

### Training mission 3 – Preparation:

For the 3rd lesson, we are going to make a tour around the neighborhood of KMXF.

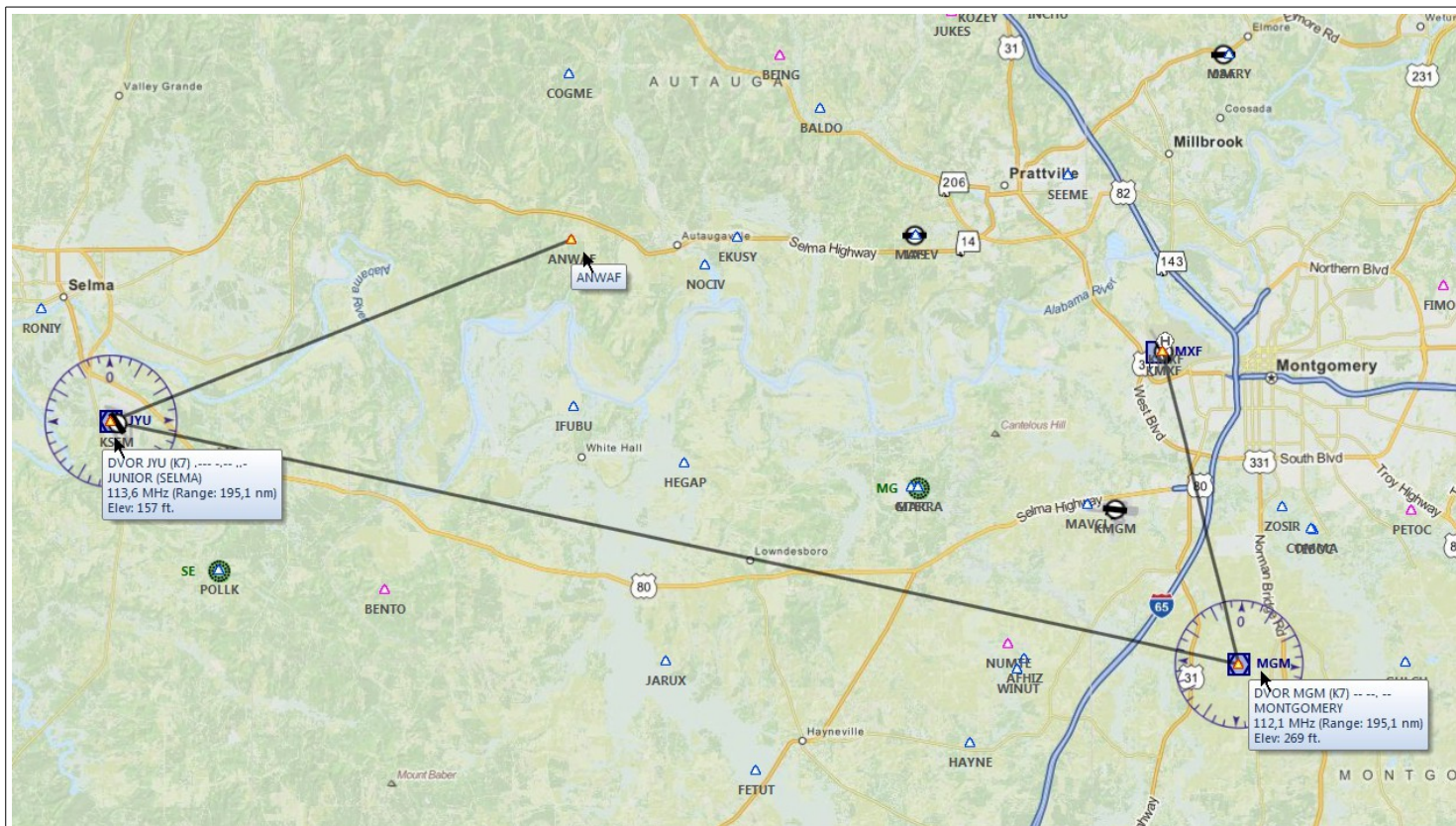


Fig.1 - IFR flightplan for trainings-mission 3

### Short mission overview:

- Take off from the helipad at KMXF into HOVER\_MODE.
- Set heading for the MGM Vor.
- Make transition from HOVER\_MODE to FLIGHT\_MODE.
- Perform a fast climb to cruise altitude (2000ft) (no IAS lock)!
- Lock IAS only when reaching cruise level.
- >>>
- Fly on NAV1 and HSI to the MGM Vor.
- Fly on HDG (alone) to JYU VOR.
- Fly to ANWAF waypoint with help of the GPS.
- Make transition from FLIGHT\_MODE to HOVER\_MODE.
- Perform a descent down to hover-height and speed.
- Land at ANWAF waypoint.
- Save your flight for the next lessons to come.



