Heinkel He-111 H6

By Chuck

TABLE OF CONTENTS

	(Unit)	LaGG-3	Yak-1	La-5	Il-2	Pe-2	Bf.109F4	Bf.109G2	Fw190A3	Ju-87	He-111
TEMPERATURES											
Water Rad Min Max	Deg C	80 100	80 100	- 	80 110	40 100	40 100	40 100	-	60 100-110	40 95
Oil Rad (OUTBOUND) Min Max	Deg C	40 100	40 100	55 75	70 115	-	40 80	40 80	40 110	30 105	35 95
Oil Rad (INBOUND) Min Max	Deg C	-	-	-	40 80	-	-	-	-	-	-
Cylinder Head Temp Min Max	Deg C	-	-	120 200	-	-	-	-	-	-	-
ENGINE SETTINGS											
Takeoff RPM	RPM	2700	2700	2400	2200	2700	2600	2500	2500	2500	2400
Takeoff Manifold Pressure	RU: mm Hg GER: ATA	1050	1050	1150	1150	1050	1.3	1.3	1.3	1.3	1.35
Climb RPM	RPM	2600	2650	2300	2050	2600	2600 30 min	2500	2400	2450 30 min	2300 30 min
Climb Manifold Pressure	RU: mm Hg GER: ATA	1020	1050	1150	1050	1050	1.3 30 min	1.3	1.3	1.25 30 min	1.15 30 min
Normal Operation/Cruise RPM	RPM	1700	1850	2300	1850	2200	2200	1900	2200	2100	2200
Normal Operation/Cruise Manifold Pressure	RU: mm Hg GER: ATA	1020	850	900	850	1020	1.0	1.0	1.1	1.2	1.10
Combat RPM	RPM	2650	2650	2400	2050	2600	2600	2500	2400	2250	2300
Combat Manifold Pressure	RU: mm Hg GER: ATA	1050	1050	1150	1050	1050	1.3	1.3	1.32	1.2	1.15
Emergency Power/ Boost RPM @ km	RPM	2700	2700	2400 10 min max	2200	2700	2700 1 min max	2500	2600 7-8 min max	2600 1 min max	2400 1 min max
Emergency Power / Boost Manifold Pressure @ 1 km	RU: mm Hg GER: ATA	1050	1050	1150 10 min max	1150	1050	1.42 1 min max	1.3	1.42 7-8 min Max	1.4 1 min max	1.35 1 min max
Supercharger Stage 1 Operation Altitude	m	0 2000	0 2500	0 2000	-	0 2000	-	-	-	Auto/man modes	Auto/man modes
Supercharger Stage 2 Operation Altitude	m	2000+	2500+	2000+	-	2000+	-	-	-	Auto/man modes	Auto/man modes
*Landing Approach RPM	RPM	2600	2200	2400	1800	2700	1500	1500	-	2000	2300
*Landing Approach Manifold Pressure	RU: mm Hg GER: ATA	As required	600	As required	600	As required	0.6	0.6	-	0.6	As required
Notes				Open Oil Radiator at all times	Close Oil radiator in combat	Flaps 30 on Takeoff & 15 on Landing			Lock tailwheel on takeoff	No Abrupt Throttling	Eng. very sensitive to ata/rpm
AIRSPEEDS											
Takeoff – Rotation	km/h	190	200	180	190	250	180	180	200	170	150
Optimal Climb Speed	km/h	270	260	250	250	240	280	280	270	230	N/A
Landing – Approach	km/h	200	180	200	200	200	180	180	190	190	200
Landing – Touchdown	km/h	170	150	170	150	160	160	160	150	150	140-150

PART I: THE AIRCRAFT

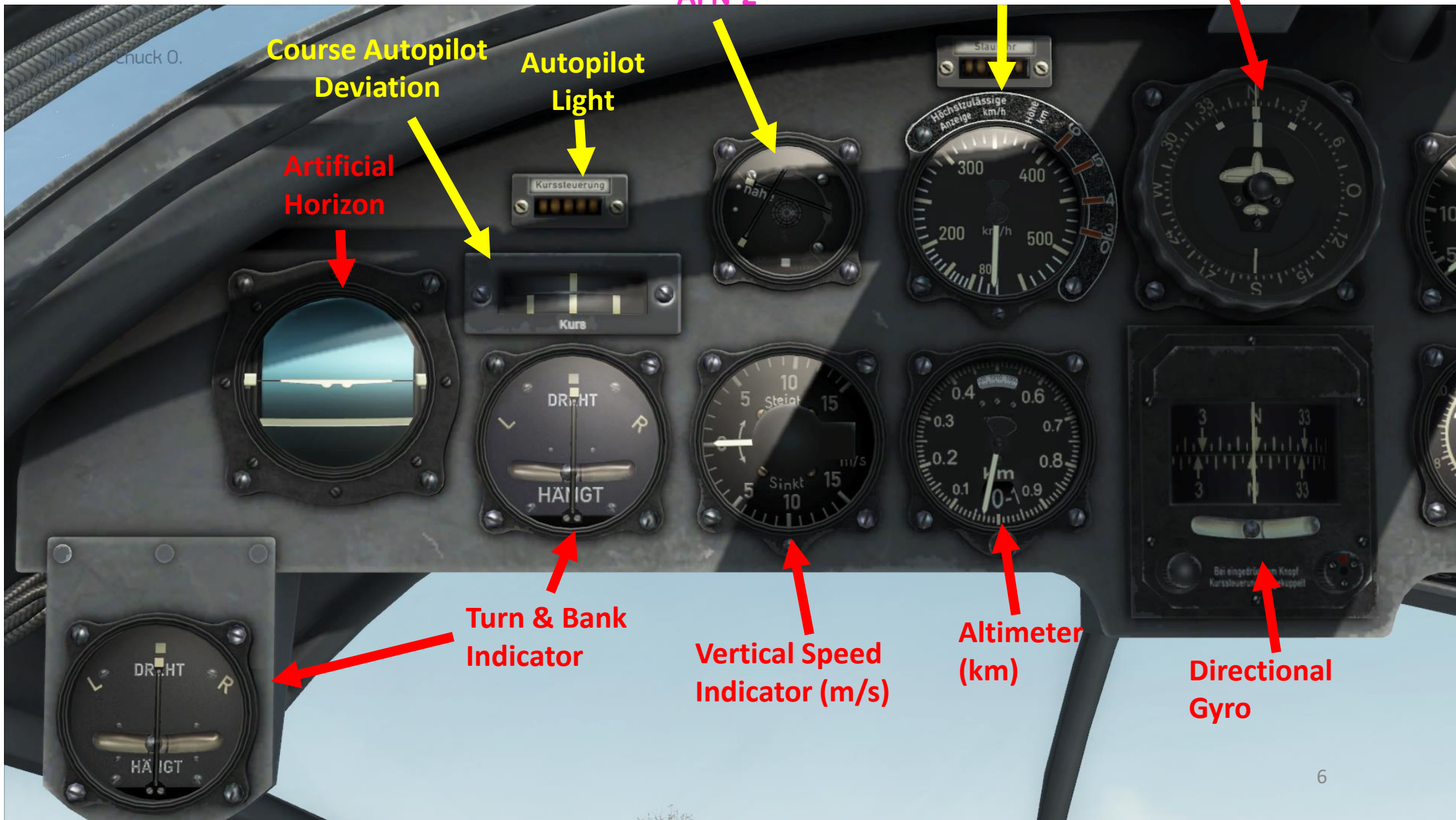
Exterior

Exterior

Oil radiators are opened incrementally, so you need to push the oil rad lever more than once to open it all the way.

