

Beverley AILA ILS and GCA Manual

The Beverley aircraft uses a special gauge setup that allows both Instrument Landing System (ILS) and Ground Controlled (GCA) approaches. GCA was a revolutionary invention of the 1940's that enabled controllers to 'talk down' airplanes in difficult weather conditions. In order to simulate GCA in FSX/P3D the Beverley includes a hard-coded version of Karol Chlebowski's AILA (Airborne Instrument Landing Approach) gauge, adapted by permission of the author (see folder DOC for more details on the original AILA and its full functionality).

Quick Checklist

1. Set up AILA from approx. 20 miles out.
2. Select airport, runway, and runway end.
3. Check no potential terrain obstructions.
4. Call APC (Approach Pattern Control).
5. Proceed until handover to Precision Approach (PAR) or go ILS.

Setting up AILA



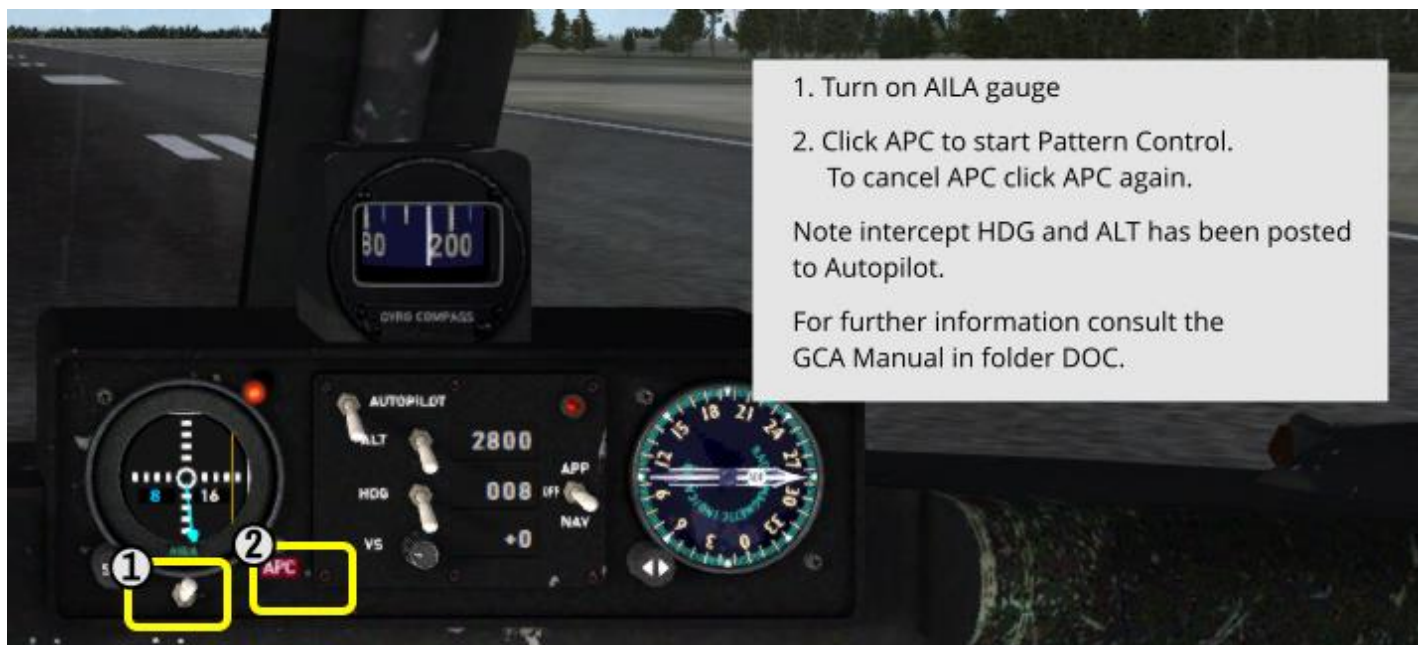
Step 1. Starting the setup. If the desired destination airport is not listed, the pilot can use the ICAO button to type in id letters. Any four-letter ICAO is selectable, even if thousands of miles away and irrespective of whether the airport has any predefined ILS runways or not.



