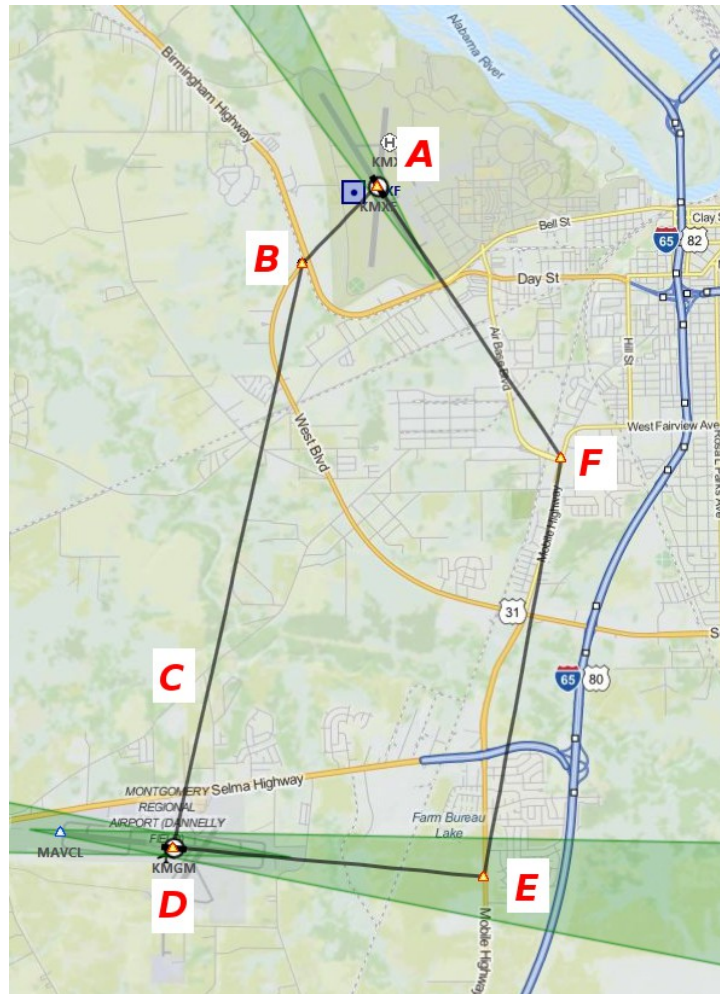


### Lesson 5 – Some more advanced HAP-gauge techniques.

#### Flight Preparation:

For the 5th and last lesson, we are starting on the helipad of KMXF.



**Fig.1 – Flight from KMXF to KMGM and back – the first part of this 5<sup>th</sup> HAP training mission.**

#### Short mission overview:

- 1 - Take off from KMXF's helipad with the HAP-gauge.
  - Fly towards KMGM airport.
  - Turn off the HAP-gauge.
  - Land manually
- 2 - Take off from KMGM airport manually.
  - Fly back towards KMXF's airport.
  - Turn on the HAP-gauge in full flight.
  - Land with the HAP-gauge back on KMXF.
- 3 - Take off from KMXF's helipad with the HAP-gauge.
  - Fly towards the Montgomery City for highway traffic patrol assistance.
  - Make transition from FLIGHT\_MODE in HOVER\_MODE over the traffic-interchange.
  - Hover down to 100ft above the highway.
  - Make transition from HOVER\_MODE back to FLIGHT\_MODE again.
  - Make transition from FLIGHT\_MODE in HOVER\_MODE over the buildings rooftop.
  - Land on the rooftop of Montgomeries biggest building.
  - Make transition from HOVER\_MODE back to FLIGHT\_MODE again.
  - Take off from the rooftop and and back to KMXF airport.
  - Make transition from FLIGHT\_MODE in HOVER\_MODE at the ATC tower.
  - Hover and buzz the ATC tower on KMXF airport.
  - Manually fly and land the helicopter back to the helipad.



Fig. 2a - Start up the helicopter from the “cold-and-dark” condition.

Fig. 2b - Press [STAB] to turn on the HAP-gauge.

Fig. 2c - Press [F/TDN] to engage HOVER\_MODE.

Fig. 2d - Set [HDG] to 230 to fly directly to point B.



Fig. 3 – Press [F/TDN] to take off from the KMXF's helipad towards point B.





**Fig. 4 – When reaching IAS > 75kts, set [ALT.A] to 1000 ft, the cruise altitude for this flight.**



**Fig. 5 – When reaching point B, set [HDG] to ~188.**  
- Aim at KMGM's runway lights for a good helicopter landing spot.