PART I: THE AIRCRAFT

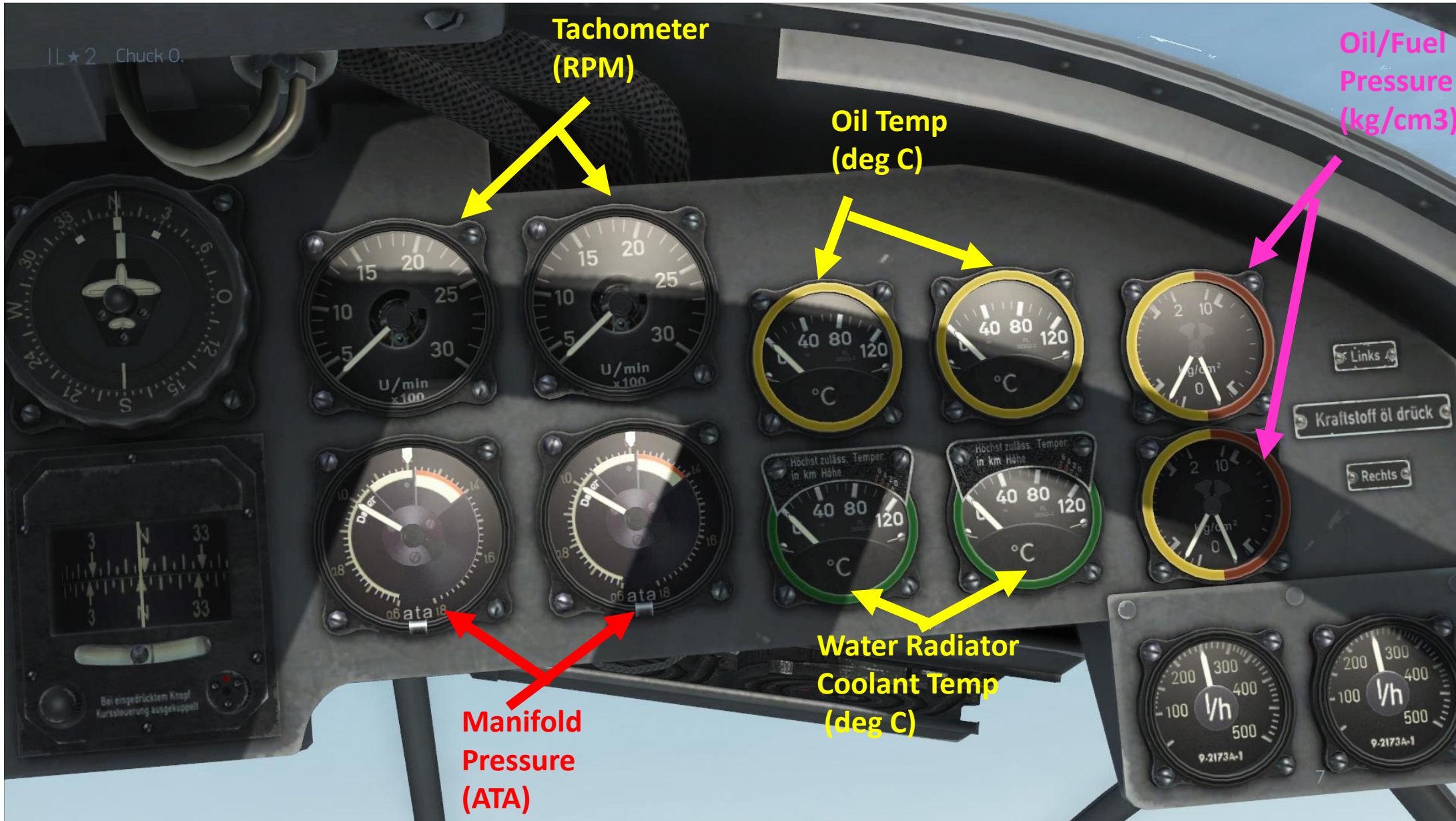
Cockpit



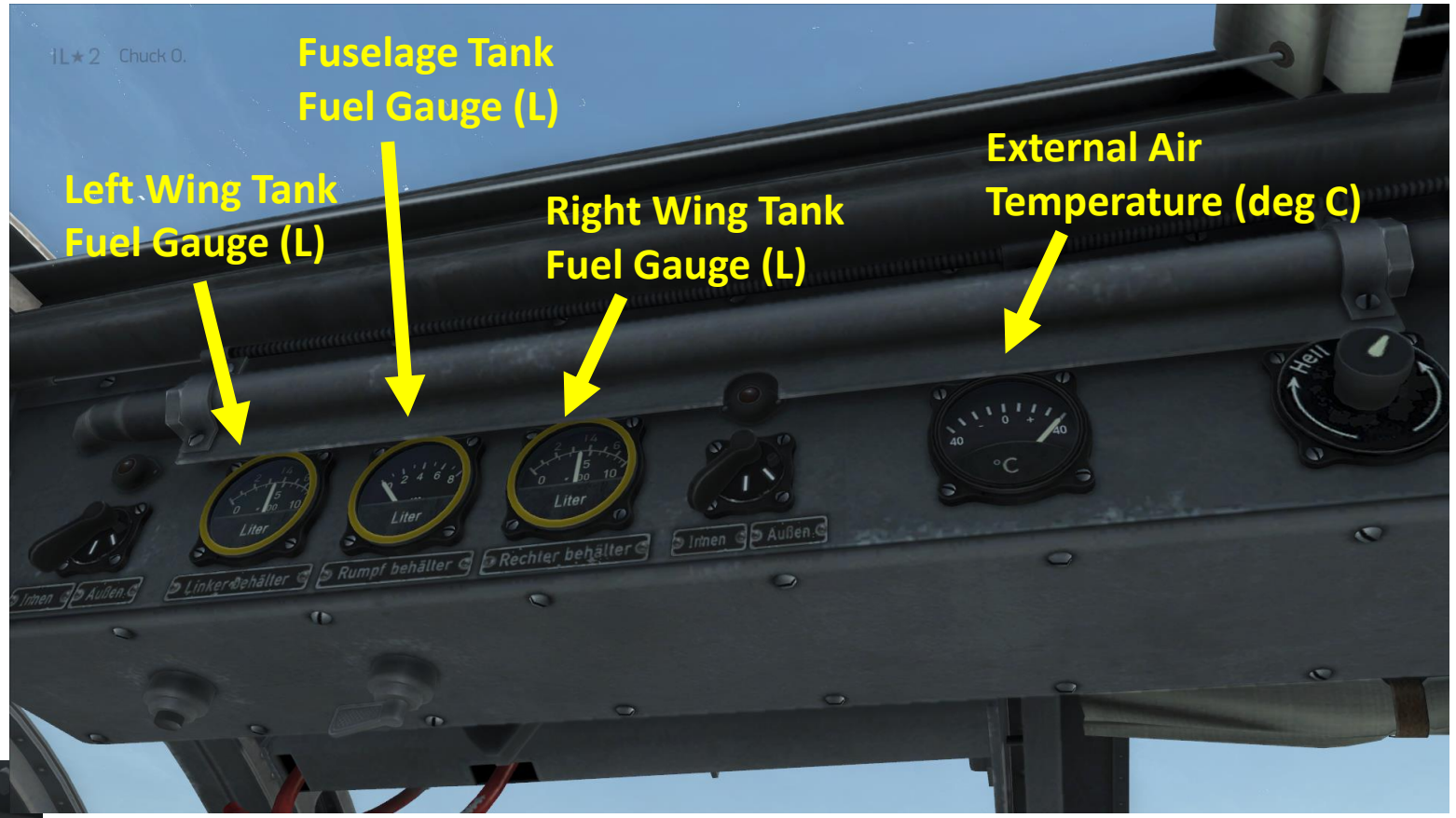
PART I: THE AIRCRAFT

Cockpit

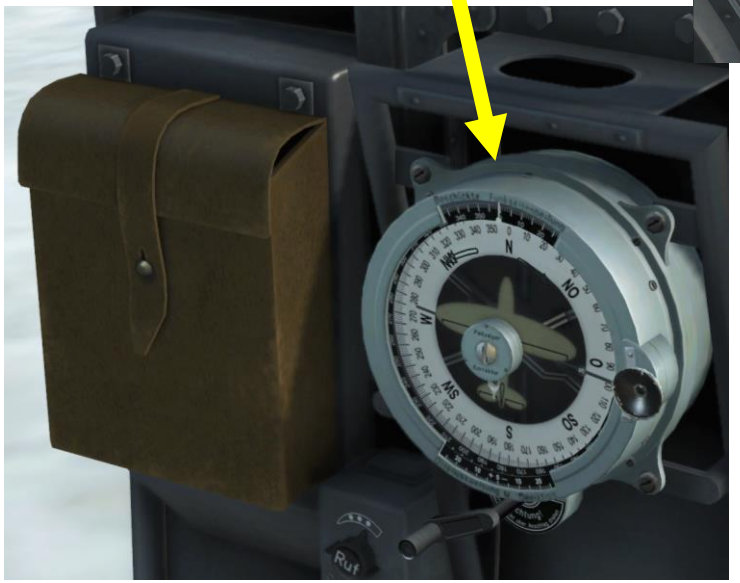
*no need to monitor



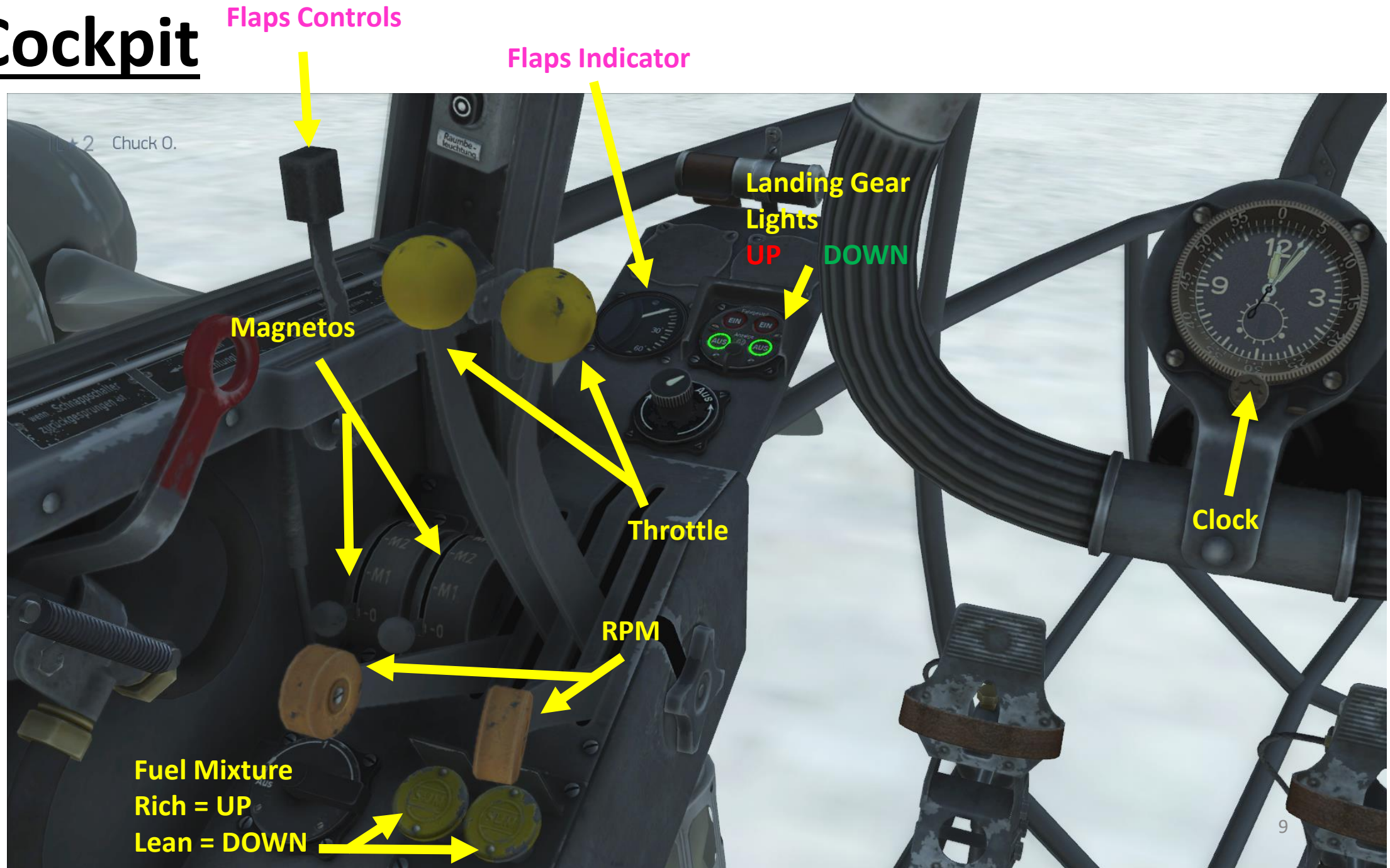
Cockpit



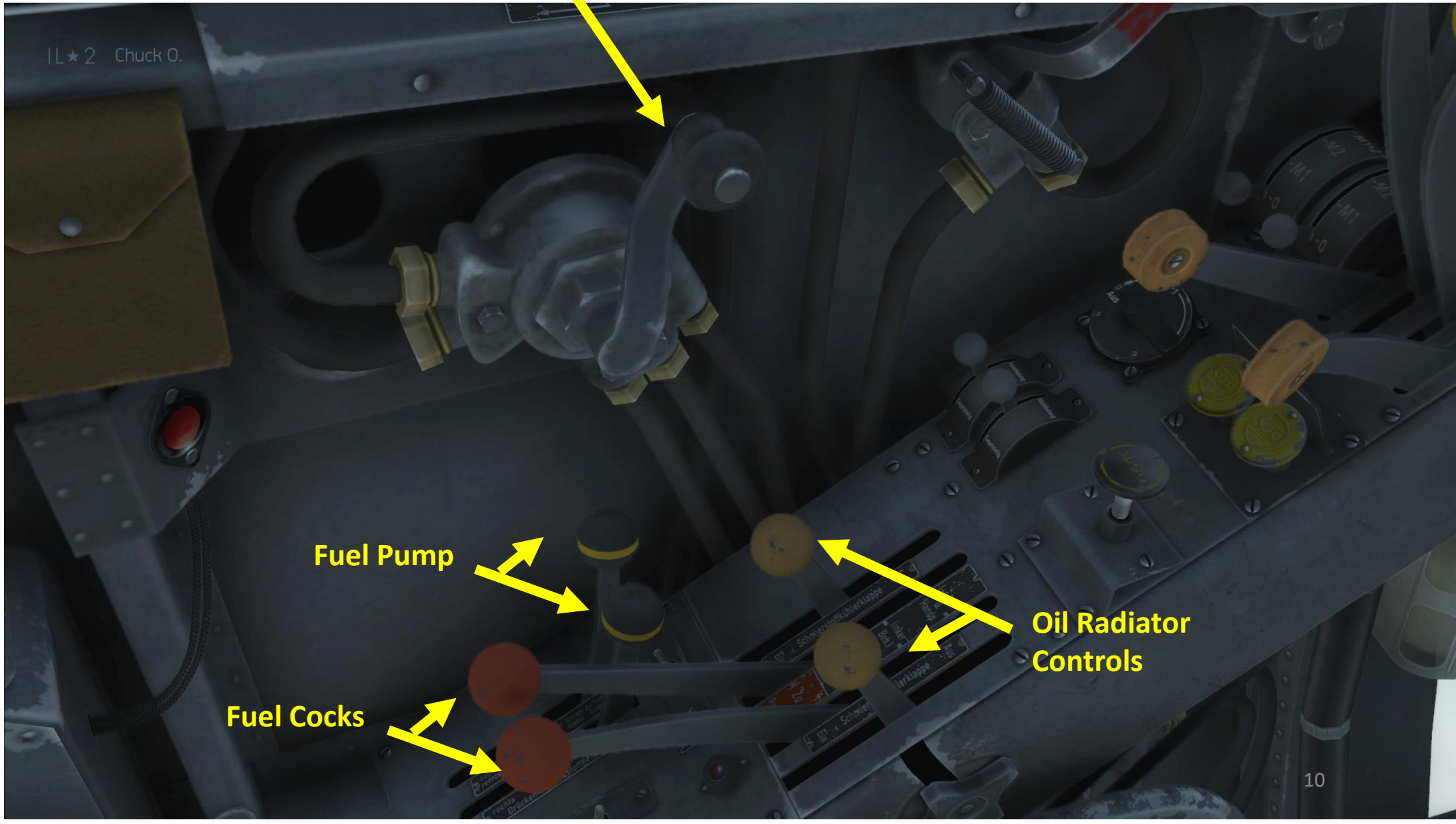
Radio bearing indicator



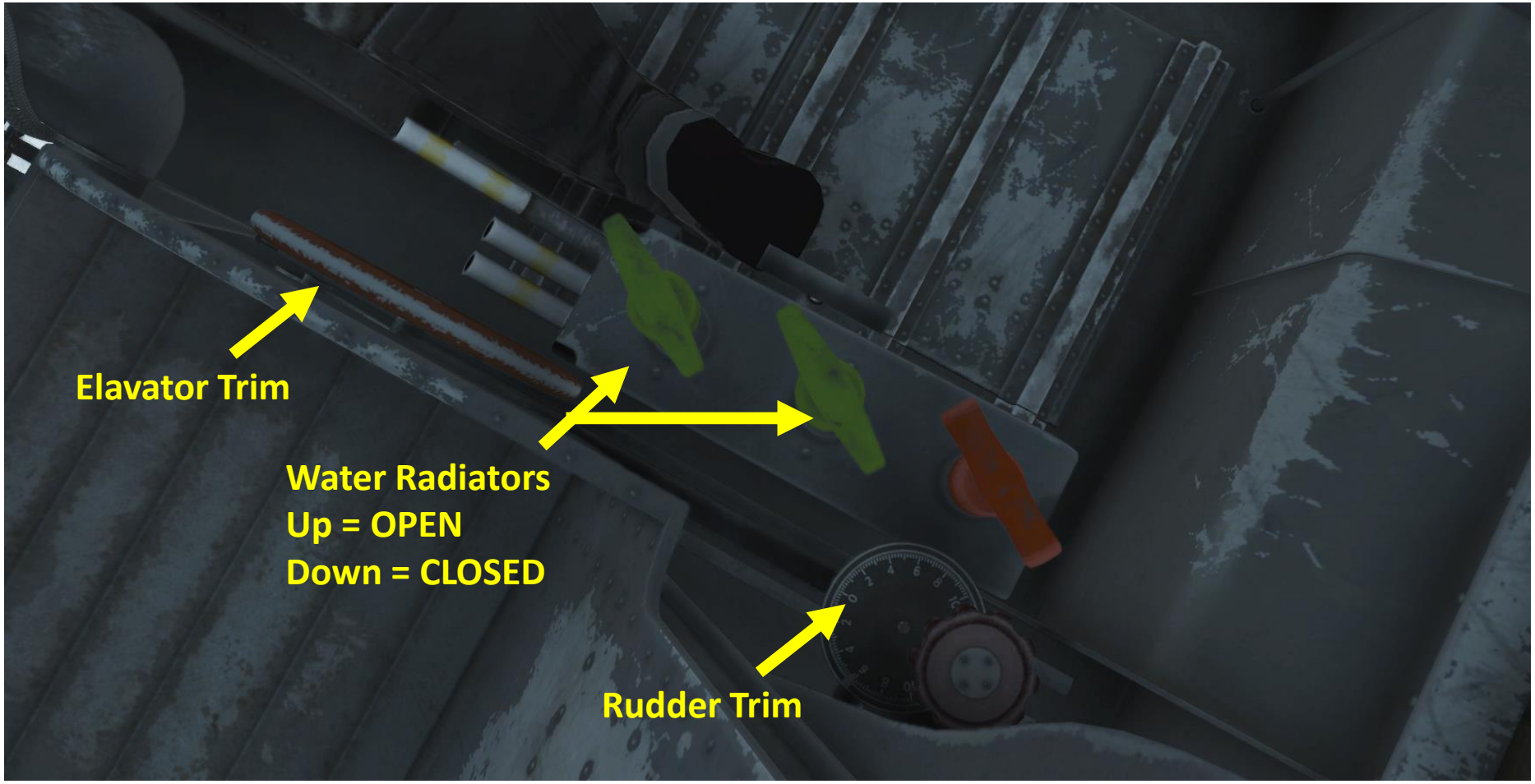
Cockpit


Flaps Controls
Flaps Indicator
Landing Gear Lights
UP
DOWN
Magnetos
Throttle
Clock
RPM
Fuel Mixture
Rich = UP
Lean = DOWN

Cockpit

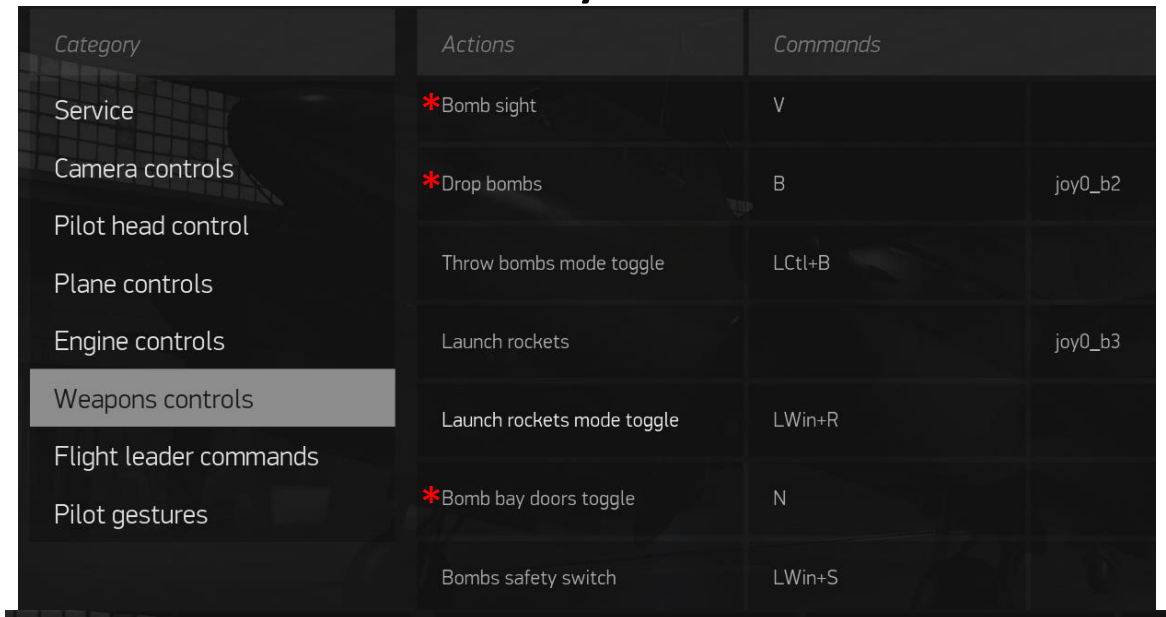

Landing Gear Lever
Fuel Pump
Oil Radiator Controls
Fuel Cocks

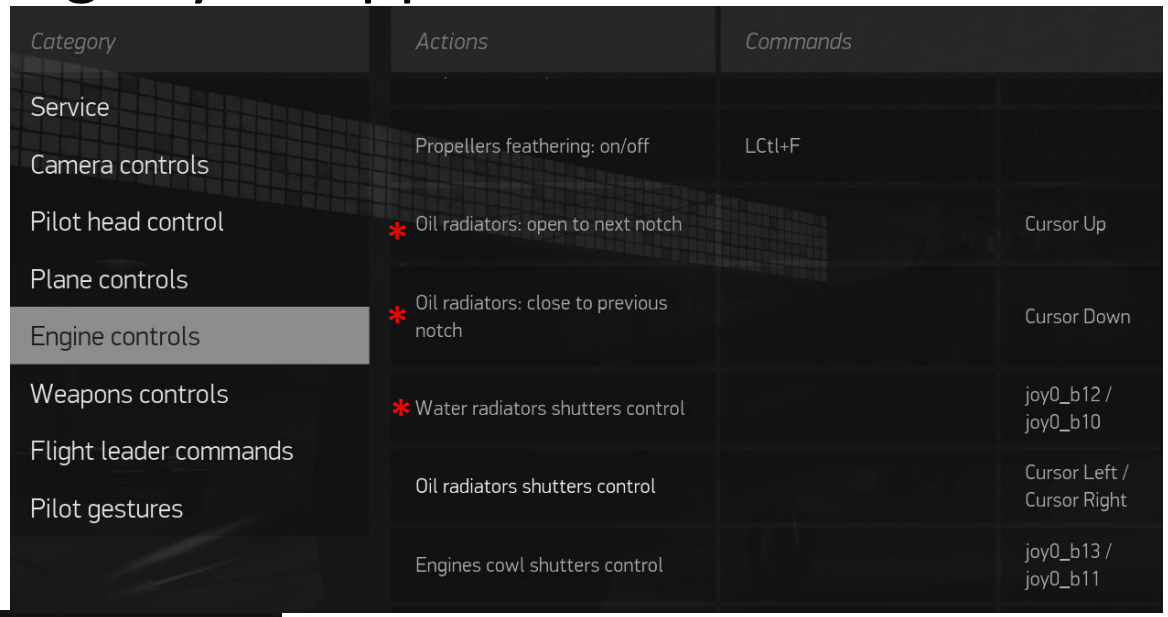