## Training mission 3 – The flight.



**Fig. 1 – In order to get to the MGM Vor, you first need to enter its frequency into the Nav1 radio.**  
 - Press [Shift][2] to display the BELL206B “radio equipment stack” on screen.



**Fig. 2a – (top right) Enter the MGM Vor frequency (112.10Mhz) Into NAV1 radio (red dots).**  
**Fig. 2b – (top mid) Press [STBY] to set 112.10 Mhz as the active frequency of the Nav1 radio. (green square).**  
**Fig. 2c – (top mid) Press the [Nav1] – on top of stack - to hear the MGM Vor Morse code signal (red dot).**  
 Every VOR broadcasts its own name in Morse code for pilots to check if they have tuned their radio correctly.  
**Fig. 2d – (left – mid) Note that the [NAV] on the HSI disappears!**  
 This happens only, when you have entered a correct VOR frequency AND the Vor is in range of the Nav1 radio!





**Fig. 3 – Use the HSI to find the direction to fly towards the MGM Vor.**

- Rotate the HSI's OBS knob until the yellow arrow becomes "whole" (1 straight line) again.
  - Read the number from the compass-rose at the yellow arrows tip. (~160 degrees).
- That is the heading (from here) where the MGM Vor is located.



**Fig 4. Which radio is connected to which instrument overview**

- (right-top) Nav1 radio controls the Horizontal Situation Indicator. (HSI - Yellow squares)
- (right-mid) Nav2 radio controls the Omni Bearing Selector. (OBS - Blue squares)
- (right-mid) Nav2 radio controls the Auto Direction Finder. (ADF - Green squares)
- (right-top) Each radio has its own "hear the Morse code button" in the top row of the radio stack.
- (right-mid) Nav1 and Nav2 radios also have a build in DME (Distance Measurement Equipment) function.

### Lesson 3 - the flight.

Now we know which heading to fly to reach the MGM Vor, lets get started shall we? I'll skip the “cold-and-dark” start-up phase and continue this lesson, sitting in the helicopters cockpit that is ready for take-off. (see trainings mission 1 document for that).



Press **[STAB]** to turn on the HAP-gauge.



Press **[F/TDN]** to engage HOVER\_MODE:  
>> HOV is indicating HOVER\_MODE.  
>> 136 is the current Heading.  
>> HHT = Hover HeighT.

*Note:*

*HHT is automatically set to 20 ft above ground level*



**Fig. 5 - Helicopter hovering at 20 ft, nose pointed to compass course / heading 136.**





**Fig.6 - Set [HDG] to 160 before take off.**

This can be adjusted/ fine-tuned later on in the flight, when we get closer to MGM Vor.