**Fig. 6a - When you have “the airport in sight” - switch off the HAP-gauge for a manual landing like this:**

**Fig. 6b - Press [ALT] to disengage Altitude lock.**

**Fig. 6c - Press [IAS] to disengage Airspeed lock.**

**Fig. 6d - Press [HDG] to disengage Heading lock.**

**Fig. 6e - Press [STAB] to completely turn off the HAP-gauge.**



**Fig.7 - Now find a nice spot to land your helicopter on KMGM apron.**

- Tilt the helicopter a little backwards to lose forward speed, by pulling the Yoke gently towards you.
- Slowly reduce lift-power to lose altitude by lowering the collective liver.
- Gently put the helicopter down on the KMGM apron.





Fig. 8a (right) - After landing on the KMGM apron, take off manually again.

Fig. 8b (mid) - Turn left towards point E (above the highway).

Fig. 8c (left) - Hold a heading of [090] while climbing to 1000ft.



Fig. 9 – When reaching cruise altitude, switch the HAP-Gauge back on again like this:

- Press [STAB] to completely turn on the HAP-gauge.
- Press [HDG] to engage Heading lock, adjust [HDG] to 90.
- Press [IAS] to engage Forward Airspeed lock,
- Increase [IAS] to 100 by pressing [CTRL][SHIFT][K] keys on your keyboard.
- Press [ALT] to engage Altitude lock, and leave it this way.

*And take a deep, deep breath, since the HAP has now everything under control again :-)*





**Fig. 10 – At point E, set [HDG] to 0 and follow the highway up North.**



**Fig. 11a – At point F, set [HDG] to ~333, to get back to KMXF apron.**

**Fig. 11b – When you have “the airport in sight” start planning your landing.**

From here it gets busy quickly, so take a deep breath again ;- ) and trust the HAP-gauge.





Fig. 12a - Reduce forward speed to 40 kts, by pressing the [CTRL][SHIFT][L] keys on your keyboard.  
 Fig. 12b - Press [ALT] to disengage the Altitude lock, to descent to 300ft.



Fig. 13a - Keep using [HDG] to aim at the desired hover spot (= begin of the taxiway to the helipad).  
 Fig. 13b - Set [V/S] to -100 to slowly! descend towards Hover\_Height.