Cockpit

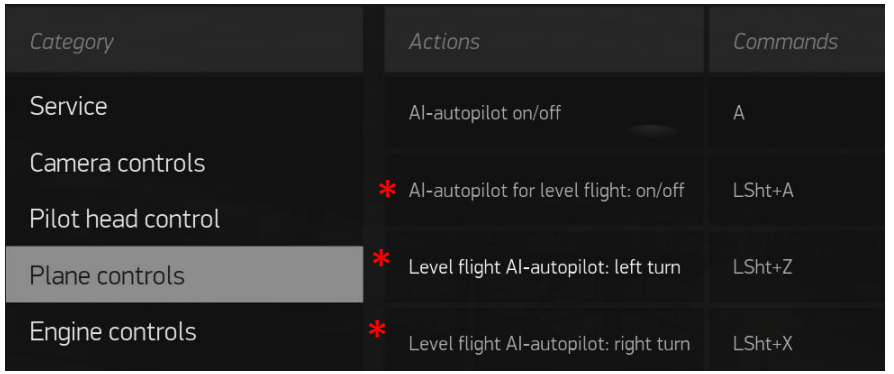

Elavator Trim
Water Radiators
Up = OPEN
Down = CLOSED
Rudder Trim

Important key bindings

- Make sure that you have the following keys mapped somewhere. *





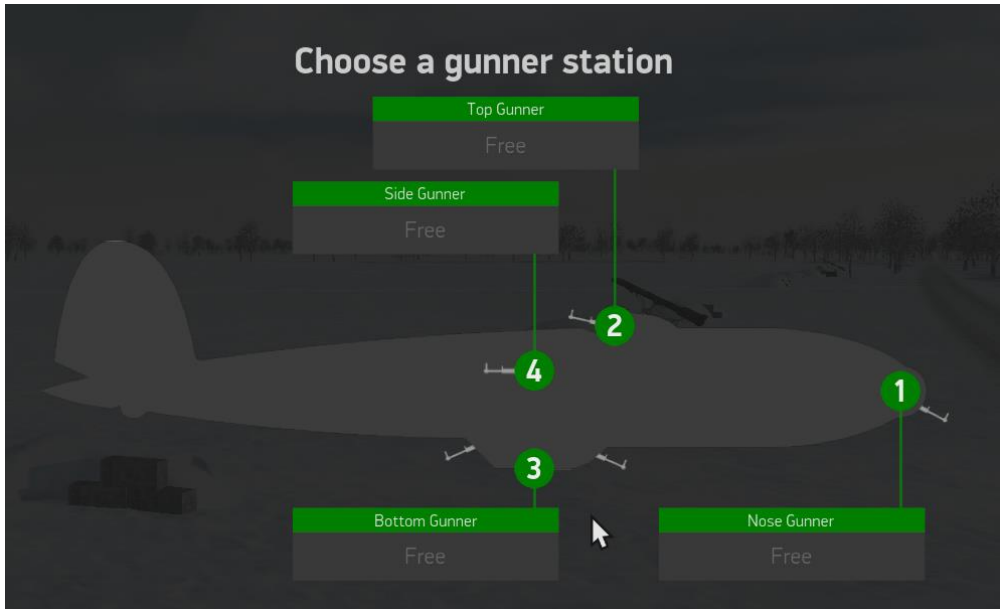


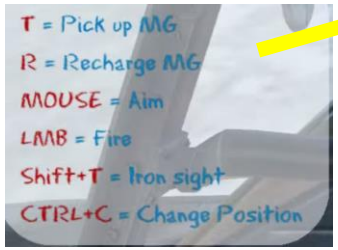
Note: Don't forget that the He-111 has toe brakes.

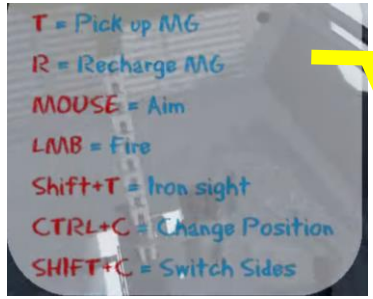
PART I: THE AIRCRAFT

Turret Operation

- For the turret gunners, make sure that you give them the command to fire at will (Ralt + 1)
- Also, give them the command to fire at long range (Ralt + 9)
- Flying in close formation with other bombers maximizes your firepower.

