

PFD Failure Navigation Drills

TKE (Track Angle Error)

The TKE field on our Garmin 430 is an overlooked, but highly useful, piece of information in the event of a PFD failure. It displays the numerical difference between TRK (Track) and DTK (Desired Track), with an arrow to indicate the direction of turn required to remove this difference.

So if our actual track is 085, and our desired track is 090, we would have a TKE of 005➔, as we need to turn 5 degrees right to match TRK and DTK. Note that the TKE field is unaffected by our deviation from course, so a TKE of 000 is not always desirable. For example, when we are intercepting a course, the TKE will equal our current intercept angle. Again, a TKE of 000 does not imply that we are on course, simply that our track is parallel to the course.

When TKE is not 000, the arrow will point in the direction of CDI movement. With a TKE of 001➔, the CDI will move very slowly to the right; with a TKE of ◀060, the needle will move relatively quickly to the left. Knowing this, we can learn to quickly visualize our orientation to our desired course, and easily make necessary corrections:

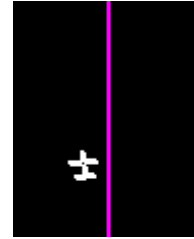
- If our CDI is right of center, any TKE with a right arrow is undesirable.
- If our CDI is left of center, any TKE with a left arrow is undesirable.
- If the needle is centered, any TKE but 000 is undesirable.

For the following pages, cover the right half of the sheet, and look at the NAV 1 page depicted on the left column. Assuming our goal is always to intercept and/ or maintain the course center:

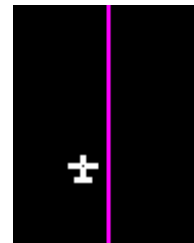
- Decide if the situation depicted is good or bad.
- Decide why it is good or bad.
- Attempt to visualize the orientation of the aircraft to the course line.



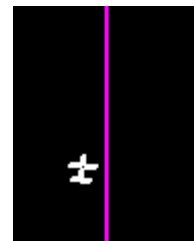
BAD
Off course, and heading further off course



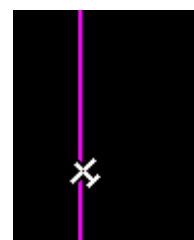
BAD
Off course and paralleling course



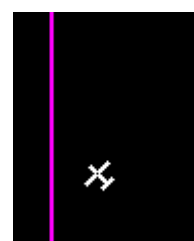
GOOD
Correcting towards course with small intercept angle



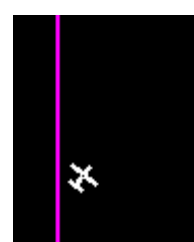
BAD
Too large of an intercept angle for a course which is nearly centered



GOOD
45 degree intercept. Note that "1.1" on left of CDI signifies the needle will come into view immediately, and we should begin to turn right to decrease intercept angle.



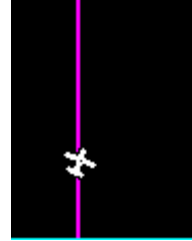
BAD
We have flown through the course, and are flying away at a large angle.





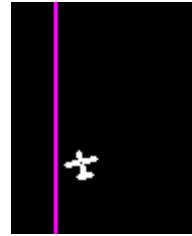
BAD

Needle is essentially centered and we are diverging..



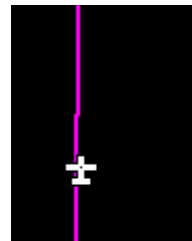
BAD

Intercept is slightly too large for course which is nearly centered.



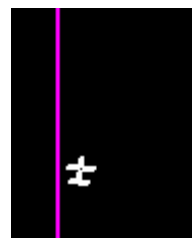
GOOD

Slightly off course and making small correction back towards course



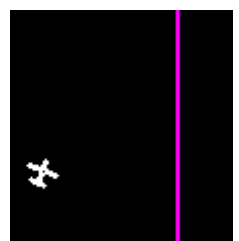
BAD

Off course and heading further off course



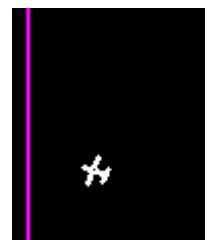
BAD

We are still 2.9 miles off course and are only intercepting with 21 degree angle, need to turn further right



BAD

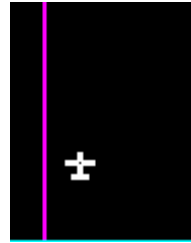
We have both a large intercept angle and a high ground speed. Course will come in very quickly and we will be prone to overshoot.





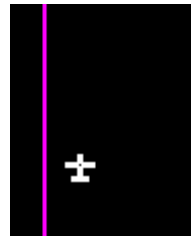
BAD

Need more intercept for needle which is nearly full scale deflected



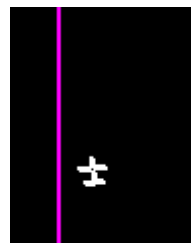
BAD

Off course, paralleling course



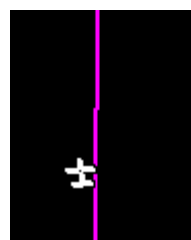
GOOD

Off course, correcting with small intercept angle



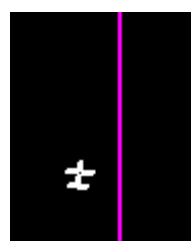
BAD

Off course, diverging from course



GOOD

Off course, correcting with small intercept angle



GOOD

Off course, correcting with medium intercept angle

