



DIRECT TO A VOR

1. Introduction

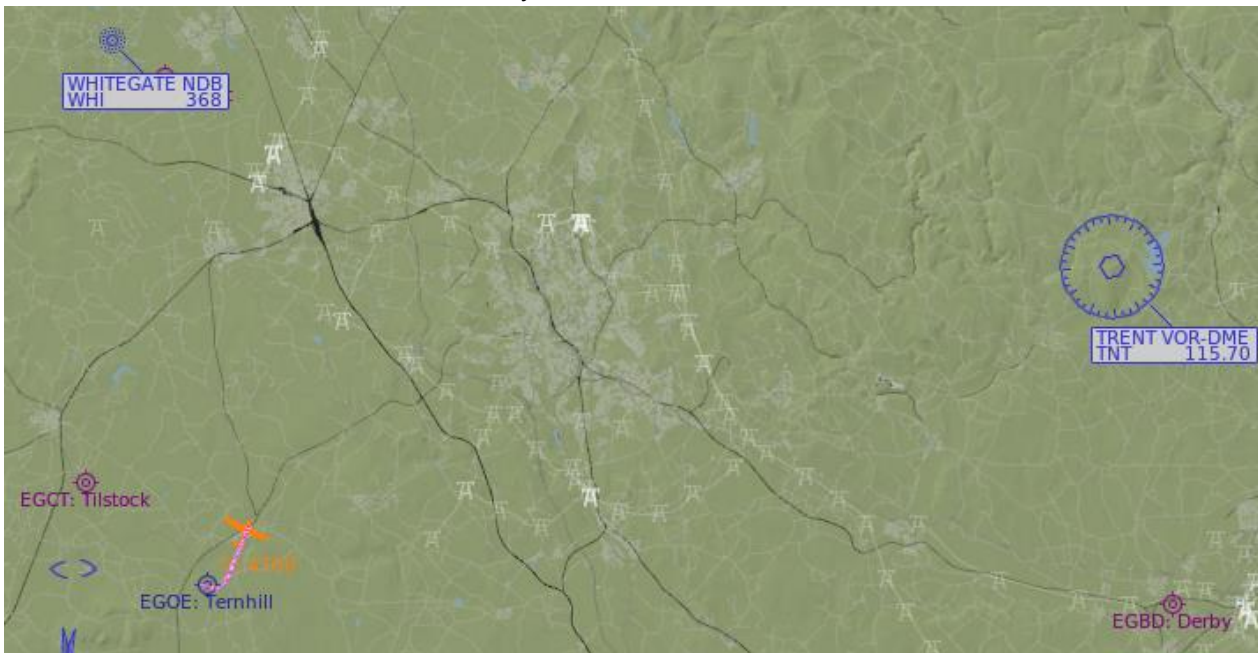
This document presents a practical method to use the VOR receiver in a Cessna 172 aircraft to make a direct to a VOR – VHF Omnidirectional Range.

A VOR is a beacon which can help the pilot to navigate along great distance.

2. Chart

This is a chart showing:

1. the aircraft coloured in orange
2. VOR – DME : TRENT TNT 115.7MHz
3. NDB : WHI 368kHz
4. Airfields: EGOE Ternhill ; EGBD Derby ; EGCT Tilstock



The purpose of the example is to go direct to the TNT VOR from the present position

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3. VOR receiver

The basic Cessna 172 has a VOR rotatable course display indicator - CDI.

The standby position of the instrument when the aircraft does not receive any signal from any VOR is like this picture:

- NAV red flag (NAV, NAV1 or NAV2) is visible
- GS red flag can be visible if your instrument is capable to receive an ILS glide path

If you do not receive a VOR, you must check that:

- You are not tuned to the right frequency (do not mix up 2 VOR indicators)
- You are out of range



When the aircraft does receive any signal from the tuned VOR, the instrument is like this picture:

- NAV red flag is not visible
- GS red flag can be visible if your instrument is capable to receive an ILS glide path



Using a VOR, you can track a specific magnetic radial to the VOR beacon.