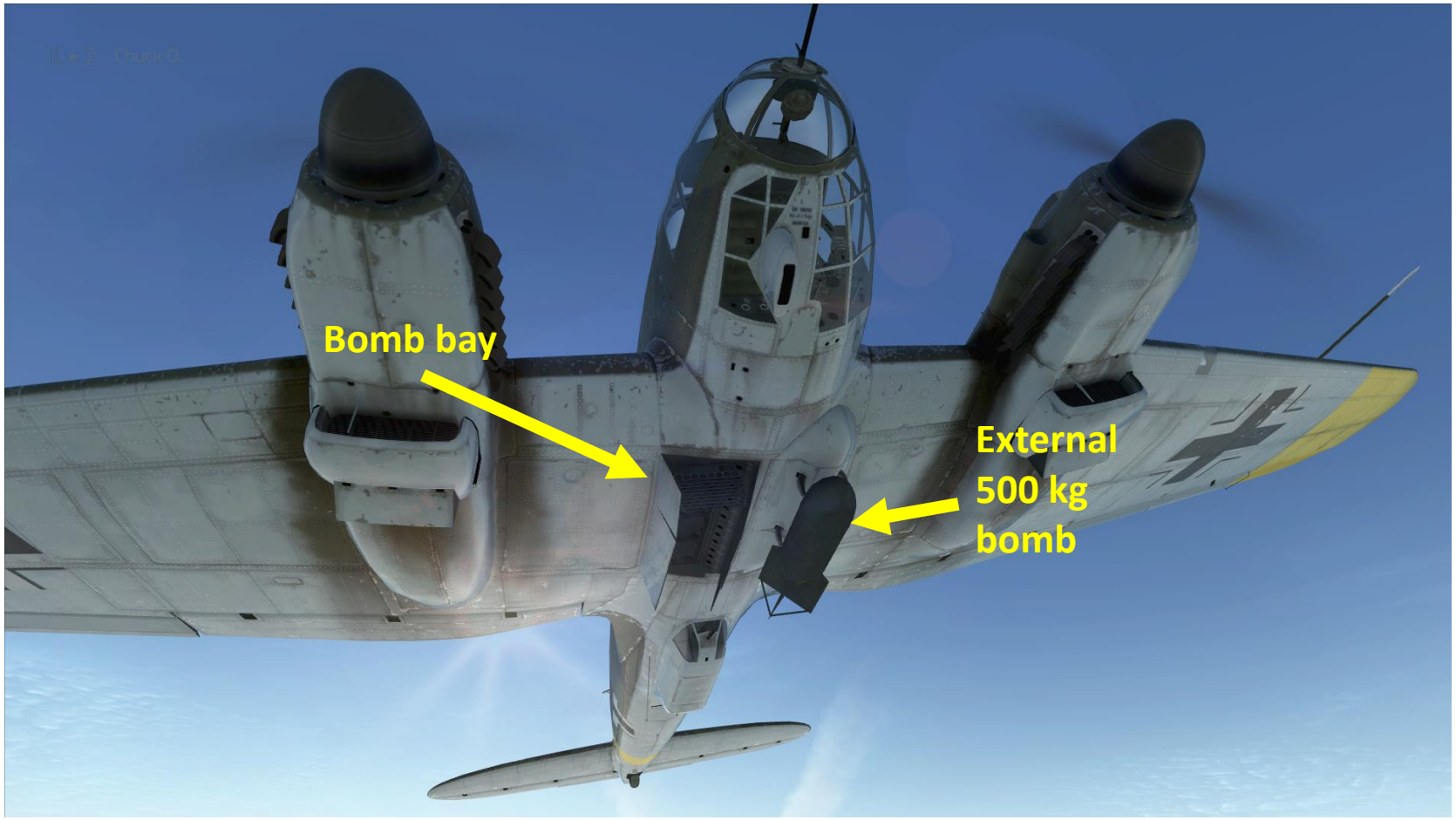






Bomb Bay Door Operation

- You can have an additional 500 kg bomb attached to a pylon right next to your bomb bay doors.



Complex Engine Management

- Powered by Jumo 211 engines.
- Documentation is very sparse on He-111 H-6 operation. Operational values are deducted from He-111 H-2 pilot's manual.
- Engine Temperature Limits
  - Min 35 deg C for oil required for takeoff
  - Max 95 deg C for oil for normal operation
  - Min 40 deg C for water coolant required for takeoff
  - Max 95 deg C for water coolant for normal operation

Oil Temp (deg C)

Water Radiator Coolant Temp (deg C)

Complex Engine Management

- **Takeoff**:
  - Rads fully open
  - Max RPM, 1.35 ATA (1 minute max)
- **Climb**:
  - 1.15 ATA
  - 2300 RPM
  - 30 min rating
- **Operation limits**
  - 1.35 ATA / 2400 RPM (1 min max)
  - 1.15 ATA / 2300 RPM (30 min max)
  - 1.10 ATA / 2200 RPM: Max Continuous Power
- **Supercharger** (increases Manifold Pressure @ higher altitudes)
  - Unlike other superchargers models in the game, the He-111's supercharger has an "automatic" mode and a "manual" mode.
  - Lshift + S to toggle supercharger stages
  - Make sure not to overrev the engines and monitor your ATA (must not exceed 1.15 (30 min max)) once second stage has been engaged.

How to Read a Fuel Gauge

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HOW TO READ FUEL GAUGES

He-111 has 5 fuel tanks: two in each wing and one in the fuselage. Here is an example of how to read a gauge. Fuel quantities are purely for illustrative purposes… Yawn.

For each wing tank:

The upper dial from 0 to 6 stands for 0 to 600 litres. (wing tank # 1)

The lower dial from 0 to 10 stands for 0 to 1000 litres (wing tank # 2)

For the Fuselage tank:

The dial from 0 to 8 stands for 0 to 800 litres (fuselage tank)

Normally, you could switch between the 2 different fuel tanks on a single gauge with a toggle, but this functionality is not implemented in BoS.

Instead, the fuel gauge will cycle automatically and periodically between tanks.

WHY A MISSION PLAN?

- Bombing missions require careful planning in order to be successful.
- If you fail to plan your mission properly, you most likely plan to fail.
- There is an infinity of variables, things that can go wrong during a bombing mission. However, some mistakes are avoidable and you can have control on some of these parameters.
- The best plan is not necessarily the shortest route to target. The best plan is often the most adaptable and flexible one.
- Sometimes, a bomber pilot will be forced to improvise. Always make sure that you have a plan B in case plan A goes wrong. Flexibility is the key.
- Getting shot down happens, and it is part of the game. Don’t take it personal and think of how (or if) you could have avoided your untimely death. Just think of how you can do better next time!

PART II: MISSION PLAN

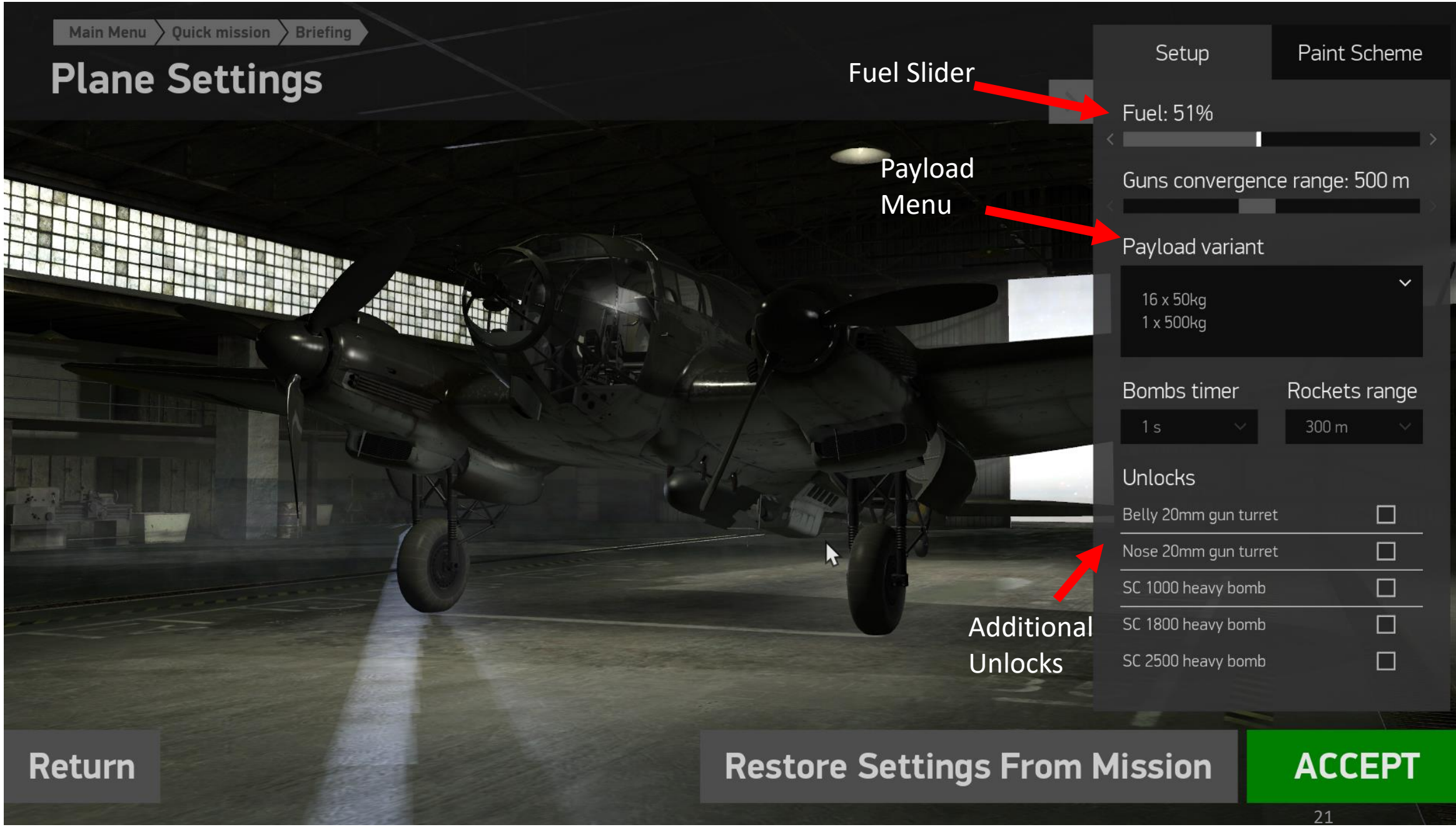
HOW TO PLAN A MISSION

- When planning a mission, you don't have to do it alone. Consult your fellow wingmen and even fighter escorts to give you intel that will help you shape your flight route accordingly to avoid patrolling enemy fighters and potential danger zones.
- Before you even takeoff, you need to know what you are going to do and how you are going to do it. Typical high-altitude bombing missions are used to knock out enemy airfields, factories or targets clumped up in a relatively small area. For smaller individual targets, you are better off dive bombing as high-altitude bombing is not as precise.
- Make sure you communicate your position, status and intentions to your teammates. You might be surprised how many people are craving to wing up with you or even escort you to your targets. Fighter jocks can also be team players, believe it or not.

WHAT TO PLAN FOR

- Your aircraft performance will be altered by mainly 2 factors: your bomb loadout and your fuel quantity (in %). Typical bomb runs are achieved with 30-40 % fuel. Why? Because they influence your aircraft's weight. (And people are just too lazy to calculate what they really need.) The heavier you are, the slower you will climb and the more vulnerable you will be.
- German bombs are designated simply by their weight in kg. For instance, the SC-1800 bomb stands for "Sprengbombe Cylindrisch" (explosive cylindrical bomb) for a weight of 1800 kg.
- Different bomb loadouts do not all have the same weight (unlike for the Pe-2). Your choice of bombs will directly impact your weight. Your maximal bomb loadout weight is 3600 kg (2 x SC-1800).
- With a fuel capacity of approx. 3500 litres (~2500 kg), we can make the (very veeery conservative) assumption that its max range fully loaded is 4000 km. In reality, with a heavy load, the range would be much less than that. Let us take these numbers for the simple reason that I don't have all day and that the Battle of Britain Historical Society probably didn't get these numbers out of thin air. I just wished I found the sodding manual… but I hear life's not perfect. Whatever. I ain't even mad. Seriously.
- Moving on.

PART II: MISSION PLAN

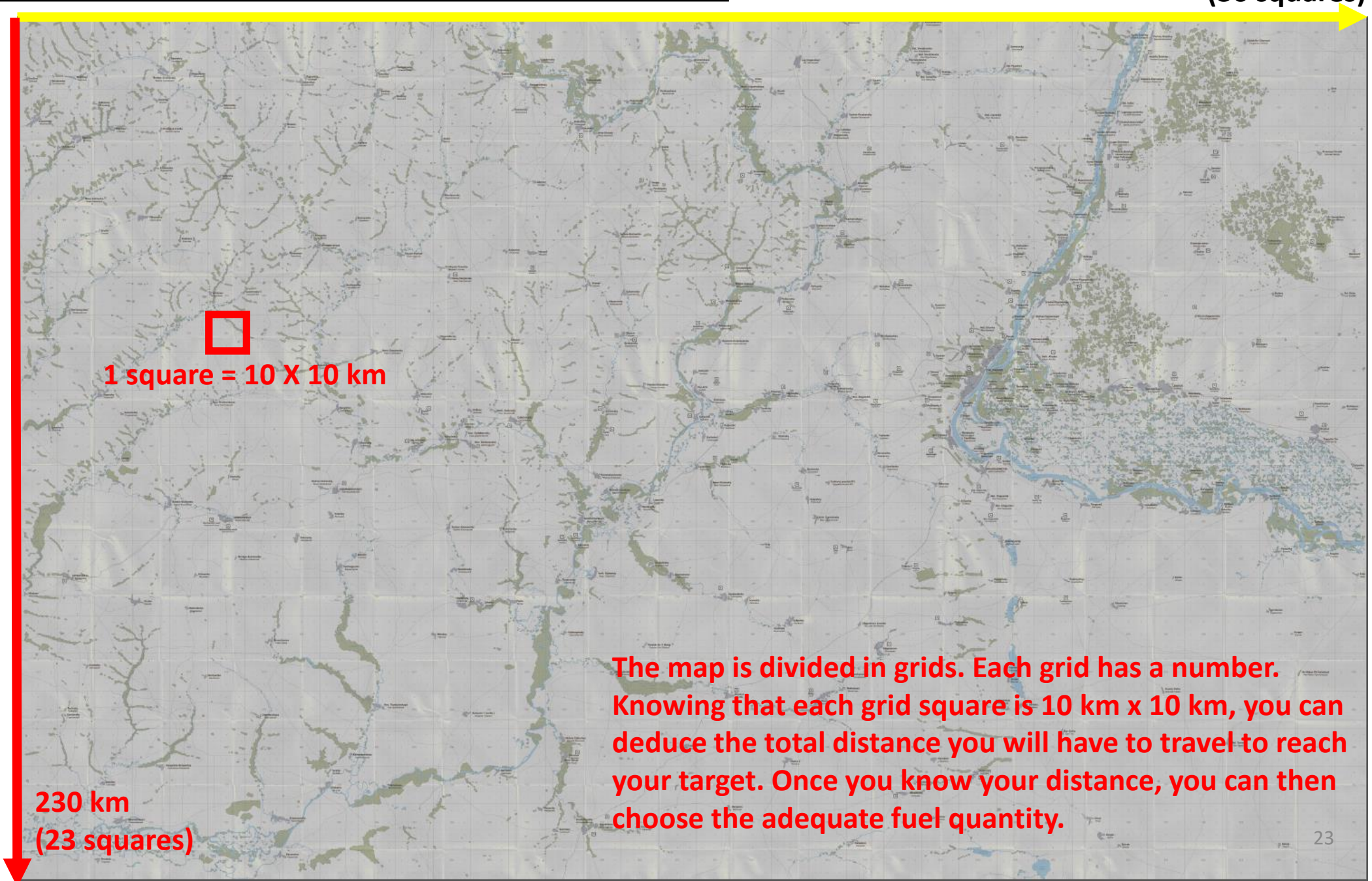


HOW TO CALCULATE YOUR REQUIRED FUEL

- You can calculate how fuel you will need pretty easily if you want to optimize your aircraft's capabilities during the missions. The less fuel you bring, the faster you'll go, the easier you will climb and the more fuel-efficient your aircraft will be.
- The He-111's fuel tanks have a maximal capacity of approx. 3500 litres.
- The He-111's maximal range is 4000 km.
- Hence, we can deduce that you will need approx. 0.9 litre per km (which is strangely comparable to the Pe-2's approximated value), or inversely that you will travel approx. 1.2 km per litre of fuel.
- If you know what your trajectory will be, you can easily know how much fuel you need to get there and come back.
- To judge your total distance, you can use the in-game map and plot your course at the same time.