**Fig.7 - Press [F/TDN] to engage FLIGHT\_MODE and let the helicopter climb to cruise altitude.**

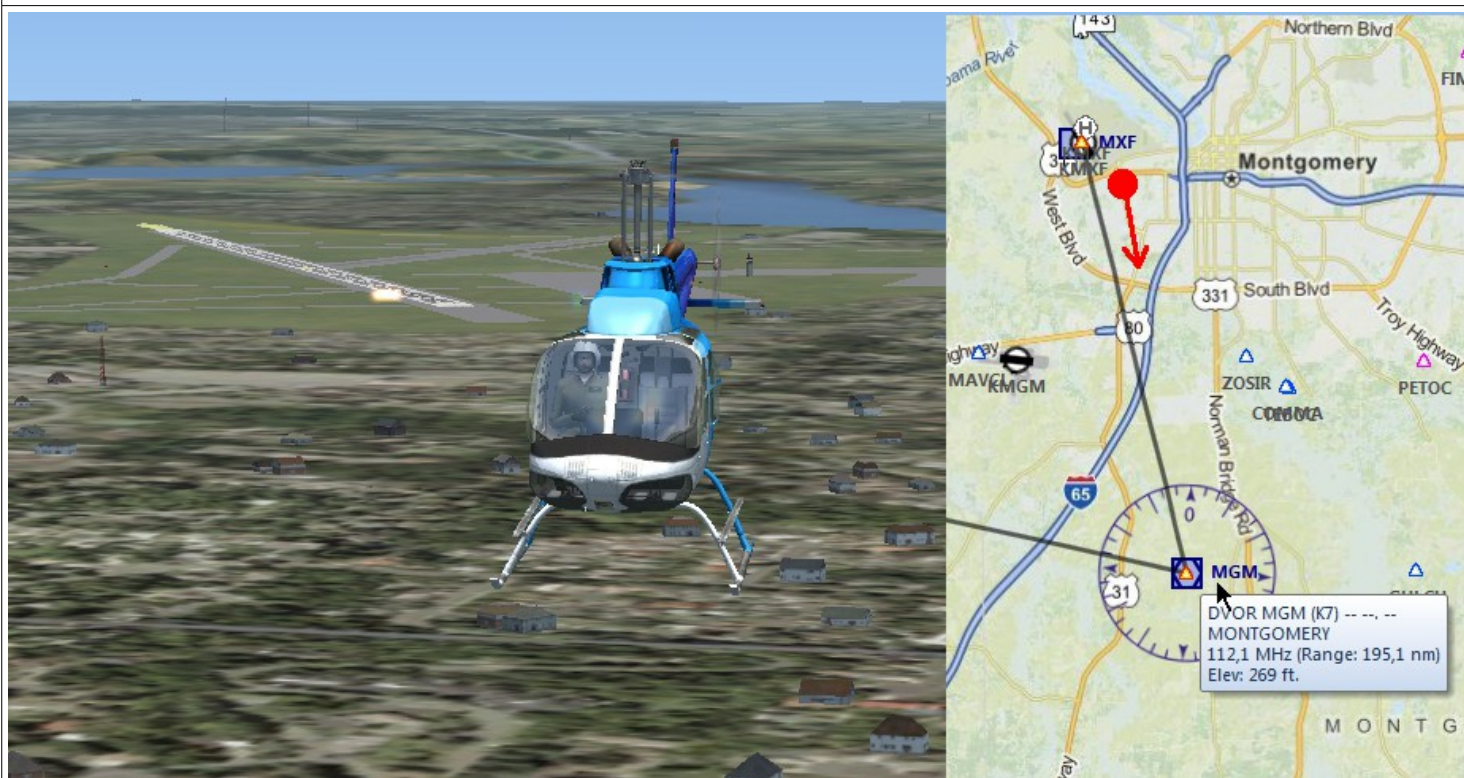


**Fig.8 – When the forward speed > 40 Kts, HAP sets V/S= +500 and IAS = 75 kts automatically!**

- Turn **[IAS]** off (green square) to climb with maximum forward speed.

- Set **[ALT.A]** to 1200 foot to climb to our current cruise altitude.

If you want you can even adjust the **[V/S]** to e.g. +800 or +1200 to climb even faster to cruise altitude.



**Fig.9 – Leaving KMXF, on our way towards the MGM Vor, flying on an initial heading of 160 degrees.**





**Fig. 10 – Press [NAV] to tell the HAP-gauge to fly directly to MGM-Vor.**

- Note the little Blue triangle light is burning, indicating that we are now flying with the [NAV] function on.
- HDG changes to VOR,
- Heading 160 changes into 165 *because we did not fly in an EXACT STRAIGHT LINE to the MGM Vor!*



**Fig. 11 – Press [SHIFT][3] to switch on the GPS and watch the MGM Vor location closing in.**

- When you are exactly flying overhead, you can see MGM Vor gliding underneath your helicopter.





