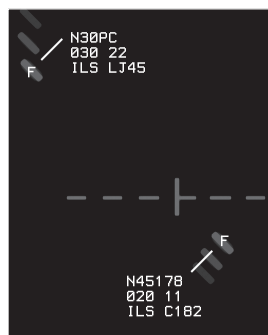


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WHY USE GPS OBS?

You don't need to be a Star Wars OBS-Kenobi to feel the power of OBS mode. Master it, and it will do almost magical things for you.

by Neil Singer

Most CFIs cover the OBS feature of most IFR GPS with a quick “you use it for holding.” But the true power of the OBS mode goes far beyond that.

Modern systems automate many of the occasions when OBS mode (or HOLD or other terms used in older navigators) is required. This prevents pilots from blowing a perfectly good approach. But, sometimes, even these newest-generation navigators need a little manual intervention.

Please Press Pause

The primary function of the OBS mode is to suspend auto-sequencing. With the exception of times when the navigator knows it needs

to pause on a waypoint (executing a procedure turn or reaching the missed approach waypoint), our GPS navigates from one waypoint to the next as they appear in the flight plan.

The most common time we need to suspend this automatic sequencing is an unexpected hold, such as an en route hold or an extra turn in a hold on the approach. Whether it's an ATC request or our own request to turn and lose some altitude, pressing OBS will pause the GPS on the holding waypoint, giving us guidance and distance information to it until we un-pause by pressing OBS again.

One trick is that with non-WAAS Garmin navigators, if we're holding at an FAF that uses a holding pattern in lieu of PT, it will be necessary to hit the OBS button every time around the hold. Instead of seeing “OBS” annunciated over the OBS button, we'll see “SUSP” (for suspend). This will extinguish each time we intercept the final course

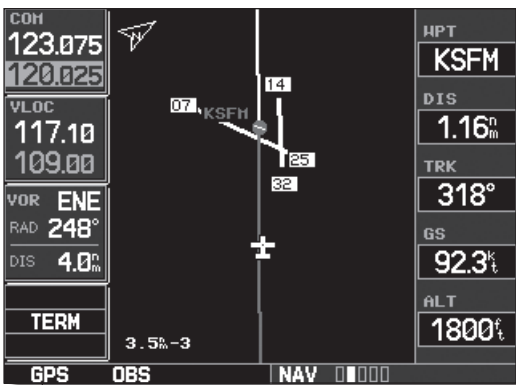
inbound, indicating that auto-sequencing has resumed, whether we want it to or not. With WAAS navigators, the unit will also annunciate SUSP, but will stay this way until the OBS button is pressed again.

Just as we use the OBS button to initiate a “pause” when needed, we also use it to initiate an “un-pause” when the navigator is responsible for the pause. This happens on every approach after crossing the missed approach point. The navigator does not sequence to the next waypoint in the approach, but annunciates SUSP and continues to provide guidance along the same course as the final approach segment, extended out into infinity. Once we have the airplane climbing and are ready to navigate as required by the missed approach procedure, we must hit the OBS button to “un-pause” and allow the GPS to sequence to the first waypoint in the missed approach procedure.