Step 2: Pick a runway. KCEW only has one.



Step 3: Pick a runway end and close setup. Make sure the runway end shown is the one you want. Sometimes changing the runway end can lead to a more efficient approach pattern. Clicking the general area of the airport name opens an additional data sheet containing, among other things, wind velocity and direction, which might also be relevant to runway selection.



Step 4: Calling Approach Pattern Control.

If you turn on the AP's ALT and HDG switches you can let the autopilot fly you all the way down to the runway threshold. This is a kind of 'auto-learn mode' -- and actually the best way to familiarize yourself with the overall process. Obviously, if the AP is turned OFF the pilot has to manage descent and heading instructions on his or her own. Note that, once active, the AILA gauge displays the direction to the intercept (blue arrow), distance to intercept (blue number 8) and distance to runway (white number 16). So, in the scenario pictured, the intercept is 8 miles in our back and we will have to make a u-turn to get to it. The posted HDG set of 008 will do that for us, and we will also have to climb to 2800 intercept altitude.

Approach Pattern Control

The general pattern for an approach to runway 27 is shown in the following diagram. Note in particular that APC will not be able to accept entry points that are marked red.

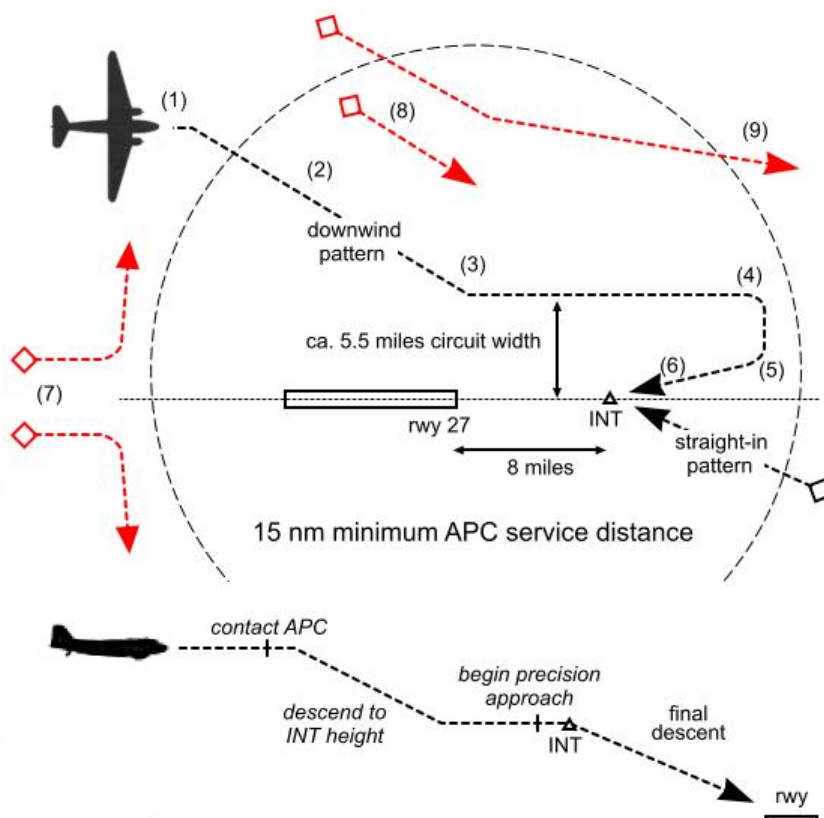
Approach Pattern Control (APC)

1. This is Approach Pattern Control. Standby for a downwind approach runway 27. When clear of obstacles descend and maintain XX feet intercept height. Turn right, heading XXX.
2. Fly heading [intercept heading].
3. [at 6.0 nm from centerline] Turn left downwind heading 090 [reciprocal runway heading].
4. [at 12 nm distance to runway] Turn right baseleg heading 180.
5. [at 1.6 nm from centerline] Turn right intercept heading XXX.
6. Standby for Final Controller.

7. For wider downwind circuit turn right/left ninety degrees for two and a half minutes. Re-contact APC when done. (Minimum circuit width = 7.5 nm.)

