

Autopilot Operations

KAP-140

Most of this assumes that altitude pre-select is available – in some aircraft that's not an option (single or dual axis). Some aircraft will have an altitude hold (dual axis), some don't have anything (single axis). In those cases you may need to adapt the procedures appropriately.

Limitations

- Not to be used during takeoff and landing.
- Pilot in the left seat must have seat belt fastened.
- Pre-Flight Tests must be completed.

Pre-Flight Tests

See POH supplement.

- System self-test OK – no annunciators.
- Engage and ensure can be over-ridden.
- Test heading select (if installed).

Emergency Shutdown

Know the methods to remove power/disengage the auto-pilot:

- AP button
- Trim Interrupt
- AP Circuit Breaker
- Avionics Master
- Aircraft Master

Normal Operation

Normal operation is climb, cruise and descent.

Operations to review:

- Engaging auto-pilot. Initial modes – ROL, VS
 - You probably want at least HDG – you may want ALT (if already level).
 - Which leads to – always set the HEADING BUG.
- Altitude Intercept – ALT ARM
- Starting a Climb/Descent
- No auto-throttle – so throttle controls airspeed.
- NAV mode
 - Review intercept process – 45 degree intercept and “any angle” intercept.
- Things to watch for:
 - If you have altitude pre-select make sure ALT(ARM) is selected when you want it to be. It's easy to assume it'll intercept an “assigned” altitude.

- When ALT is the operating mode the aircraft maintains the current altitude – so when you press ALT it maintains the current altitude REGARDLESS of the altitude shown in the pre-select.

Approaches

Sometimes the best thing to do is use the HDG mode. The auto-pilot will do lots of tricks, but if you don't remember how to get it to perform them it can do surprising things. In HDG mode it almost never surprises you.

ILS Approaches - Vectors

The most common “other” mode that's useful.

- Remember this sequence:
 - HDG (to put the AP in ROL mode, if you're in NAV you may need to hit HDG twice – out of NAV into HDG and then out of HDG into ROL).
 - Move the bug to the inbound course.
 - APP (to put the AP in Approach mode).

So once you're set up on the intercept heading (assuming vectors to final) follow the 3 magic steps and you're in business.

Things to watch for:

- Tight turn-on to final – the AP may have trouble intercepting.
- Turn through final – in the ROL mode type approach the AP WILL NOT intercept from the “wrong side”, you need to go back to HDG, setup a new intercept and then use the 3 magic steps.
- GS intercept from above – it will do it but it doesn't like it.

ILS Approaches – Outbound or Back Courses

Remember this:

- The HEADING BUG and the OBS has to be on the INBOUND (front) course!
- Otherwise it just works the same as any other normal intercept – use the magic steps but the LAST step will be REV (not APP).

Other Approaches

- You can use APP for a finer granularity in following the navigation signal.
- Careful using VORs – especially if you're going to cross the VOR, scalloping and the zone of confusion will send the AP into a state of confusion.
- ALTITUDE MANAGEMENT – can become over-whelming, especially in an approach with a number of step-downs – DO NOT DESCEND BELOW MANDATORY ALTITUDES – if it's over-whelming stay high and go missed if you have to.

Missed Approach

- Always disengage the auto-pilot and hand-fly the initial stages.
- Once stabilized you can ensure you have the right information set (HEADING BUG, ALTITUDE etc.) and re-engage the auto-pilot as required.