**Fig. 12a – (right-top) Set the Nav1 Radio frequency to 113.60 Mhz.**

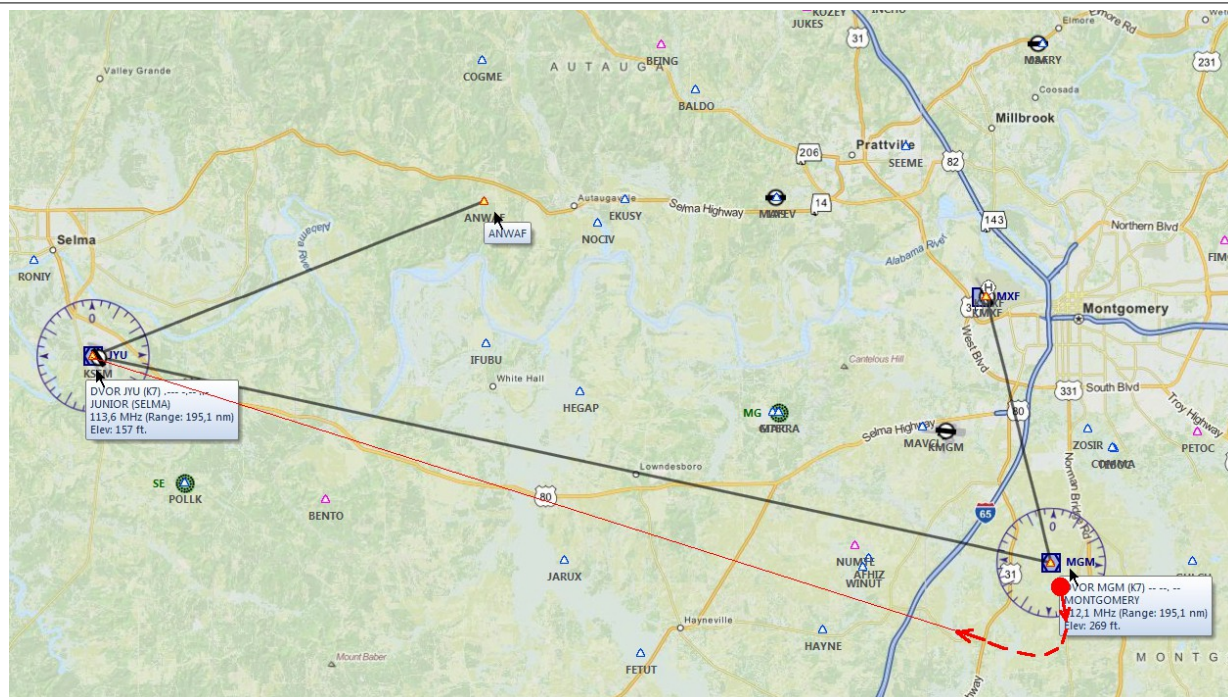
**Fig. 12b – (right-top) Press the NAV1 Morse code button and if check the Vor's Morse-code.**

**Fig. 12c – (left-middle) Turn the OBS knob on the HSI to make the yellow arrow “whole” again.**  
That is your new heading to fly to the JYU Vor.

**Fig. 12d – (right-bottom) Press [NAV] to deactivate it.**

**Fig. 12e – (right-bottom) Press [HDG] to activate it.**

**Fig. 12f – (right-bottom) Set [HDG] to the newly found heading towards the JYU Vor.**



**Fig. 13a – The helicopter turns right and flies towards the JYU Vor on the same altitude and speed.**



### FSX Helicopter Auto Pilot (HAP) Gauge – Training mission 3

From time to time you need to check if you are still flying straight to the VOR. (due to cross-winds). That is where the GPS's **[DCT]** (Direct Route) comes in handy. See the images below how to use this feature.



**Fig. 14a – (mid) Press [DCT] on the GPS, (green square).**

**Fig. 14b – (left) Enter “JYU” via your keyboard.**

**Fig. 14c – (mid) Press [ENT] 2 times to get an instant and direct heading to the JYU Vor.**

- The GPS now displays the NAV page again.
- The GPS now shows a purple line, direct to the JYU Vor.
- The GPS shows the heading to the JYU Vor (292).



**Fig. 15 – Set [HDG] to 292 to adjust the heading of the helicopter. (red dots).**

*TIP: Perform these steps on a regular basis to keep flying directly to any VOR.*

*If you experience a side/tail/head wind, your helicopter can “drift away” from its preset “direct-to-course”.*