This radial is shown on the top of the instrument indicated by the yellow arrow:

- The instrument indicates 22 = 220° radial.



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4. Tune cockpit

The first step for the pilot is to tune the instruments:

1. Tune the VOR frequency on the NAV frequency selector of your choice
2. Verify that the VOR instrument is updated (arrow moved from standby position to the beacon)

After tuning the VOR frequency, the red flag must disappear.



The VOR can sometimes be received at great distances. It is very important to verify the Morse-code identifier of the station to be certain you are navigating from the right beacon

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5. Tune the course on navigation instrument

There are different ways to make a direct to a VOR but, we will give you one of the simplest methods.

The simplest method is to search with the navigation instrument which radial you are currently on.

- 1) Turn the OBS selector



- 2) Turn until you will have the white triangle pointed to the **TO** mark and Turn until the vertical needle is centered.



BAD: needle centred but indicator shows FROM



BAD: TO indicator is showing but needle not centred



GOOD: well done: TO indicator and needle centred

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6. Turn to the beacon

When your instrument is tuned, just take the course indication of your instrument and, turn your aircraft toward this course: Heading = Course.



In our example, Course is 80, aircraft turn to 080° heading.

After this turn, the needle, like our example above, can move a little to the right or to the left.

You can make some little adjustment:

- 1) Centre the NAV needle using OBS navigation button again
- 2) Set heading to the new course indication on your instrument

One minute after this manoeuvre, we can see the progress of the aircraft on the charts:



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7. Mind the wind effect

The VOR navigation using CDI and course selector is precise. If there is a crosswind component, the aircraft may leave the radial (aircraft is 'pushed' by the wind off the selected radial).



In order to keep the same radial, just perform small adjustments using your heading only!

- 1) Turn in direction of the needle (in our example to the right) in order to centre the needle.
- 2) When the needle is centred, adjust your heading again to the selected navigation course.

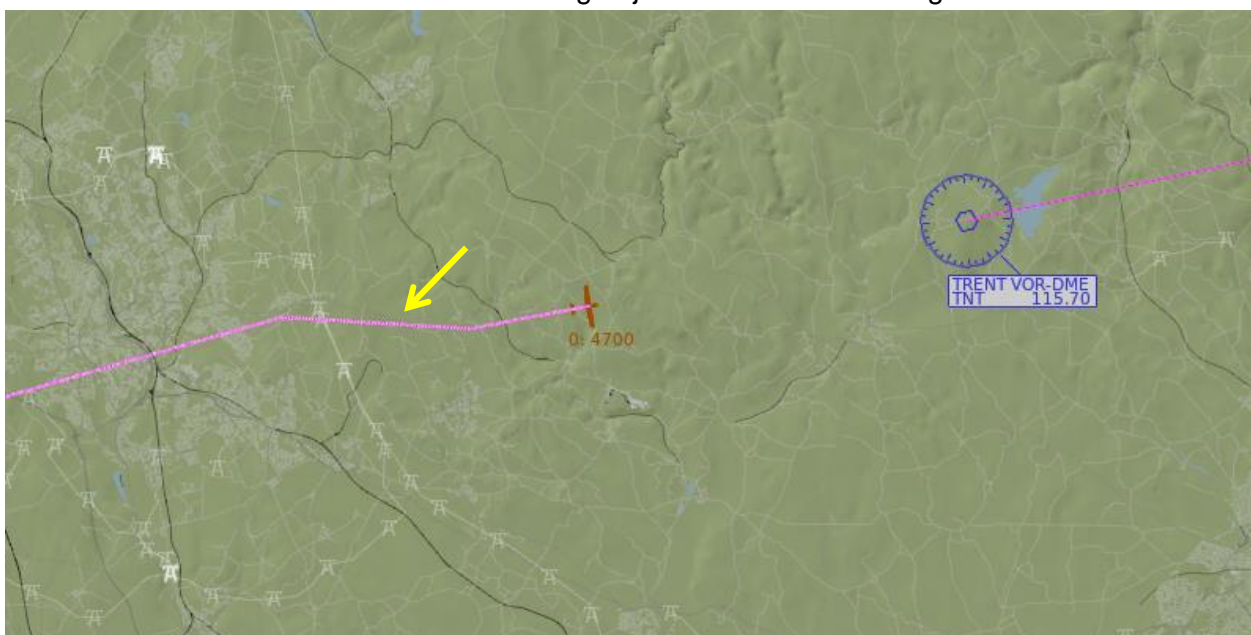
Of course, you can compensate for the wind effect by selecting a new heading.