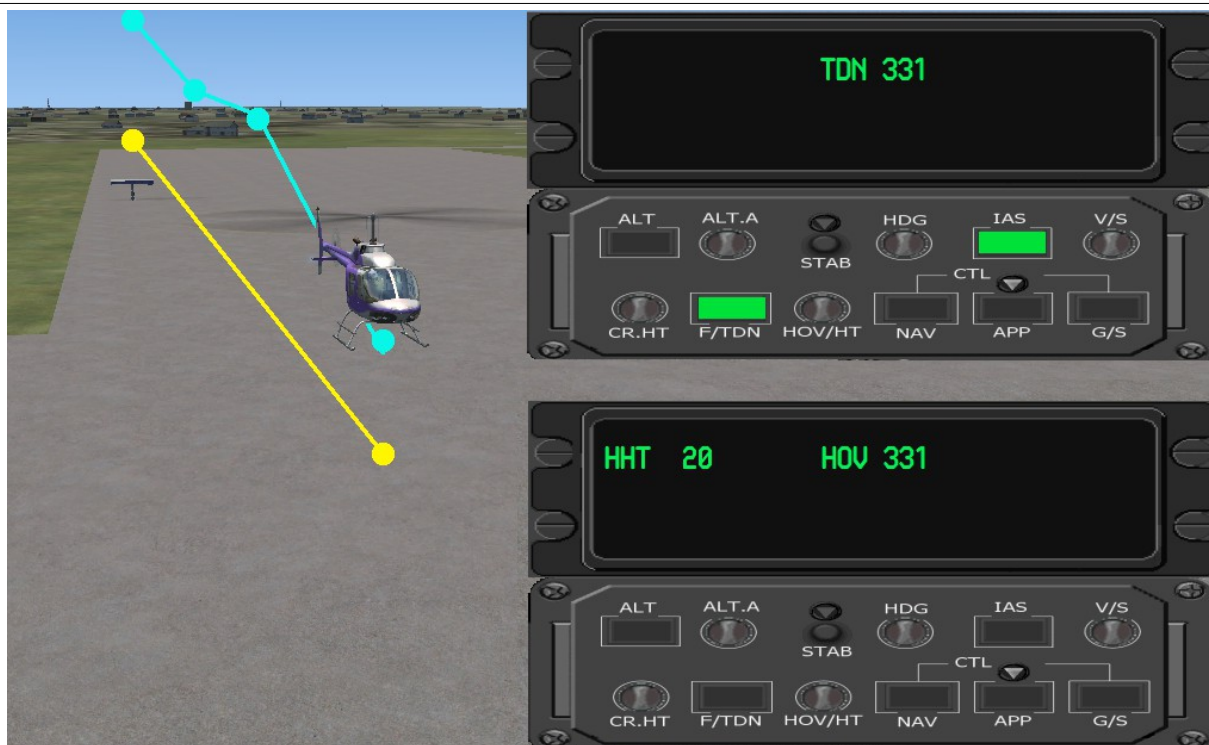


Fig. 14 – When reaching IAS < 40 kts and ALT < 300 ft press [F/TDN] to switch to HOVER\_MODE.



Fig. 15 – Hover back to the Helipad and land the helicopter.



## **FSX Helicopter Auto Pilot (HAP) Gauge – Trainings Mission 5**

You have learned how to