

The F-16 AoA system (United States Air Force, 2002) consists of an indicator located on the instrument panel, an indexer located on the top left side of the glareshield and the HUD AoA display (Figure 18). The AoA indicator displays AoA in true degrees on a vertically moving tape indicating -5 to +32 degrees. Color coding from 9 to 17 degrees corresponds to the color coding on the AoA indexer. The AoA indexer provides a visual indication of aircraft AoA by illuminating either one of the chevrons or the circle. The indexer operates continuously with the landing gear handle up or down. The HUD display uses an AoA bracket when the landing gear is lowered. When the flightpath marker is even with the top of the bracket, the AoA of the aircraft is 11 degrees. When the flightpath marker is in the middle of the bracket, the AoA of the aircraft is 13 degrees and when the flight path marker is even with the bottom of the bracket, the AoA of the aircraft is 15 degrees.

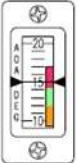
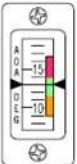
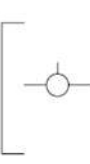
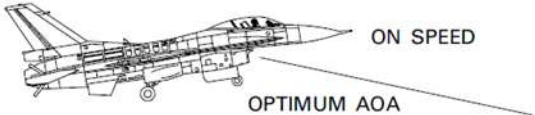
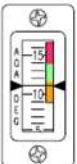
INDICATOR	INDEXER	HUD DISPLAY	ATTITUDE
 15	(RED) 		 SLOW HIGH AOA
 13 (GREEN)			 ON SPEED OPTIMUM AOA
 11 (AMBER)			 FAST LOW AOA

Figure 18: F-16 AoA Display System (United States Air Force, 2002)

4.3 Commercial Transport and Business Aircraft AoA Indicators

Cessna offers an optional AoA indicator and indexer on their Citation X Model 750 (Figure 19). The indicator is standardized from 0 to 1.0, and contains colored arcs (Cessna, year unknown). The green arc, located from 0 to 0.60, represents normal operation. The yellow arc, located between 0.60 and 0.80, represents the area where the aircraft may be approaching the critical AoA. The yellow arc also contains a symbol between 0.55 and 0.65 and represents the optimum landing approach airspeed. The red arc, from 0.80 to 1.0, represents where low speed buffet may occur and if uncorrected, could continue on to a full stall. The stick-shaker activates around 0.83 +/-0.02. This information is valid for all aircraft configurations and weights. The Cessna approach indexer is mounted on the pilot's glareshield and uses three lighted symbols to indicate one of five AoA conditions. When lit, the top chevron, colored red, indicates a high AoA. This chevron points down to indicate that the AoA should be decreased. A slightly

high AoA is indicated when the top chevron and the green circle are lit. Only the green circle lights up when the AoA is on the optimal approach reference. A slightly low AoA is indicated when the circle and bottom chevron, colored yellow, are lit. The bottom chevron lights up when the AoA is low. This chevron points up to indicate that the AoA should be increased.

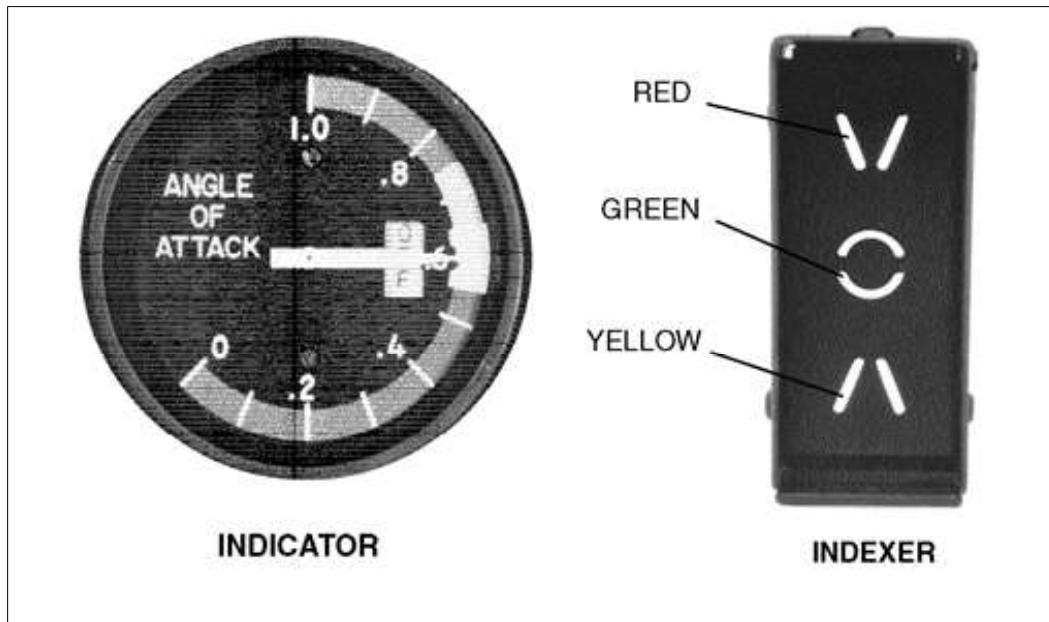


Figure 19: Cessna AoA Indicator and Indexer (Cessna, undated)

Airbus offers an optional AoA indicator on the A340 that provides the crew the true AoA between -5 and +25 degrees (Figure 20). There is an indicator on both the Captain and First Officer side; they are fed directly from the air data inertial reference unit on the corresponding side. In the event of failure of the AoA system, the pointer is positioned at the lower stop and an amber warning flag appears (Airbus, 1995).

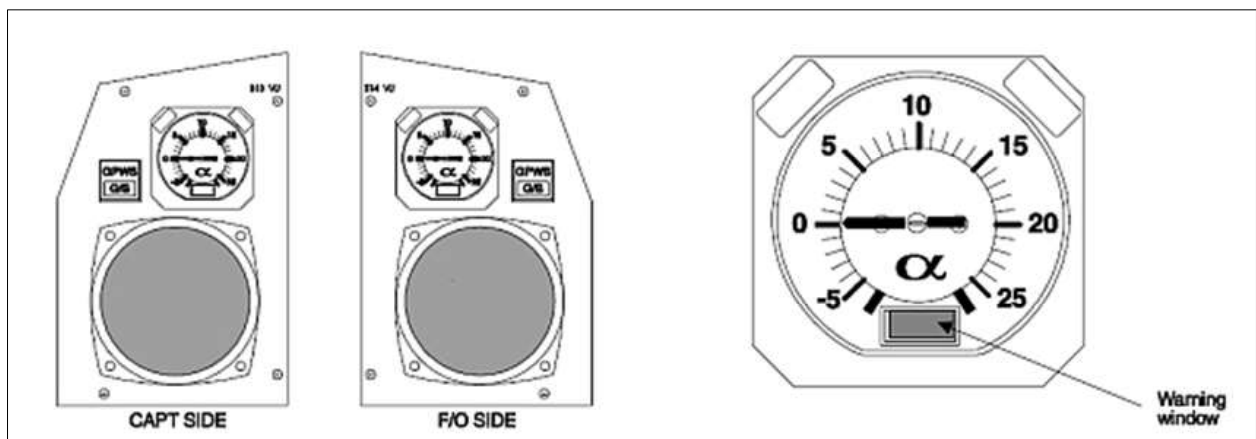


Figure 20: Optional Airbus AoA Indicator (Airbus, 1995)