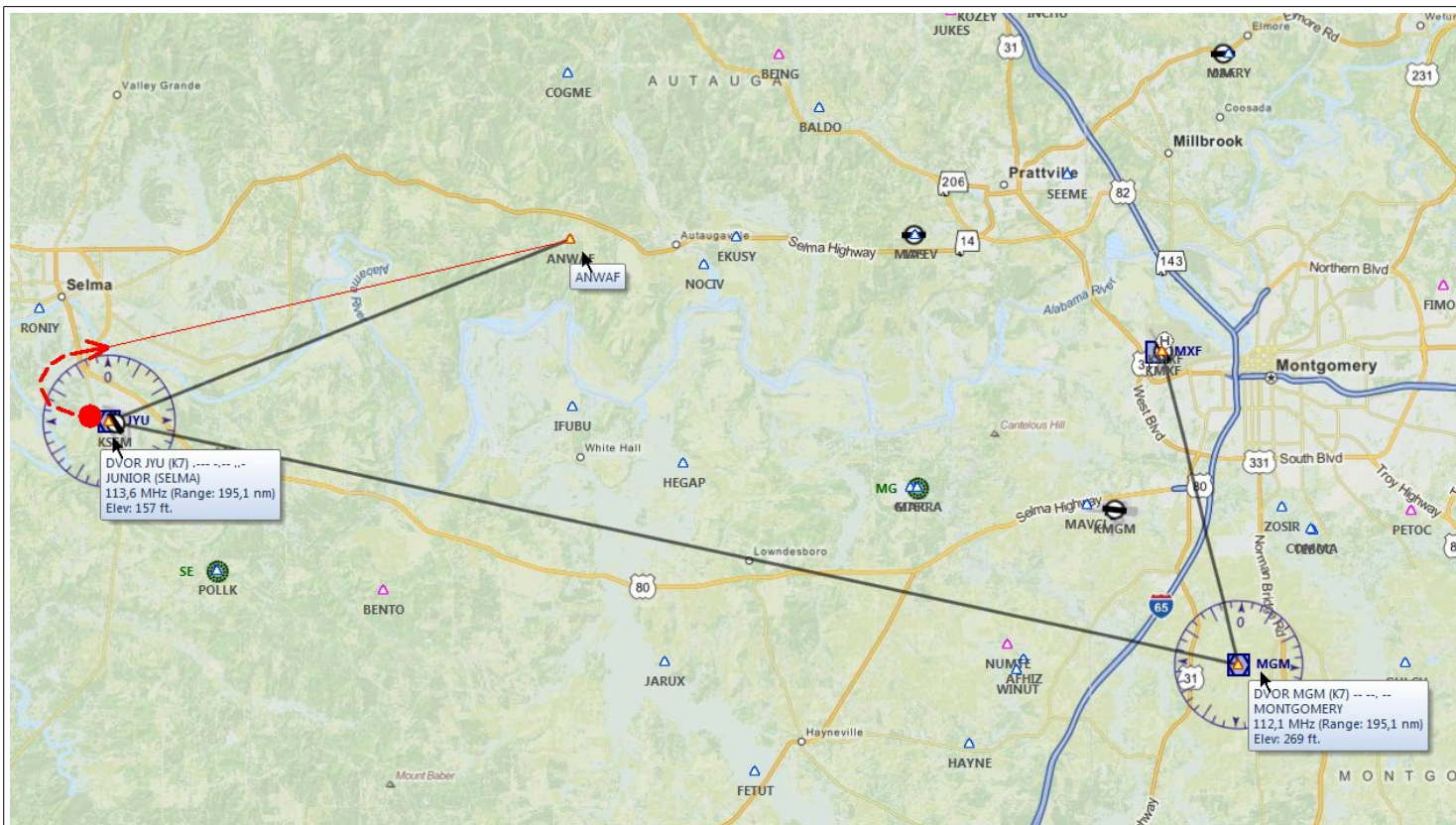


Fig. 16 – Congratulations! You have found the JYU on the ground at xxx Airport.

We have now flown the helicopter from KMXF to 2 different Vor's (MGM and JYU).  
We have used 2 different ways to get the job done, the [NAV] and [HDG] functionality of the HAP-gauge.

Let's continue our journey to find out how we can fly directly to any given (GPS) waypoint on the map.





**Fig. 17 – The 3rd part of this mission, fly to - and landing at the ANWAF waypoint.**



**Fig. 18a – (mid) Press [DCT] (green square) on the GPS.**

**Fig. 18b – (left) Enter “ANWAF” via your keyboard.**

**Fig. 18c – (mid) Press [ENT] (red square) 2 times to get a direct heading to the ANWAF waypoint.**

- The GPS now displays the NAV page again.
- The GPS shows a purple line, direct to the ANWAY waypoint.
- The GPS shows the heading to the ANWAY waypoint (076).





**Fig. 18 – Set [HDG] to 076 to fly direct to the ANWAF waypoint.**  
 - The helicopter now turns right on heading 076 towards ANWAF waypoint.



**Fig. 19 - Now use the GPS function to monitor:**  
 (upper right corner, yellow square) → distance to the waypoint → 7 Miles out.  
 (lower right corner, yellow square) → “the flight time” based on current air-speed → 10 Minutes to waypoint.





Fig. 20a – Set [ALT.A] to 500 ft and V/S to -100 to slowly descent before hovering.

Fig. 20B – Reduce [IAS] to down to 40 kts, to make the switch to HOVER\_MODE smoothly.