dynamically engage and disengage the HAP-gauge in full flight.

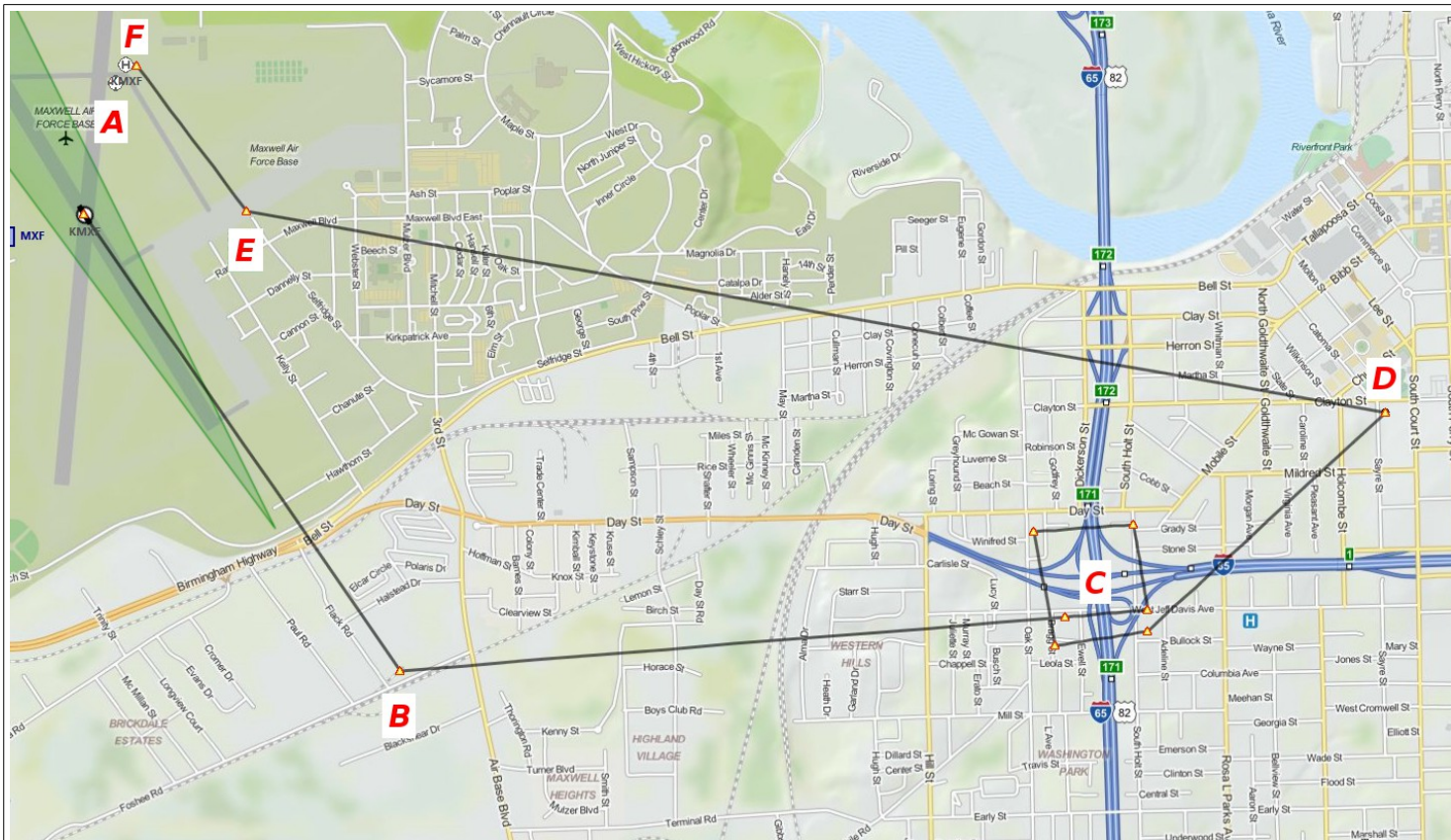
- ENGAGE the HAP can only be done when IAS > 40 kts and ALT > 200 ft. (FLIGHT\_MODE).
- DIS-ENGAGE the HAP can be done at any given time and flight (hover/climb, descent/levelheight) mode.

