)
- Be mindful of the Coriolis Effect (human factors) causing disorientation

- **Small and smooth control pressures**

- Small control input to stop needle movement
- Small pitch change to return to desired altitude

- **Recommendations when Flying an Approach**

- Select a simple approach
- Request vectors to final
- MFD: use “Track up” to follow the line and maintain course
- Set a compass heading and use small inputs
 - ✓ Pilot must turn **OPPOSITE** to the desired heading mark
 - ✓ Be mindful of compass errors



Questions?