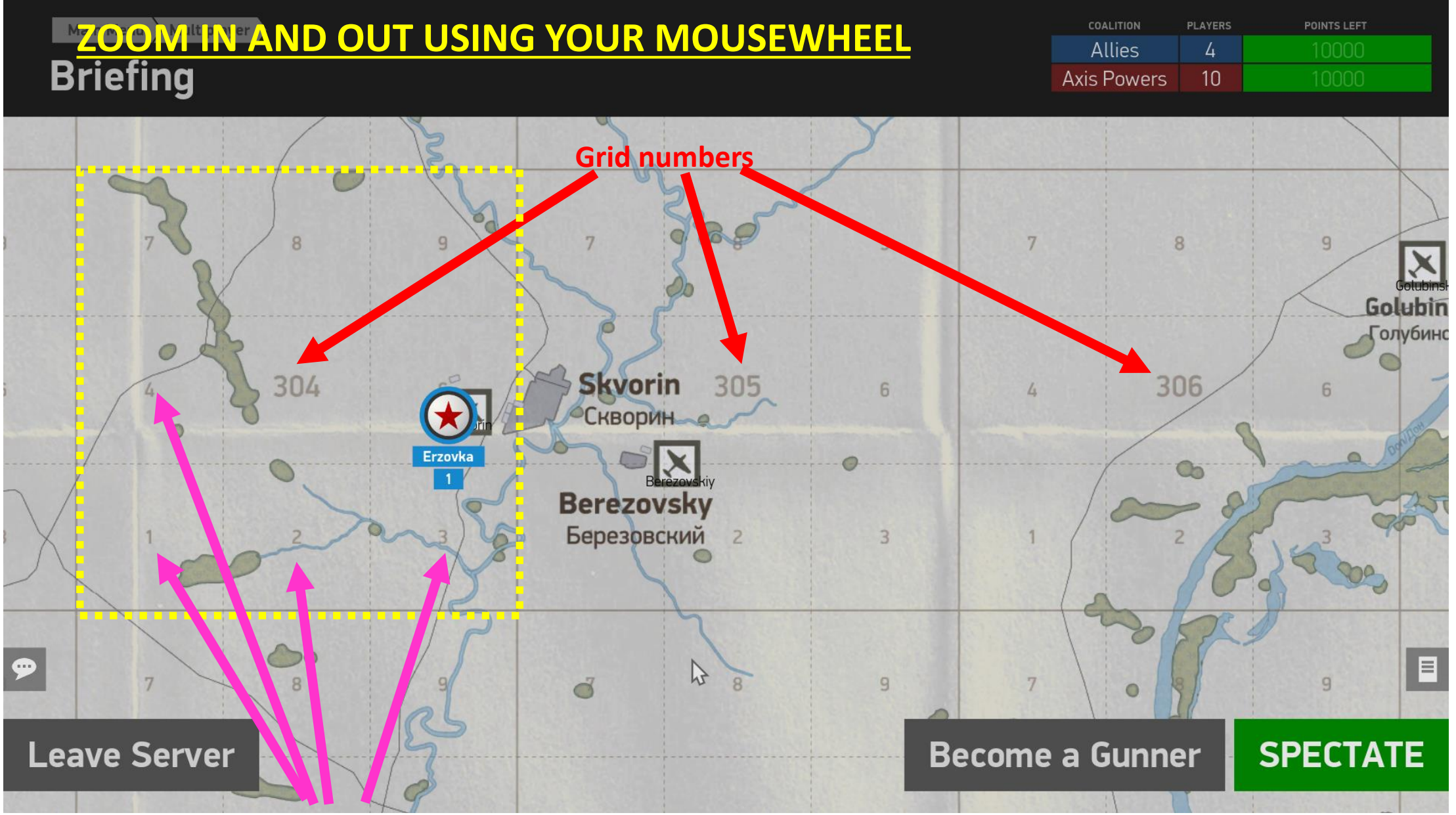
PART II: MISSION PLAN

CHECK THE MAP BY PRESSING “O”



PART II: MISSION PLAN

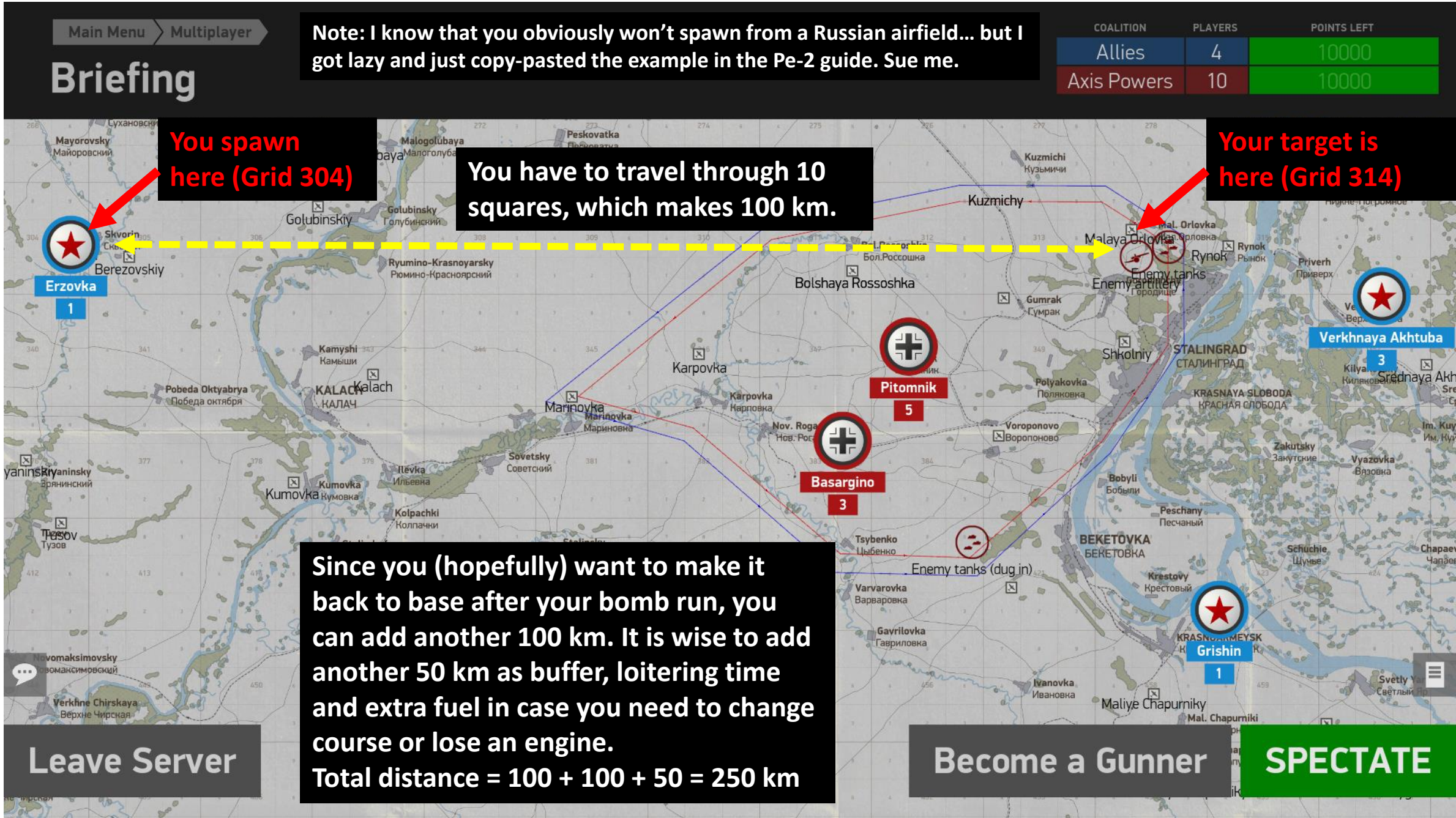
ZOOM IN AND OUT USING YOUR MOUSEWHEEL



Sub-quadrants
(structured like a numpad)

PART II: MISSION PLAN

PLOT AND PLAN YOUR COURSE



HOW TO CALCULATE YOUR REQUIRED FUEL

- Now that we have a rough estimate of our flight path, we know that we need fuel to travel 250 km.
- Knowing that our plane consumes approx. 0.9L/km:
- Required fuel = 250 km X 0.9 L/km = 225 L
- Out of a capacity of 3500 freaking Litres, we need roughly 7 % fuel.
- You can also consider it in a matter of time. The He-111 will travel approx. 4 km/min if it maintains 240 km/h in a climb.
- To fly 250 km (not counting loiter time), you can simply calculate: 250 km / 4 km/min = 62.5 min of flight time for the whole mission.
- Using the same thought process, we can evaluate the maximal fuel % we'd need to make the longest bombing run ever. Let's calculate it, just for fun.
- Knowing that the maximal distance you would have to travel is the whole diagonal of the map (425 km, so 850 km for a full flight), the longest flight you could make from point A to point B back and forth would require 720 L of fuel, which is slightly less than 20 % of your tank capacity (3500 L).

HOW TO CALCULATE YOUR REQUIRED FUEL

- As you can see, we now know that we do not really need 50 %, 40 % nor 30 % of that fuel we wanted to bring earlier. Just by making a quick estimate, we saved up to 40 % fuel, and our aircraft is now 1000 kg lighter, which is about the weight of this bloodthirsty Russian bear.

- The lighter your aircraft is, the easier time you will have climbing. And the higher you are, the less likely you are to get bounced. Also, altitude allows you to have a better view of the landscape and navigate visually.

PART III: TAKEOFF

- Taking off in the He-111 is straightforward if you follow these steps for a cold engine start.

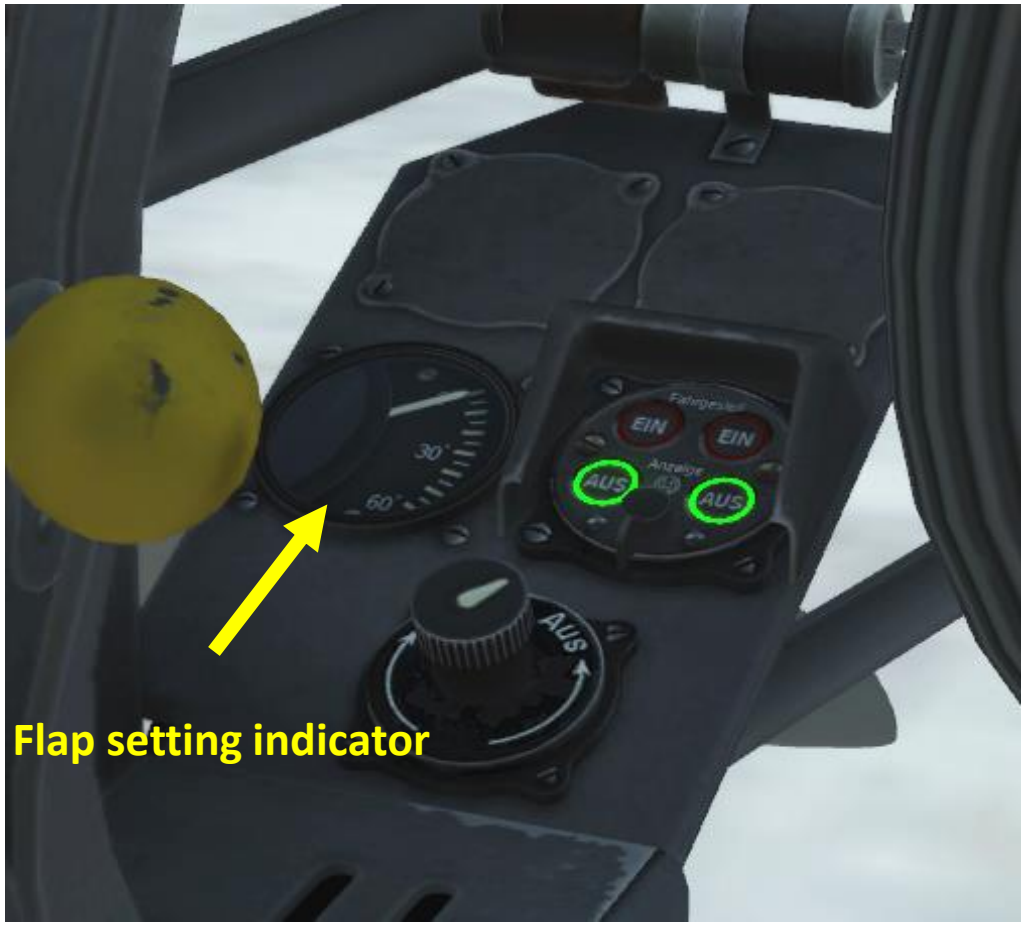
1) Crack your throttle about 10 %

2) Set your mixture to full rich

3) Close your water and oil radiators

4) Set maximum RPM

5) Ignite (“E” key by default)!