When using the HAP-gauge in this way, you can enjoy all aspects and fun of Helicopter flight your way:

- Use manual control for the challenging manoeuvring parts that you want to do yourself.
- Use the HAP-gauge for those long distance travel, cruise flights and ILS landing in thick fog and/or at night.

We now continue to the last part of our training mission: Highway Traffic Patrol for the Montgomery Police:  
Now we are going to use the HAP-gauge controls to “hover-on-the-spot” in mid-air.

- Hover around a little over Montgomery city.
- Land on top of Montgomeries biggest building.
- Hover at the ATC tower of KMXF airport.



**Fig. 16a – 2<sup>nd</sup> part of the mission is helping the Montgomery police with airborne highway-patrol duty.**



- Fig. 17a – Press [STAB] to turn the HAP-gauge on.**
- Fig. 17b – Press [F/TDN] to switch into HOVER\_MODE.**
- Fig. 17c – Set [HDG] to 153, heading for the local highway at point B.**
- Fig. 17d – Press [F/TDN] to take off and climb to cruise.**





**Fig. 18a - Enroute to Point B.**

**Fig. 18b - Press [ALT.A] and set it to 1000 ft.**

**Fig. 18c - Press [IAS] to lock forward speed to 75 kts.**



**Fig. 19 – At point B, Set [HDG] to 101 and turn North, to follow the highway.**





**Fig. 20a** – When you have point C in sight, reduce forward speed to 40 kts.

**Fig. 20b** – Reduce forward speed by pressing the [CTRL][SHIFT][K] keys on your keyboard.

**Fig. 20c** – At point C, perform a “counter-clockwise circling hover” to take a look at the traffic below:

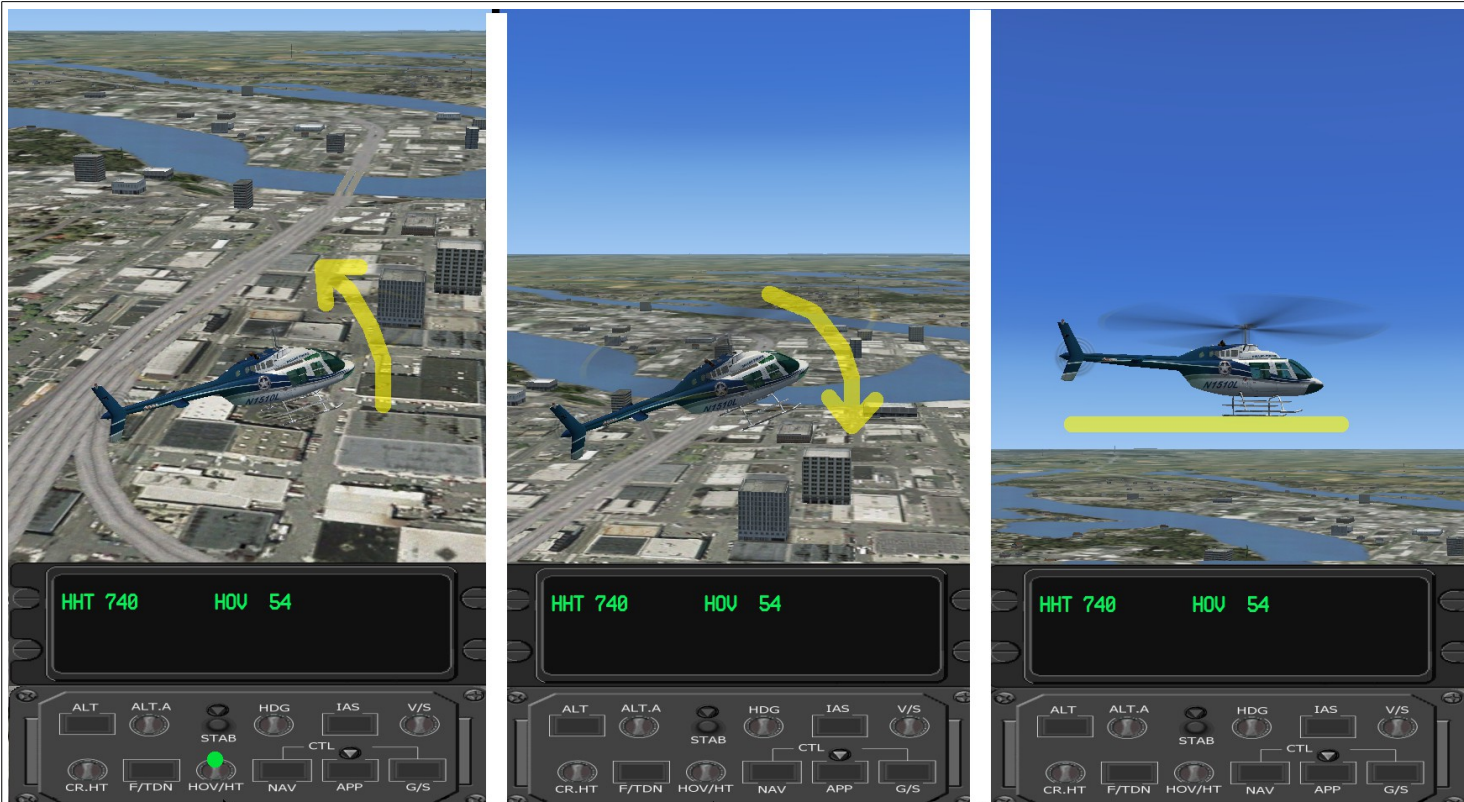
- Keep adjusting the [HDG] to a lower value to circle counter-clockwise
- Keep adjusting the [HDG] to a higher value to circle clockwise.