After aircraft manoeuvre and having added some degrees in the heading to compensate wind.

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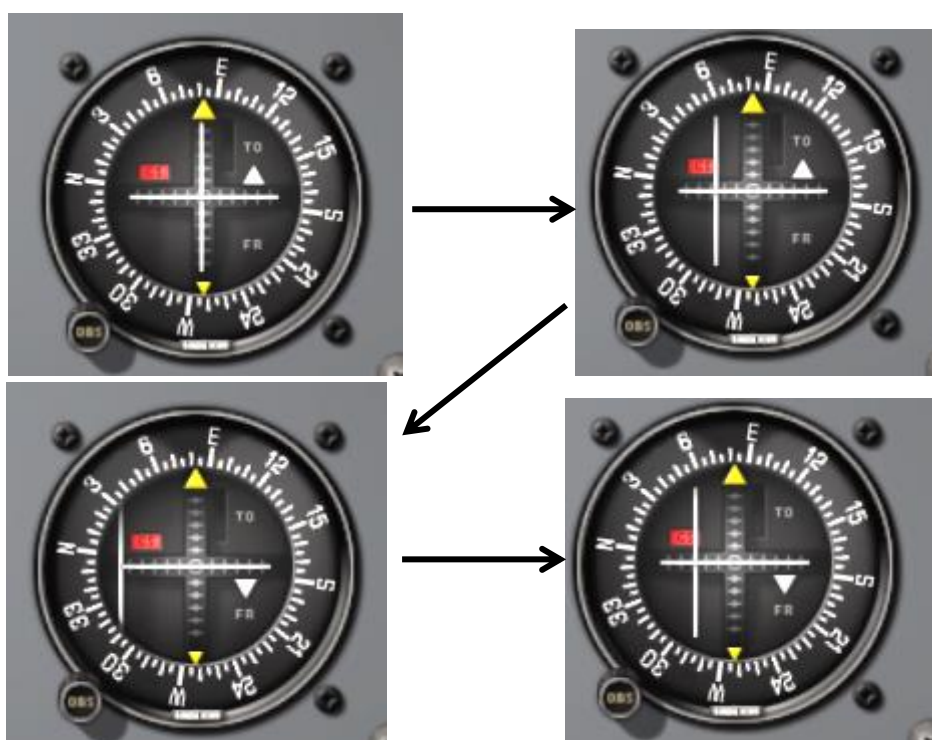
Here is the result after the wind effect and heading adjustment to catch the right course:



8. Overhead the VOR

When approaching the VOR, the needle will move to one direction quickly. If you don't want to change direction, then do not touch heading and navigation instrument.

Your aircraft is in the 'silent cone'. When an aircraft is overhead a VOR, the information given by the beacon is not correct. You must wait a little in order to retrieve proper VOR reception.



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After crossing the VOR, check that the white triangle moved to the **FROM** (FR) indicator

9. Going forward from the beacon

If you maintain the heading, you continue your route outbound the VOR station. To maintain outbound:

- 1) Maintain the needle of the VOR navigation instrument centred, and the indicator to FROM position
- 2) Use the same course heading