6) Set your flaps to 15-20 degrees. Keep in mind that your flaps switch is continuous and will keep moving your flaps as long as you hold it. If your flaps are deployed too much (over 30 degrees), you will simply stall, crash and burn on takeoff. Consult your flap indicator to make sure that you are set up correctly.

PART III: TAKEOFF

7) Wait for your oil radiator temperatures to reach 35 degrees C and your water radiator temperatures to reach 40 degrees C.

8) Line yourself up on the runway using your toe brakes and lock your tailwheel by pulling your stick back to keep your tailwheel down.

9) Fully open your water coolant and oil radiators.

9) Throttle up full power (1.35 ATA), max RPM. Correct heading with small rudder input.

10) As soon as you reach 100 kph, center the stick and level out to pick some speed.

11) When you reach 150 kph, rotate gently.

12) Once you are up in the air, retract flaps, pull your gear up and start climbing. Adjust RPM and manifold pressure accordingly (see engine management in part I).

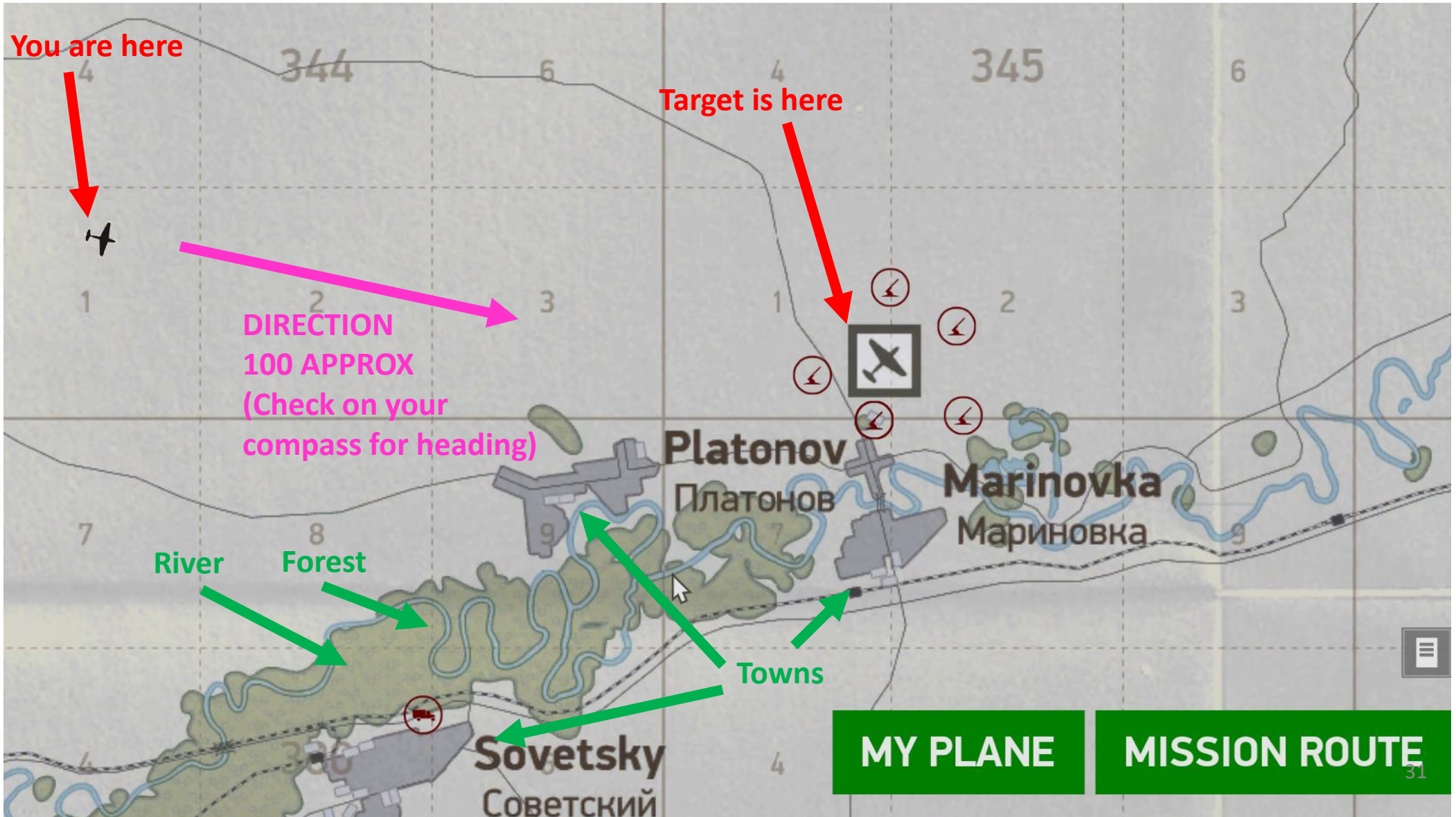
PART IV: NAVIGATION

- Now that we are up in the air and that we know what our mission will be, let's do an example. We cannot bomb our target if we cannot find it, right?
- First, let's make a brief summary of the mission.

1. We are going to bomb an airfield.
2. We will bomb our target at an altitude of approx. 3000 metres with 1 X 2500 kg and 1 X 1000 kg bombs. The altitude is not set in stone, but more of a general idea.
3. We will approach the target from the East.
4. In this case, we will go in alone. But if you lead a bomber wing, it is important for the leader to give his speed and engine settings to his wingmen in order to allow them to form up easily on you. Generally, bomber formations will drop on the bomber lead's go while wingmen will maintain formation. By managing the workload in this way, precision is maximized and coordination maintained throughout the bombing run.

PART IV: NAVIGATION

- Here is an overview of where the map is located and where we currently are. Spot landmarks that you could recognize.



PART IV: NAVIGATION

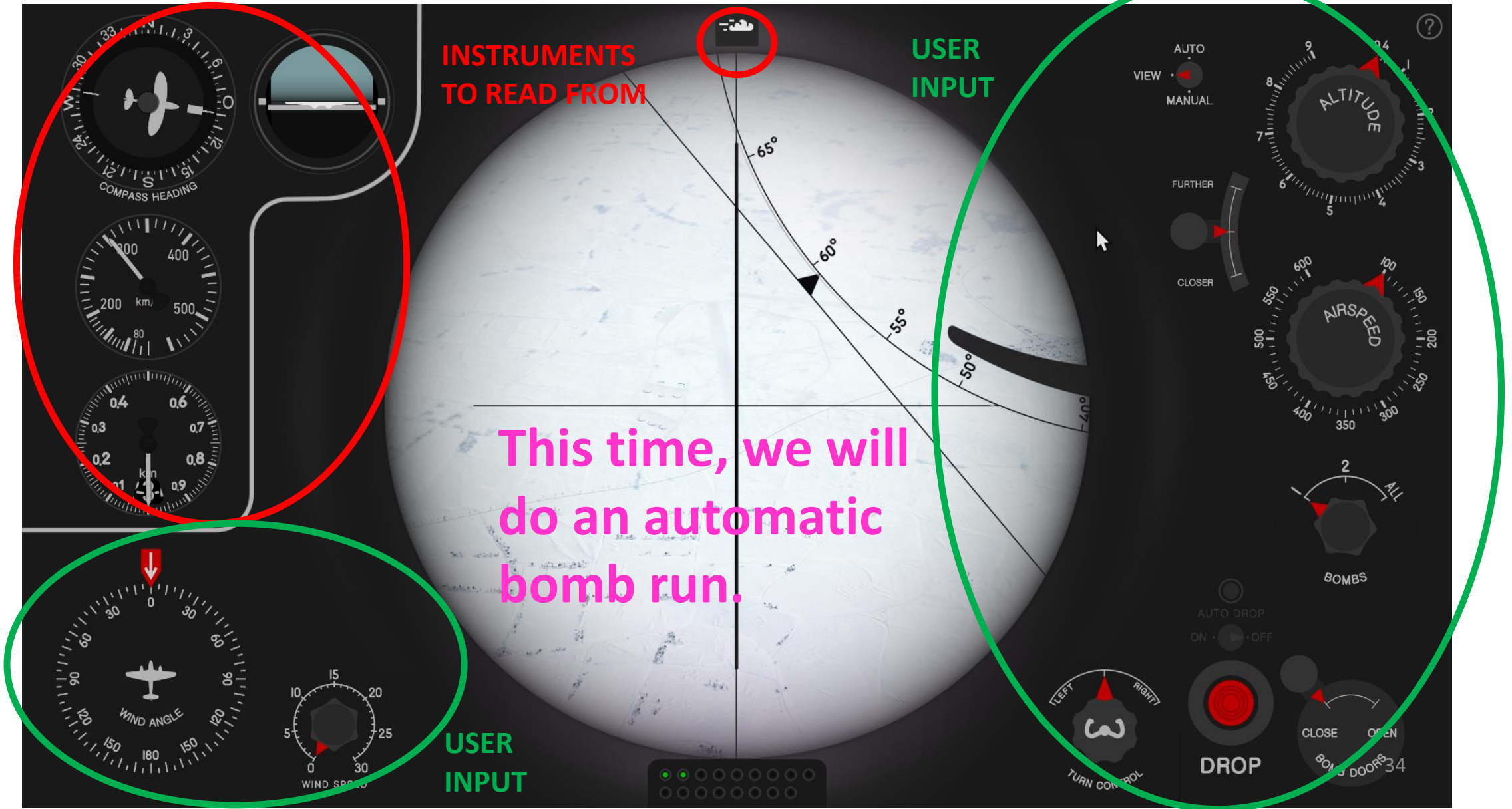
- Here is an overview what you see in your nose gunner's position (LCtrl+C). Recognize anything familiar?

PART IV: NAVIGATION

- Here is an external view. So? Aaaah, yes, it all comes together now, does it? Let's turn a bit and try to find our target using the bombsight.

