

Major components of an FDS include an ADI, also called a Flight Director Indicator (FDI), an HSI, a mode selector, and a flight director computer. It should be noted that a flight director in use does not infer the aircraft is being manipulated by the autopilot (coupled), but is providing steering commands that the pilot (or the autopilot, if coupled) follows.

Typical flight directors use one of two display systems for steerage. The first is a set of command bars, one horizontal and one vertical. The command bars in this configuration are maintained in a centered position (much like a centered glideslope). The second uses a miniature aircraft aligned to a command cue.

A flight director displays steerage commands to the pilot on the ADI. As previously mentioned, the flight director receives its signals from one of various sources and provides that to the ADI for steerage commands. The mode controller provides signals through the ADI to drive the steering bars, e.g., the pilot flies the aircraft to place the delta symbol in the V of the steering bars. “Command” indicators tell the pilot in which direction and how much to change aircraft attitude to achieve the desired result.

The computed command indications relieve the pilot of many of the mental calculations required for instrument flight. The yellow cue in the ADI [Figure 5-39] provides all steering commands to the pilot. It is driven by a computer that receives information from the navigation systems, the ADC, AHRS, and other sources of data. The computer processes this information, providing the pilot with a single cue to follow. Following the cue provides the pilot with the necessary three-dimensional flight trajectory to maintain the desired path.

One of the first widely used flight directors was developed by Sperry and was called the Sperry Three Axis Attitude Reference System (STARS). Developed in the 1960s, it was commonly found on both commercial and business aircraft alike. STARS (with a modification) and successive flight directors were integrated with the autopilots and aircraft providing a fully integrated flight system.

The flight director/autopilot system described below is typical of installations in many general aviation aircraft. The components of a typical flight director include the mode controller, ADI, HSI, and annunciator panel. These units are illustrated in Figure 5-40.

The pilot may choose from among many modes including the HDG (heading) mode, the VOR/LOC (localizer tracking) mode, or the AUTO Approach (APP) or G/S (automatic capture and tracking of instrument landing system (ILS) localizers and glidepath) mode. The auto mode has a fully

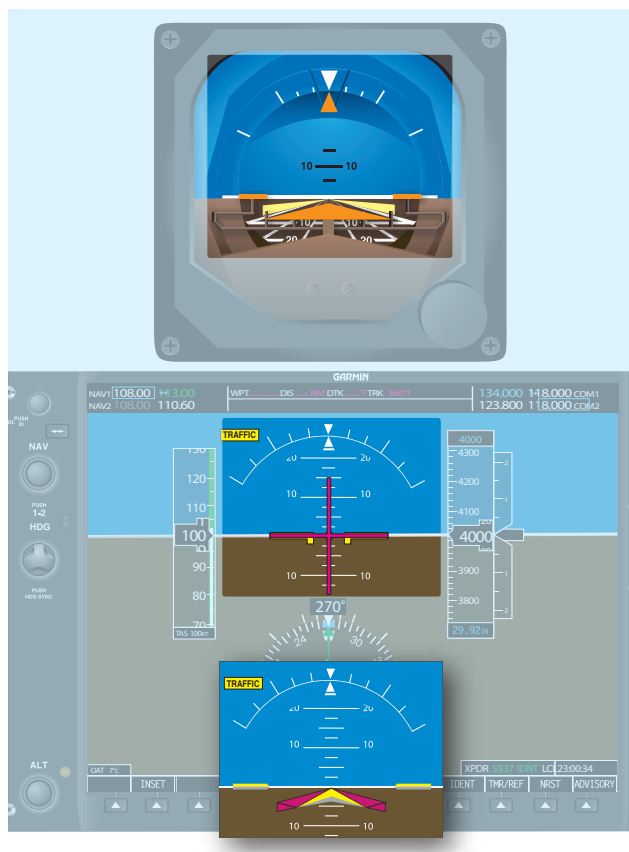


Figure 5-39. A typical cue that a pilot would follow.

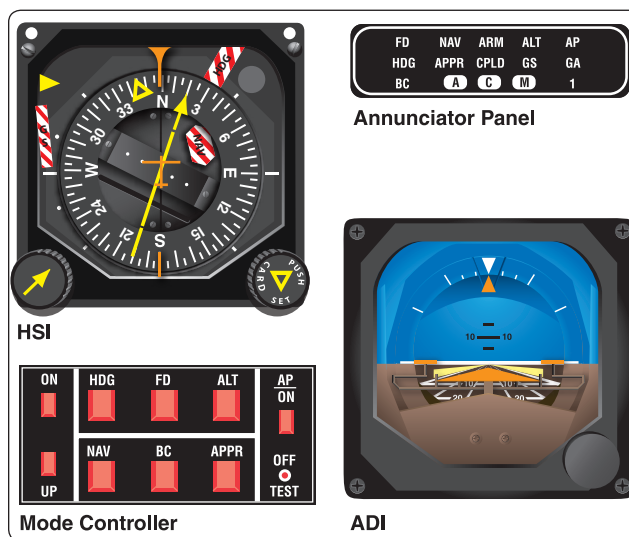


Figure 5-40. Components of a typical FDS.

automatic pitch selection computer that takes into account aircraft performance and wind conditions, and operates once the pilot has reached the ILS glideslope. More sophisticated systems allow more flight director modes.