8. Approach Control is not available at your current distance from the airport. Minimum distance is 15 miles.

9. Radar contact lost, service terminating.



Terrain obstructions

APC’s initial warning *When clear of obstacles descend to intercept height* is of particular importance. Because APC has zero knowledge of possible terrain obstructions it is entirely up to the user to make sure that the pattern is a viable one. Internet resources such as [SkyVector.com](#) and [EuroControl](#) provide approach plates for most runways with ILS/VOR/GPS approaches which include 25 mile minimum safe altitude (MSA) information and other useful details.

For instance, suppose you are asking APC for vectors to runway 09 at Gibraltar AB (GBR). Here is a map view of the downwind pattern that APC will generate without a care in the world.



You better find out beforehand how high those mountains are, and whether it is even possible to avoid them. What you can do, within limits, is (a) change the intercept distance, or (b) change the glide slope angle via the AILA setup. Note that you cannot directly set an intercept height because that is determined by distance *and* angle, which APC must calculate for the pilot. If the result is unacceptable given the terrain conditions, quit APC and try entering other values in AILA, or maybe select a different runway.

APC will eventually position you close to the intercept at the correct altitude, at which point Alice terminates and hands you over to Alan, the Precision Approach Radar Controller, for the actual talk-down. Alternatively, at this point you may opt for a standard ILS approach, either following the AILA display manually or using an existing ILS frequency for a default Autopilot APP final. The following section will focus on the specifics of a PAR talk down.

PAR: Precision Approach

The PAR talk down is pretty straightforward with continuous instructions on headings, glidepath alignment, and distance from the runway. Even in auto-learn mode not everything is handled automatically: speed, flaps, and the final flare are the pilot’s responsibility -- auto-land this definitely isn’t! At 0.6 miles from the threshold, PAR will advise to “take over visually when you have the runway in sight”, and at this point it will force the Autopilot OFF (feel free to turn it off earlier using the switch or the **Z** key). PAR will officially terminate with the call “over the runway.”

To align on the glideslope, you can let yourself be guided by AILA’s crosshairs. In non-auto flight you need to trim your aircraft to maintain an appropriate glide slope angle (3 degrees default).

Given an approach speed of about 130 knots it is suggested to adhere to the following rules of thumb.

glidepath call	action
well above glidepath	sink -1300 fpm
above glidepath	sink -1100 fpm
slightly above glidepath	sink -900 fpm
on glidepath	sink -700 fpm
slightly below glidepath	stay level

below glidepath	stay level or climb +200 fpm
well below glidepath	stay level or climb +300 fpm

Unfortunately, PAR controller Alan can give no trend calls such as “slightly left of centerline and correcting,” as a real PAR controller would. However, the following pointers are fairly reliable:

course call	action/information
on centerline	fly runway heading (use exact heading, not runway number)
turn left/right 3 degrees	you are 80-180 feet off centerline
turn left/right 5 degrees	180-600 feet off
turn left/right 10 degrees	more than 600 feet off

Realism Challenges

Most of the processes described above can be executed in semi-automatic fashion using the Beverley’s Autopilot functions and requiring little or no hands-on interaction (except for things like speed and flaps). This isn’t, of course, what it was like in real life. Therefore, after having done a few practice runs in fair weather and become thoroughly acquainted with the overall logic of the APC and PAR interaction, you can make your life a whole lot more realistic and exciting. For instance, you could turn off the AP’s heading lock and/or the altitude lock and execute the controllers’ instructions solely by using the joystick and VC equipment. Additionally, you can, select various kinds of bad weather – down to the infamous zero/zero condition (zero ceiling, zero visibility), and the level of difficulty will rise dramatically.

Credits

“Alice” at fromtexttospeech.com (APC Controller’s voice); Alan G. Ampolsk (PAR Controller’s voice); Karol “COBS” Chlebowski (AILA gauge); Nick Cooper (testing and voice file laundering); Doug Dawson (sound gauge); Bill Douglas (Calclassic FS9 testing); Tom Gibson (AILA FS9 mods and testing); Tom Harnish (testing, research and documentation, tech support, videos); Manfred Jahn (GCA gauges); Ralf Scholten (compatibility testing).

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Manfred Jahn