PART IV: BOMB RUN

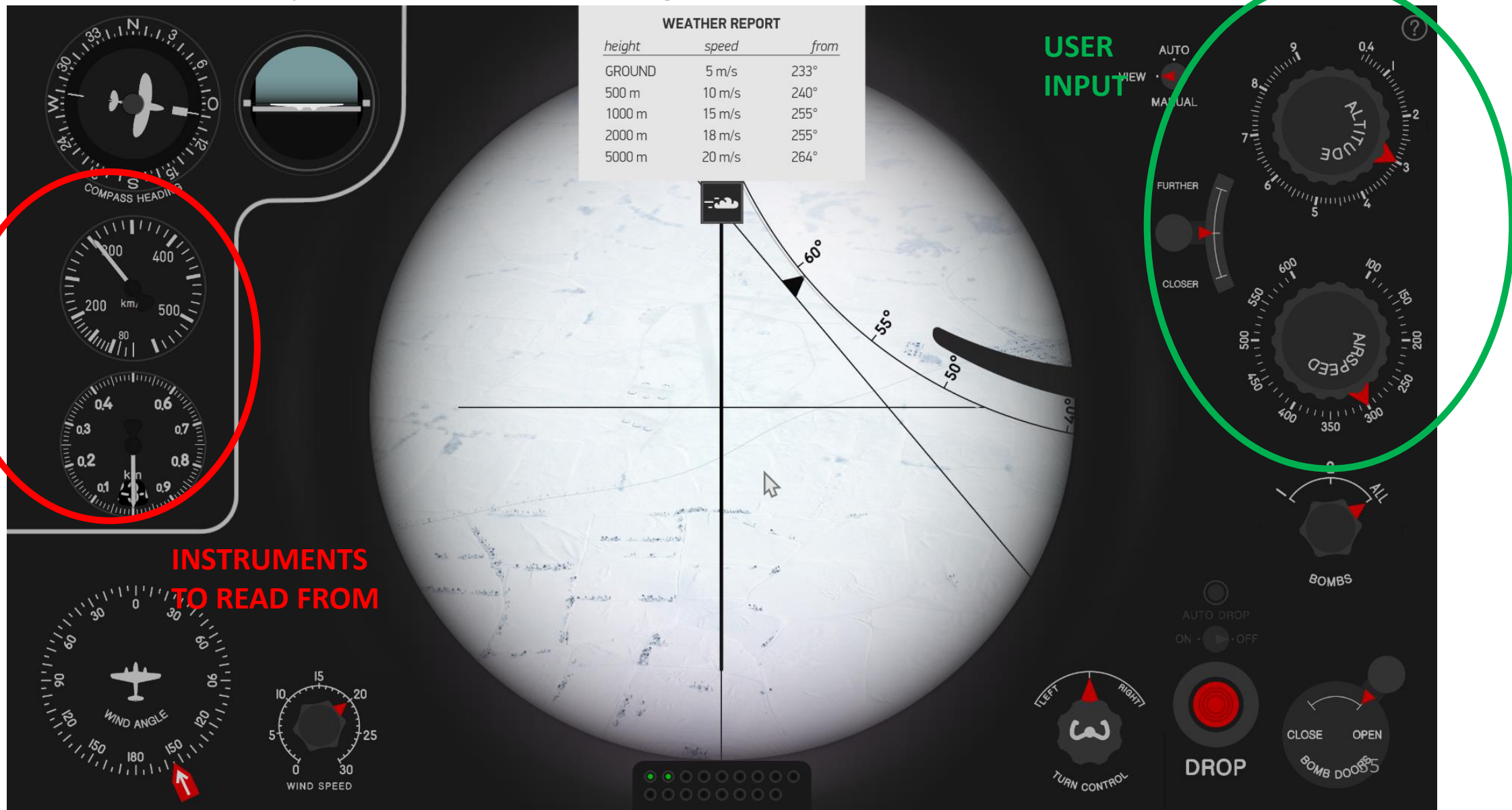
- Now comes the toughest part: understanding the bombsight and using it properly. It requires a lot of preparation, so make sure you are all set beforehand. To use the bombsight, press “V”.



PART IV: BOMB RUN

Engage the level-auto-pilot (LAlt + A) and enter speed and altitude.

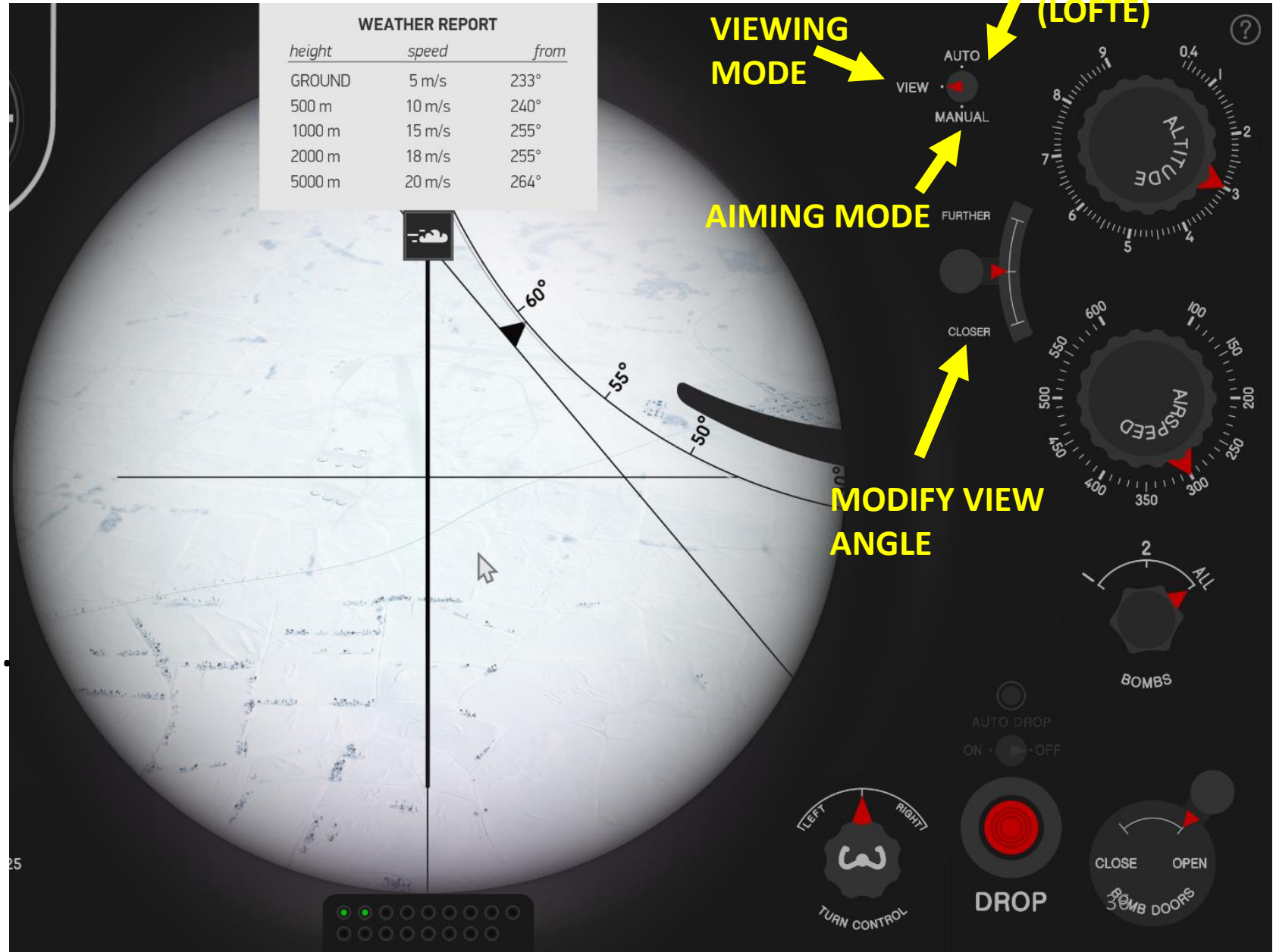
Tip: decide your speed and bombing altitude beforehand and set your bombsight on the ground. You will win precious time in doing so.



PART IV: BOMB RUN

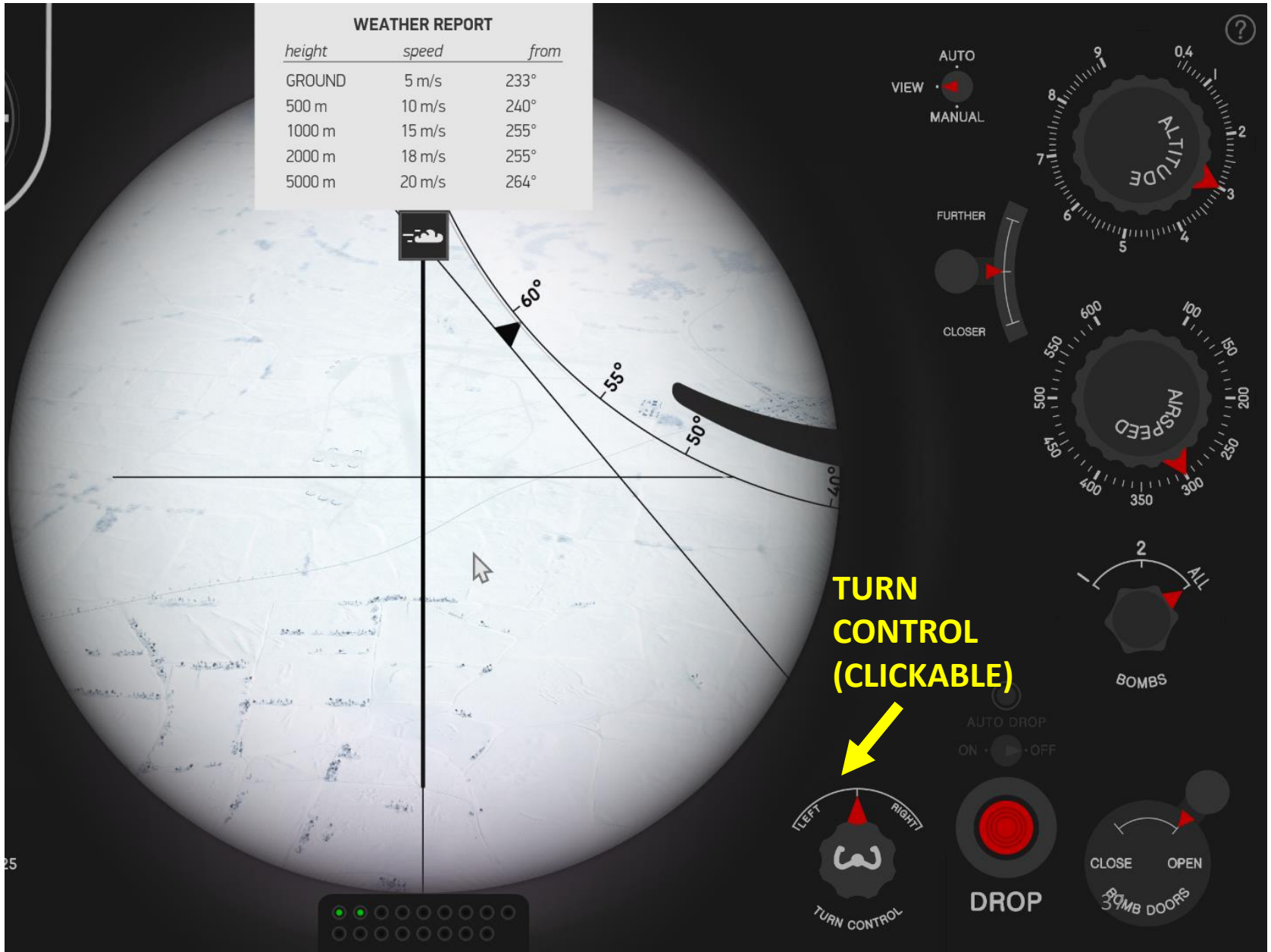
- 2) Choose the bombsight “View Mode” by clicking on it and change your view angle to where you can see farther in front of you. You can hold left mouse btn to change angle smoothly.

  We see the runway and we are pretty much lined up on it.



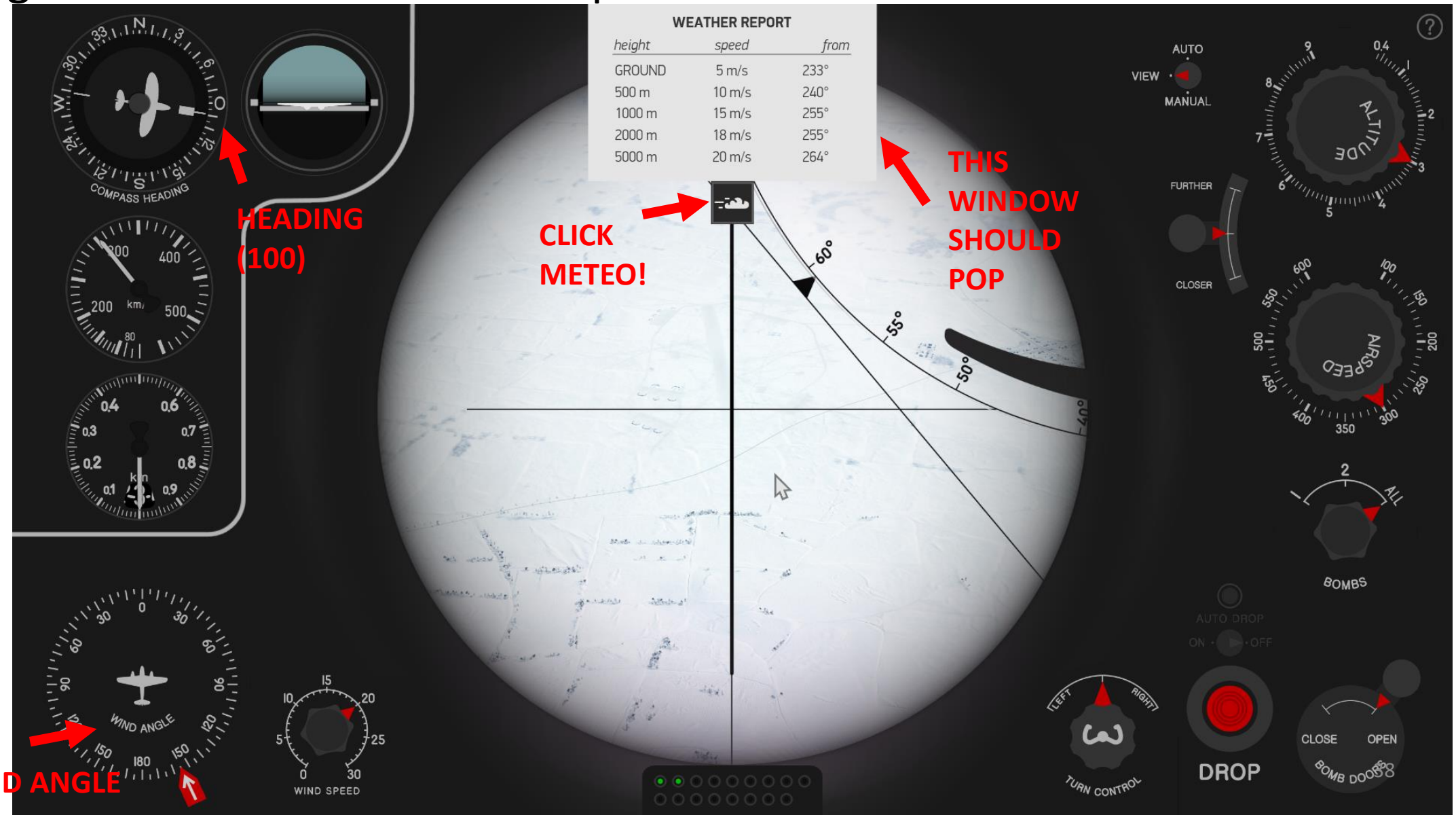
PART IV: BOMB RUN

3) Steer your aircraft using the turn control (Lshift Z = LEFT, Lshift X = RIGHT) to make corrections. Your aircraft will swing left and right, This is normal. Just make sure your sight is aiming straight for your target.