**Fig. 21a** – Keep adjusting [HDG] to fly a full circle around the traffic-interchange.

**Fig. 21b** – After completing a full circle... press [HOV/HT] HOVER\_MODE in mid-air.





**Fig. 22a – HOVER\_MODE activated:**

**Fig. 22b - It first pitches its nose up to lose forward speed and flies a little bit backward!**

**Fig. 22c - It then pitches its nose back down when forward speed is 0.**

**Fig. 22d - Then the helicopter “levels out” and hovers in mid-air.**



**Fig. 23a – Set [HOV/HT] to 100 to hover down to 100 ft, to take a closer look at the traffic below.**

*- Note that you only can use [HDG] now and nothing else!*



**Fig. 24a – Next hover challenge, (land-able) building rooftop in Montgomery city (yellow circle).**

**Fig. 24b – Set [HDG] to 51 to point the helicopters nose to it.**

**Fig. 24c – Press [F/TDN] to switch from HOVER\_MODE to FLIGHT\_MODE again.**



**Fig. 25a – When the helicopter accelerates, climbs and reaches IAS=75kts.. then quickly:**

**Fig. 25b – Press [V/S] to stop it from climbing further to its cruise altitude.**

**Fig. 25c – Press [HOV/HT] to engage HOVER\_MODE in mid-air again.**

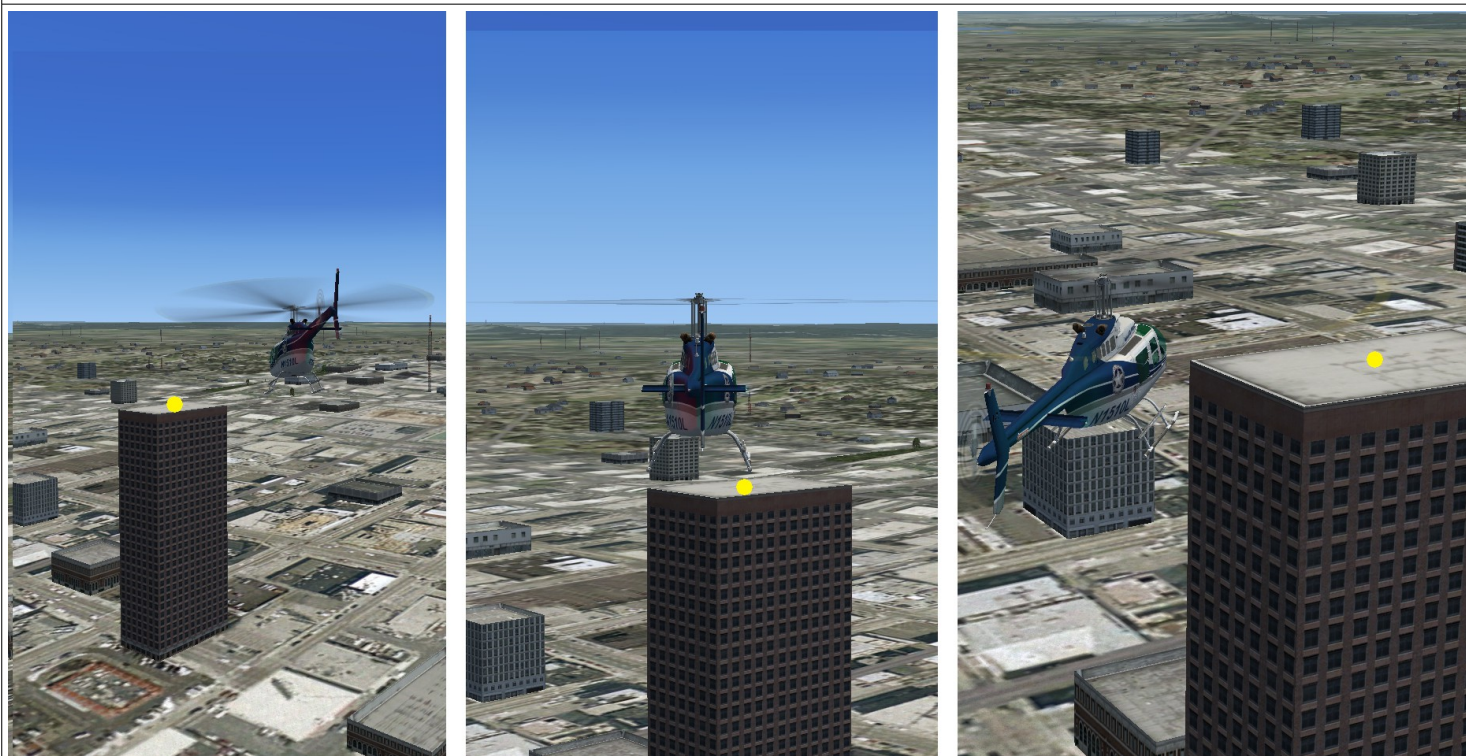
- The helicopter now slows down again and comes to a hover, just before the big building.