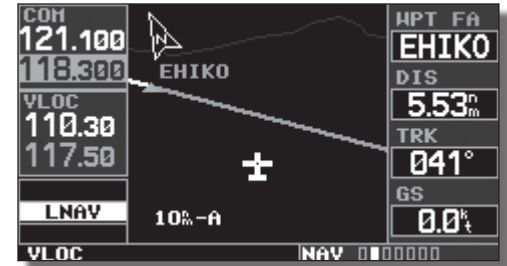
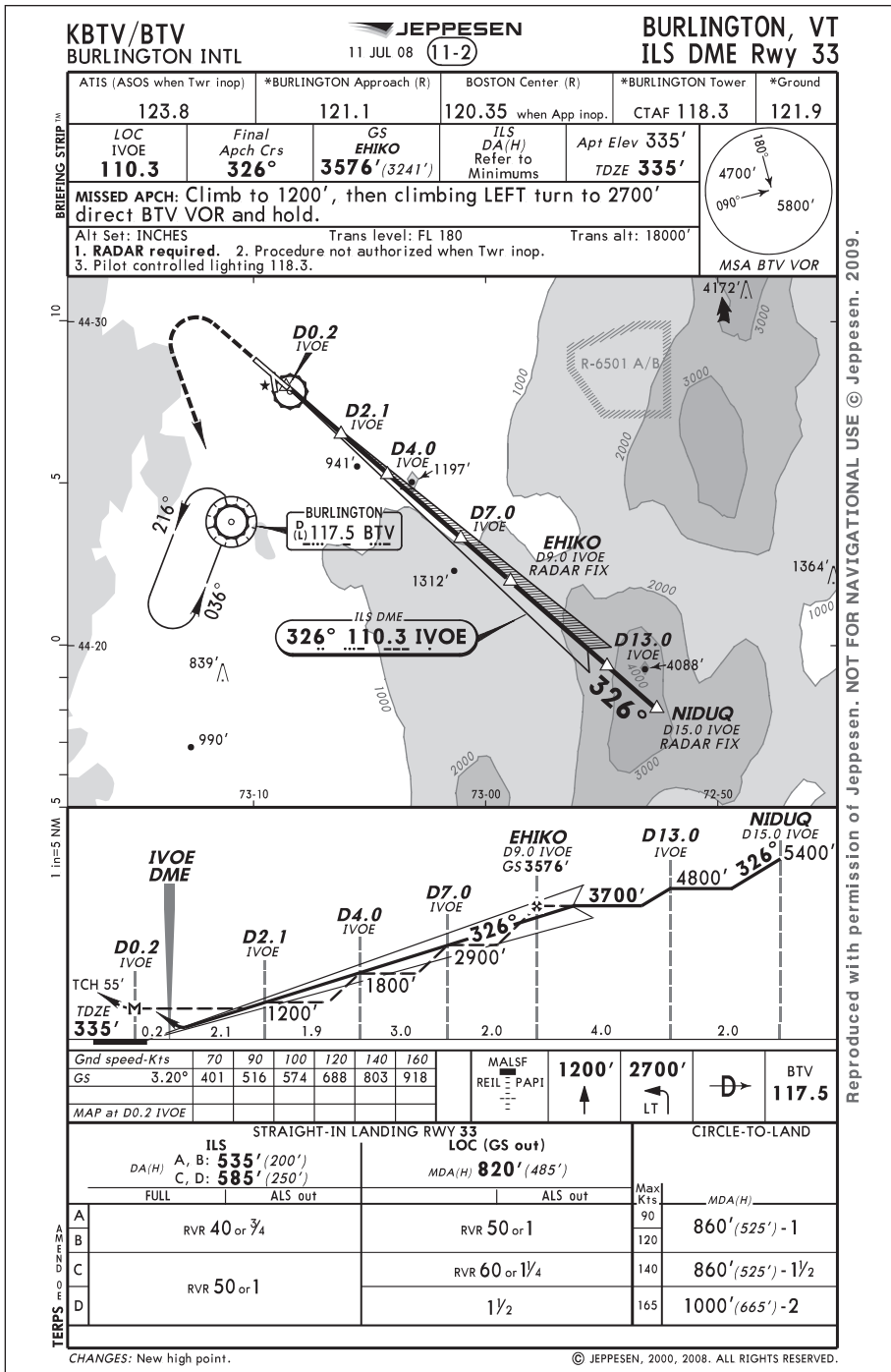
Sort-of Pseudo

A popular Flight Management System found in smaller turbine aircraft calls its version of OBS mode PVOR, for pseudo-VOR. That's a fantastic way of thinking of the second function of the OBS mode: allowing a pilot to turn any waypoint into a pseudo-VOR. This PVOR functionality is useful in situations where we want to select a specific course to or from a waypoint, rather than simply going directly to it.

One of most basic is when we want to navigate to or from an actual VOR on a specific course. Whenever permissible, we'd like our guidance coming from our GPS, rather



Left: Flying runway heading to the airport is really flying to the airport reference point, which may not be on a runway. Also, the GPS computes magnetic variation on the fly and may not completely agree with the magnetic alignment of the runway. So, even if you input the precise magnetic alignment of the runway, you may be paralleling the runway or on a slight angle.



Activating vectors-to-final removes all waypoints except EHIKO (top). Direct CF33 (the DME 13.0 fix) in OBS mode with 326 set on the CDI (middle) keeps the waypoints, but you won't engage approach mode until passing CF33. You'll also need to unsuspend to resume waypoint sequencing. Activating the leg NIDUQ ⇌ CF33 (bottom) only highlights the leg between the two waypoints.

than from the VOR radio signal. Using GPS means better accuracy, a "steadier" signal and, in many installations, GPS roll-steering for the autopilot. That last item enables rock-steady course tracking even in the strongest winds.

Another handy use of PVOR is visual approach guidance to any runway, regardless of whether there is a published approach. After selecting OBS mode, we select a course matching the runway.

If we want to be precise, we can use the exact runway alignment, — such 316 degrees for Runway 32— but it's often not worth the trouble because the guidance is really only an approximation. But for approaching an unfamiliar airport, especially at night or in low-visibility conditions, having "good-enough" lateral guidance to the runway, as well as an approximate final approach course drawn on a moving map, is a great feature even accepting the slight in-

herent inaccuracies. And unlike the runway extensions shown on some moving maps (which are aligned better with the actual runways), your autopilot can fly the OBS version and leave you more brain power for last-minute, pre-landing tasks.