Fig. 21 – Press [F/TDN] to engage HOVER\_MODE, almost being above waypoint ANWAF.



**Fig. 22 – HOVER\_MODE Engaged - SET [HHT] = 0 to land the helicopter on the ground.**

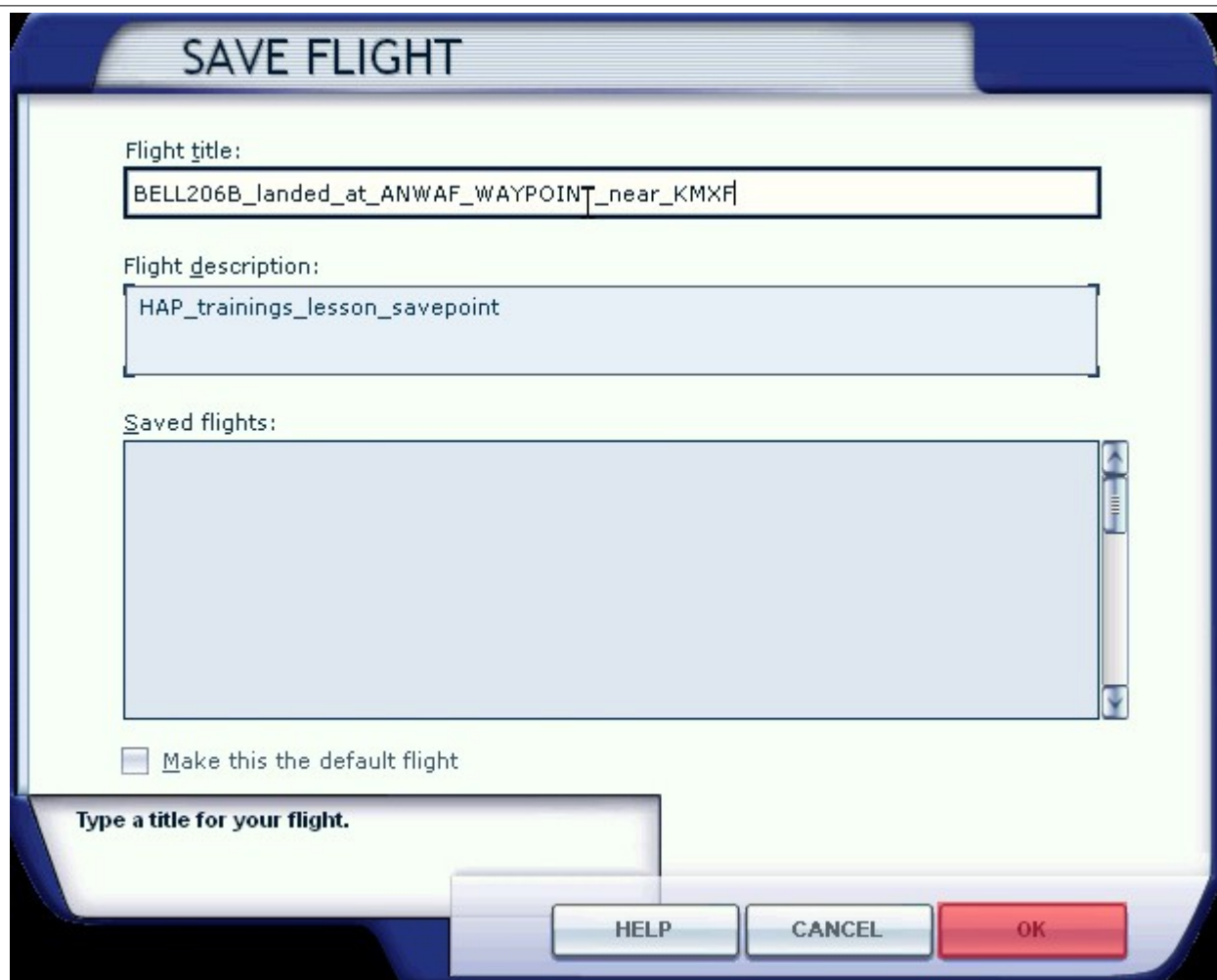


**Fig. 23 – Landed at waypoint ANWAF, Press [STAB] to switch off the HAP-gauge.**



## FSX Helicopter Auto Pilot (HAP) Gauge – Training mission 3

Shut down the helicopter as described in training mission 1.



**Fig. 24 – Save this situation for later training mission.**

Congratulations, you have just made you first HAP controlled - IFR helicopter flight.

**End of training mission 3**