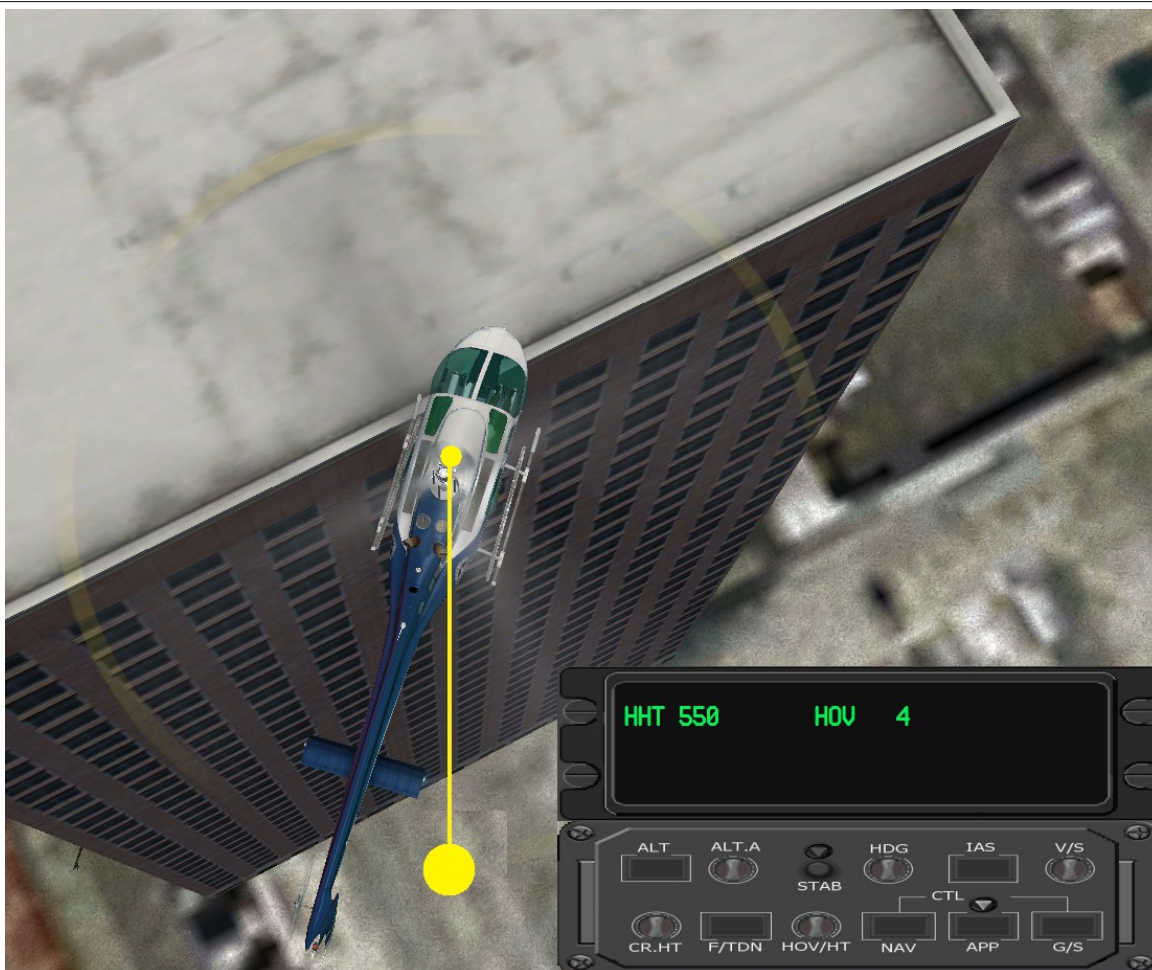
**Fig. 26a – Helicopter hovering – with the rooftop in sight.**

**Fig. 26b – Press the [CTRL][SHIFT][Up Arrow] key to hover forward over the roof.**

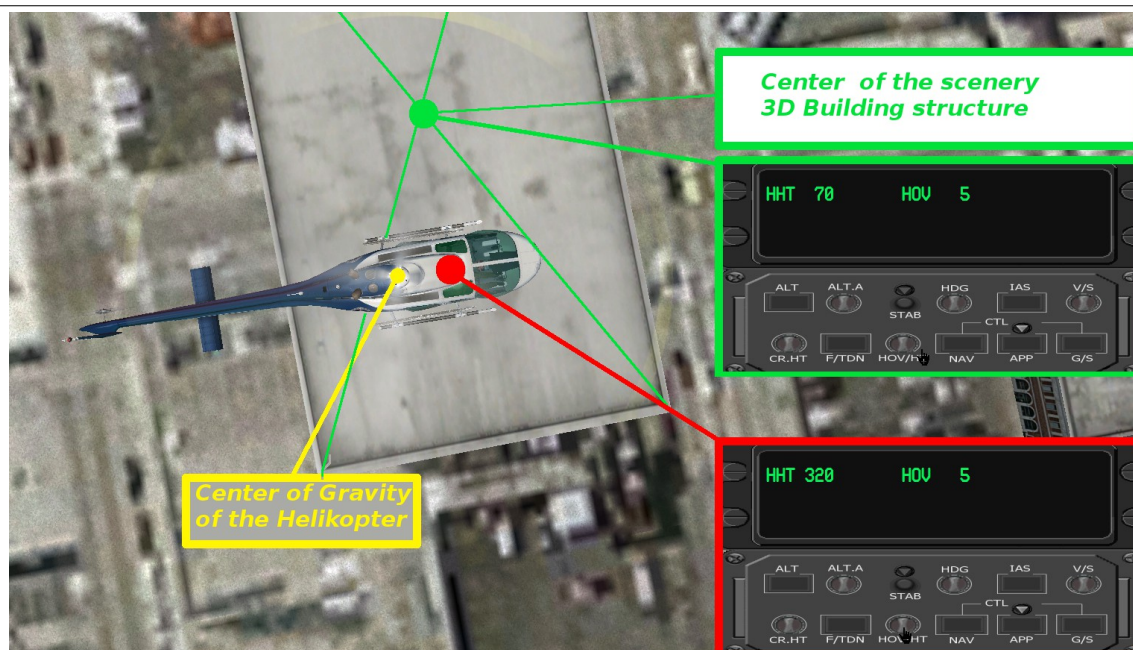


**Fig. 27 – Hovering to the center of the big building's rooftop.**





**Fig. 28 - Watch the HHT to check if the building under your helicopter is solid and thus land-able!**  
**Note: if you hover over a building and the HHT does NOT CHANGE, then you can not land on it!!!**



**Fig. 29a – Where you land on a 3D scenery structure really matters!**  
 - So always try to land as close to the center of a building / structure / helipad with your helicopter.

