

Figure 16-11. Multifunction Flight Display (MFD)

The navigation source displayed near the left center of the MFD is controlled by:

- The navigation source on the PFD, and
- The display format selected for the MFD.

If the navigation source of the PFD is VOR or LOC, these sources are repeated on the MFD if the format is a full compass rose or an arc without a map (a stick airplane shows). If the navigation source of the PFD is FMS, or if either the PPOS map or the PLAN map are selected for display on the MFD, then the FMS is the MFD navigation source.

The lower portion of the MFD usually is a map, either PPOS (heading up) or PLAN (north up). It also can be a traffic collision avoidance system (TCAS) or graphic weather display. To select a choice, push the unlabeled blue caret at the top right line select key. This provides a LOWER FORMAT menu; simply push the same button to make a choice (blue is active; white is available).

is available). More information on this menu is found in the FMS section of this chapter.

Between the engine data and the map is a window where you may display text data from the FMS. The unlabeled blue caret at the top left line select key controls this display text data. This provides an UPPER FORMAT menu; simply push the same button to make a choice (blue is active; white is available). More information on this window is found in the FMS section of this chapter.

Should the MFD symbol generator fail, the display goes entirely blank. The pilot can select the REV TO PFD position of the display knob below the PFD (see Figure 16-3). This moves the engine data to the top of both PFDs in a compressed format.

FLIGHT GUIDANCE SYSTEM

The flight guidance system is a combination of the autopilot, its two flight guidance computers (FGCs), AHRS 1 and 2, and ADC 1 and 2. The course/altitude/heading controls and the flight director mode select panels are also part of the system. Only one FGC can control the aircraft at any time; yet, the other is operating. A filled-in arrow near the top of the PFD shows which side is in control. The system initially powers up with the left side in control. Swap the FGC by pressing the AP XFR button on the autopilot panel. The FGC in control also defines which ADC altitude encoder is normally used for the transponder.

AUTOPILOT

The autopilot provides pitch, bank, and yaw damping commands to its two FGCs. To do this, both AHRS are required to be valid with no miscompares of attitude. The autopilot also trims the elevator. The control panel is at the aft end of the center pedestal (Figure 16-12). To engage the autopilot, move the AP lever forward. If it magnetically remains in

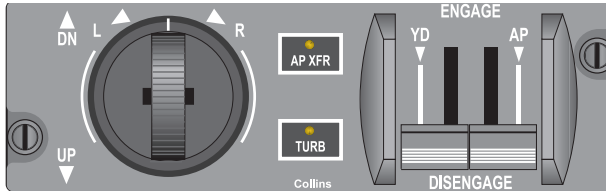
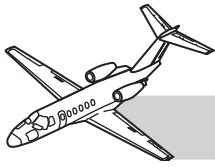


Figure 16-12. Autopilot Panel

place, the autopilot self-test is good. A green AP (just above the arrow at the top of the PFD) indicates the autopilot is on.

The autopilot should be tested prior to flight; however, the *AFM* does not contain procedures. Engage the autopilot and test the roll and pitch servos by commanding bank and pitch changes. Using one of the several methods to disengage the autopilot ends the test.

Normal autopilot disengagement (by pilot action) results in a single tone or verbal alert. This is done by:

1. Lowering the AP lever
2. Pressing the red AP disconnect button on the yoke (this also disengages yaw damper)
3. Activating electric elevator trim
4. Pressing the left throttle go-around (GA) button
5. Lowering the yaw damper (YD) lever

Abnormal autopilot disengagements may result in repeated alerts. Pressing either red disconnect button on the yokes cancels this alert. Abnormal disengagement is done by:

- Stick shaker
- Yaw damper or internal autopilot failure
- AHRS failure or miscompare
- Loss of power to the normal (main) DC buses
- Excessive attitudes

The autopilot and yaw damper must be off for takeoff and landing. The minimum altitudes for autopilot operation are:

- 240 feet AGL for engagement after takeoff or go-around
- 1,000 feet AGL for cruise
- 240 feet AGL for nonprecision approaches
- 70 feet AGL for ILS approaches

The autopilot follows the active commands set on either flight director mode select panel, by the go-around button on the left throttle, or by basic roll and pitch. It is strongly advised to have the aircraft near trimmed flight prior to engaging the autopilot to preclude abnormal attitudes and large trim changes. It is not recommended to use the autopilot while climbing at V_2 with one engine inoperative. Rudder trim can be changed with the autopilot on, provided it is done smoothly.

The roll knob on the panel allows the pilot to select from 5° to 32° of bank. Moving the knob out of the center detent disengages any other lateral flight director mode. The knob is not spring-loaded to return to the center detent.

The pitch wheel inside the knob changes pitch angles (PTCH mode), vertical rate speeds (VS mode), or indicated airspeeds (FLC mode). The wheel is spring-loaded to return to a center position.

The AP XFR button allows the pilot to connect the autopilot to either the left or right FGC.

The TURB button reduces autopilot gains during rough air flight. The mode automatically terminates during ILS approaches; it remains on for VOR and FMS approaches.

The autopilot does not engage if pitch is greater than 25° noseup, greater than 15° nosedown, or greater than 45° of bank.