A last example of an occasion to use PVOR functionality is an alternative to the vectors-to-final mode (VTF) on an approach that features step-downs outside the FAF. Activating VTF makes the FAF the active waypoint and removes all fixes before from the flight plan and the display. If we need to know when we've crossed a fix prior to the FAF, we'd need to look at the distance from that

YOU GOTTA KNOW WHEN TO PUSH AND WHAT TO TWIST

To enter or exit the OBS mode, only a single button push is required. On Garmin GNS 400/500 series units, the button is on the face of the unit, while with G1000 installations, it is a “soft key” only visible when viewing the top-level menu on the PFD. The 400s/500s annunciate OBS mode directly above the OBS button, while G1000s annunciate in the middle of the HSI. With legacy units OBS is selected by an external, two-position switch, usually mounted close the pilot’s instrument scan. The switch also serves as a mode annunciator.

Once OBS mode is entered, nearly all navigators allow for manual course selection via the HSI or OBS knob. The GPS will function just like a VOR: If the pilot spins the HSI course to 270, guidance will be given relative to that course. The magenta course line will rotate on the moving map and the desired track field on the GPS (DTK) will change.

A few legacy units have what are called “resolverless” installations. This means the communication is from GPS to HSI only and you have to set the course on the GPS unit itself when in OBS mode. This method is also required by Garmin/Avidyne Entegra combination when using VOR/Localizer guidance (VLOC mode). Pressing OBS on the GPS makes a pop-up menu appear on the Garmin asking for your course selection. Some turbine aircraft installations of the Garmin GNS 400/500 work similarly.



The selected course will be drawn on the Garmin’s moving map page, and will change as the course is changed. While in OBS mode, the selected course to the waypoint is drawn in magenta and the course *from* the waypoint is shown in white. If OBS mode is exited, the magenta segment will remain; however the white segment will disappear. This can be confusing when tracking a radial outbound from a VOR, as there will not be a course-line drawn under the airplane. The HSI or CDI will, however, still display correctly. Of course, if you activate or resume a flight plan, the guidance will return to normal.

In installations with an Avidyne MFD, the MFD will not show any course line while the GPS is in OBS mode. Once OBS mode is exited, it will show the same picture as the Garmin’s moving map, a magenta line that terminates at the active waypoint until you activate a flight plan or other direct-to navigation. One last tip for Avidyne users: If you go direct to a waypoint on a selected course instead of OBS mode, that will appear on the MFD, but only as a magenta “to” course. —N.S.

fix to the FAF, which requires some quick math at a busy time.

Imagine we’re flying the ILS 33 to Burlington, Vt., (KBTV, see previous page). There are two stepdowns prior to joining the glideslope outside EHIKO, one at 13.0 DME, the other named as NIDUQ. Activate the approach with NIDUQ as the transition, then via OBS, select a course of 326 to NIDUQ. We now have the final approach course drawn on our moving map with the stepdowns displayed. If you’ll intercept somewhere further down the pike, you can choose a later waypoint, such as the DME 13.0 fix. Another method is to go direct to NIDUQ but on a course of 326—kind of a temporary OBS mode until we cross NIDUQ.

For That eBay Steal

Most IFR GPS units made prior to the Garmin 430 require manual suspension much more often.

The first of these is an approach with a course reversal because we cross the same fix twice. First we need to press OBS before crossing the defining fix outbound, so as to pause on that waypoint. Next, if executing a PT, we must manually select the outbound course. Then we fly our reversal, manually select the inbound course and press OBS again to un-pause—quite a bit of work and opportunity for error.

A second occasion is when flying an approach via vectors-to-final. As far as auto-sequencing is concerned, passing abeam an active waypoint is as good as flying over it. Without pausing the flight plan, the GPS would sequence from the FAF to the MAP once we pass abeam the FAF on our downwind vector.

Once turned inbound, OBS must be pressed again so that the navigator *will* sequence to the MAP after crossing the FAF. Forgetting either

results in frenzied button pushing to reactivate the correct leg of the approach.

If a missed approach is executed with a legacy navigator, the pilot will need to use the OBS mode at least once, and possibly twice. If the missed involves flying a specific course to the missed approach holding point, rather than simply direct, the pilot must enter the OBS mode for manual course selection. In all cases, OBS mode must be used to select the inbound holding course.

Use the Force

Once you master OBS mode, it’s a “How did I get along without this?” kind of thing. Work OBSing into your routine and you’ll have this powerful tool at your ready command.

Neil Singer is regular contributor to IFR.