**Fig. 29b - Now hover sideways to the left, towards the center of the buildings rooftop.**





**Fig. 30 – Decrease HHT to 0 to land on the rooftop of the big building.**

Note: The helicopters landing-gear disappear a little bit into the roof's concrete.



**Fig. 31a - As you can see from the cockpit, no tricks, just a rock solid building-rooftop to land on.**

**Fig. 31b - Press [F/TDN] to take off into HOVER\_MODE.**

**Fig. 31c - Set [HDG] to 280 to get back to KMXF for the next hover exercise.**





**Fig. 32 - Press [F/TDN] again to switch to FLIGHT\_MODE, heading for the KMCF ATC tower.**



**Fig. 33a - Use [HDC] to fly straight to the KMXF ATC tower.**

**Fig. 33b - When approaching the edge of KMXF airport, reduce forward speed to 40 kts, Do this by pressing the [CTRL][SHIFT][L] keys on your keyboard.**

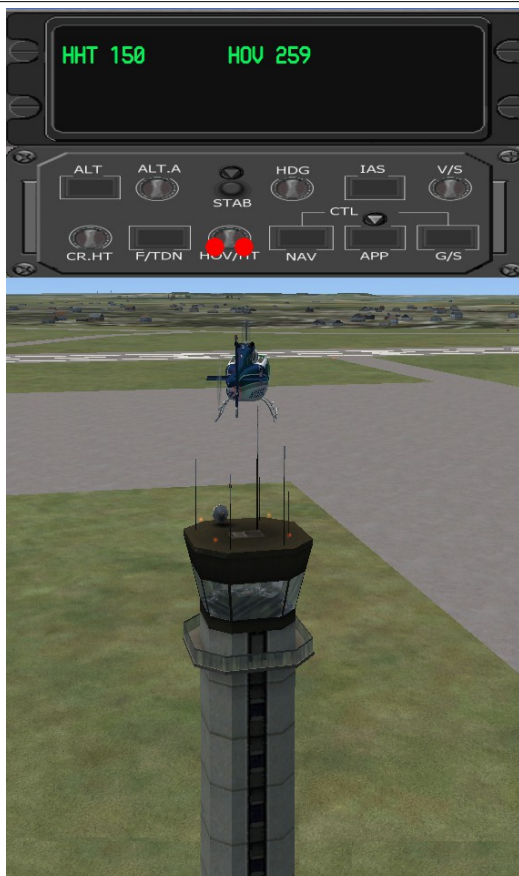




**Fig. 34a - Press [HOV/HT] switch to HOVER\_MODE in mid-air again.**



**Fig. 35 – Use the [CTRL][SHIFT][UpArrow] key to hover forward closer to the ATC tower.**  
 TIP: Use an external view + ground-shadow of your helicopter to see how close you are to the ATC tower.



**Fig. 36 – Set [HHT] to 90 to be able to peek into the ATC tower on their work-floor.**  
And thank those fine individuals for the excellent overwatch during your HAP training missions here.



**Fig. 37a - Turn off the HAP-gauge like this**

**Fig. 37b - [HDG] Off**

**Fig. 37c - [HOV/HT] Off**

**Fig. 37d - [STAB] Off**

**Note the yellow triangle shaped light burning, indicating that the HAP-gauge is switched complete off.**





**Fig. 38a – Manually fly and hover the helicopter back to the Helipad and land her.**

**Fig. 38b – Shut down the BELL206B helicopter.... and head for the Officers Club on KMXF.**

**Congratulations..**

**You now master the HAP-gauge completely!**

### Final Word



**End of the training mission5**

**The End of this HAP gauge tutorial series.**

I wish all readers many happy, nice and safe helicopter flights, where ever these might lead you :-)  
C.U. soon in Virtual Skies!

Best Regards,

Ronald Vermeij