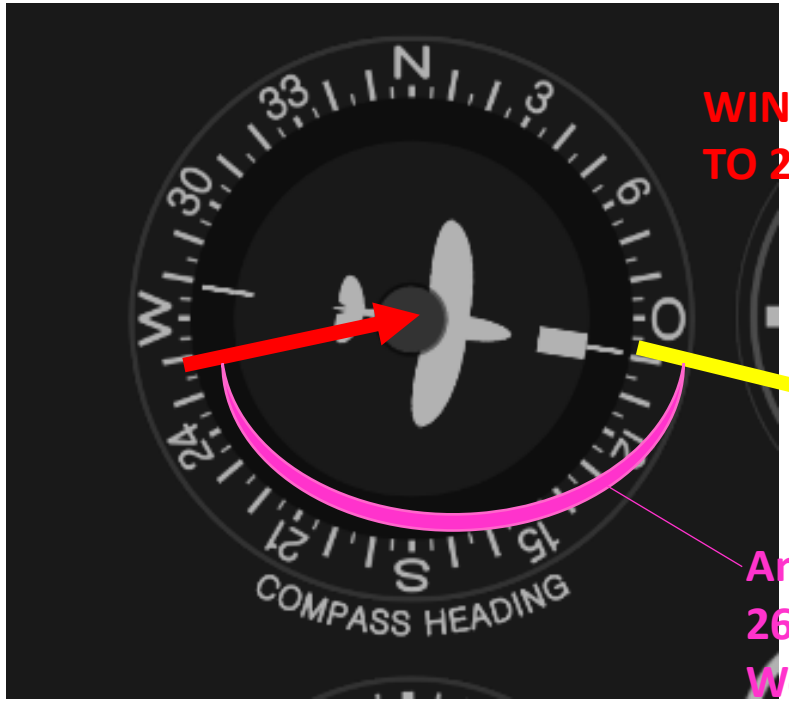
PART IV: BOMB RUN

- About 1 minute before bomb run, check for wind correction by consulting meteo conditions… Once again, you can do this on the ground beforehand and win precious time.



PART IV: BOMB RUN

- Here is how you get your wind angle.



WIND FROM 260 approx
TO 260 - 180 = 80 DEG

DIRECTION OF AIRCRAFT (GREY ARROW): 100 DEG

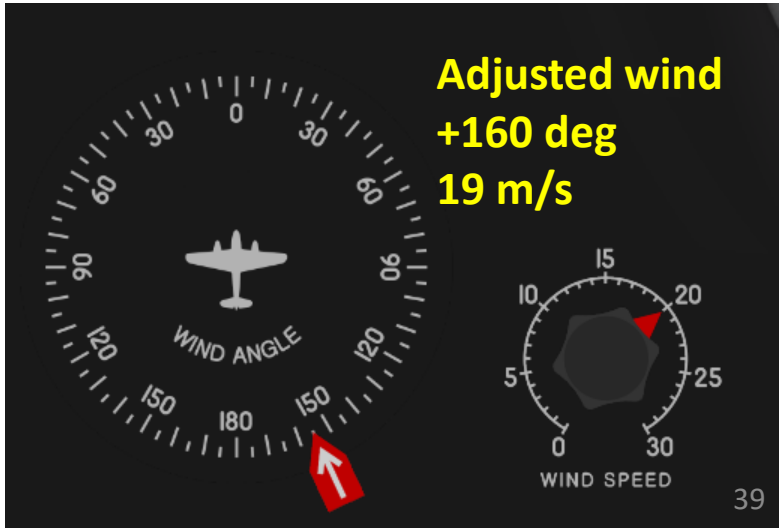
Angle between aircraft and wind:
260- 100 = 160 deg
We choose + 160 because the wind is pushing you from your right.

WEATHER REPORT

height	*speed*	*from*
GROUND	5 m/s	233°
500 m	10 m/s	240°
1000 m	15 m/s	255°
2000 m	18 m/s	255°
5000 m	20 m/s	264°

At 3000 m, it is reasonable to predict a wind from approx. 260 deg for a speed of 19 m/s.

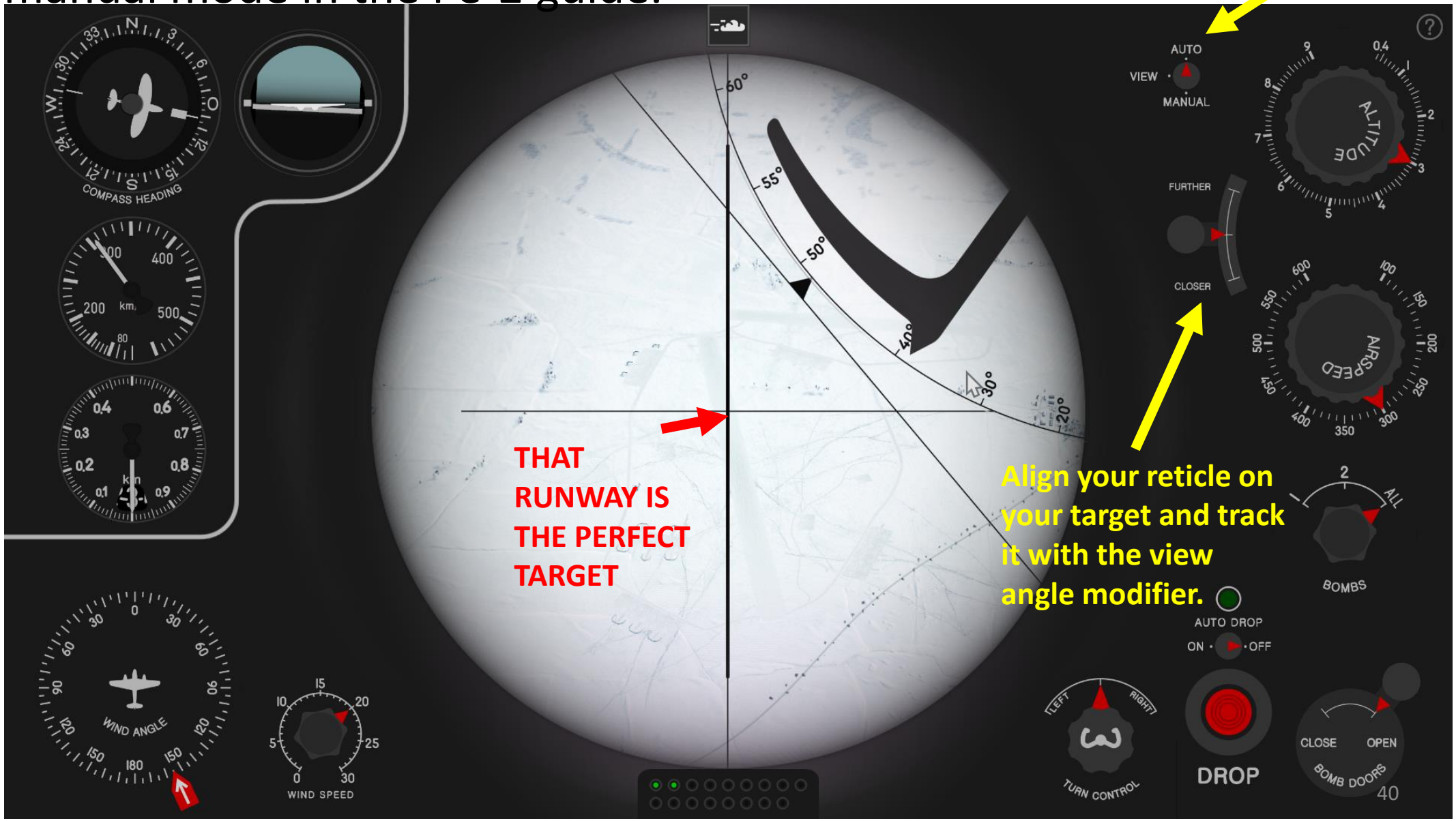
Red/white arrow is the direction where the wind will push your aircraft.



Adjusted wind
+160 deg
19 m/s

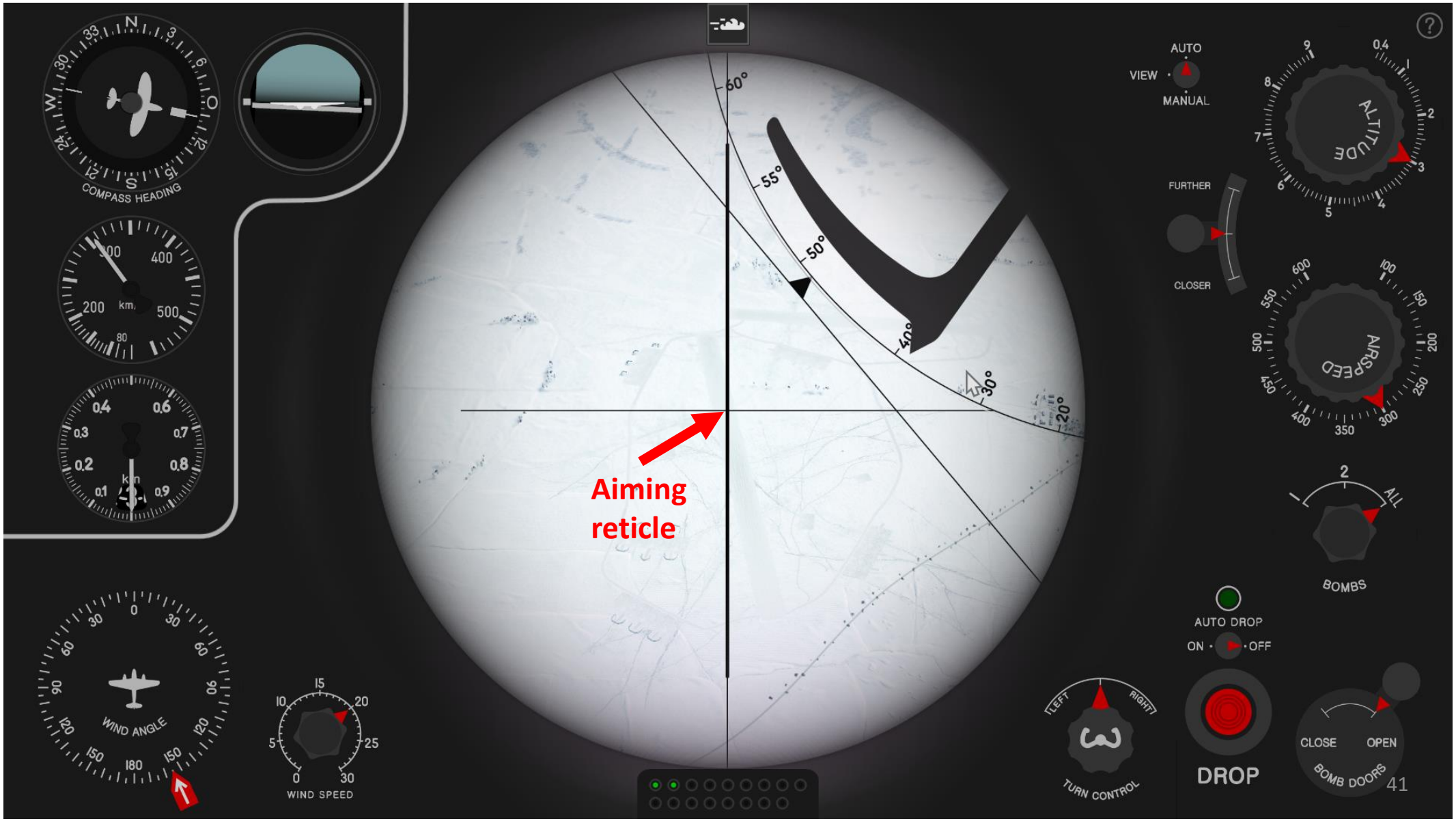
PART IV: BOMB RUN

- Find your target using your view mode. Once it's done, we will engage the LOFTE Auto mode as we did the manual mode in the Pe-2 guide.

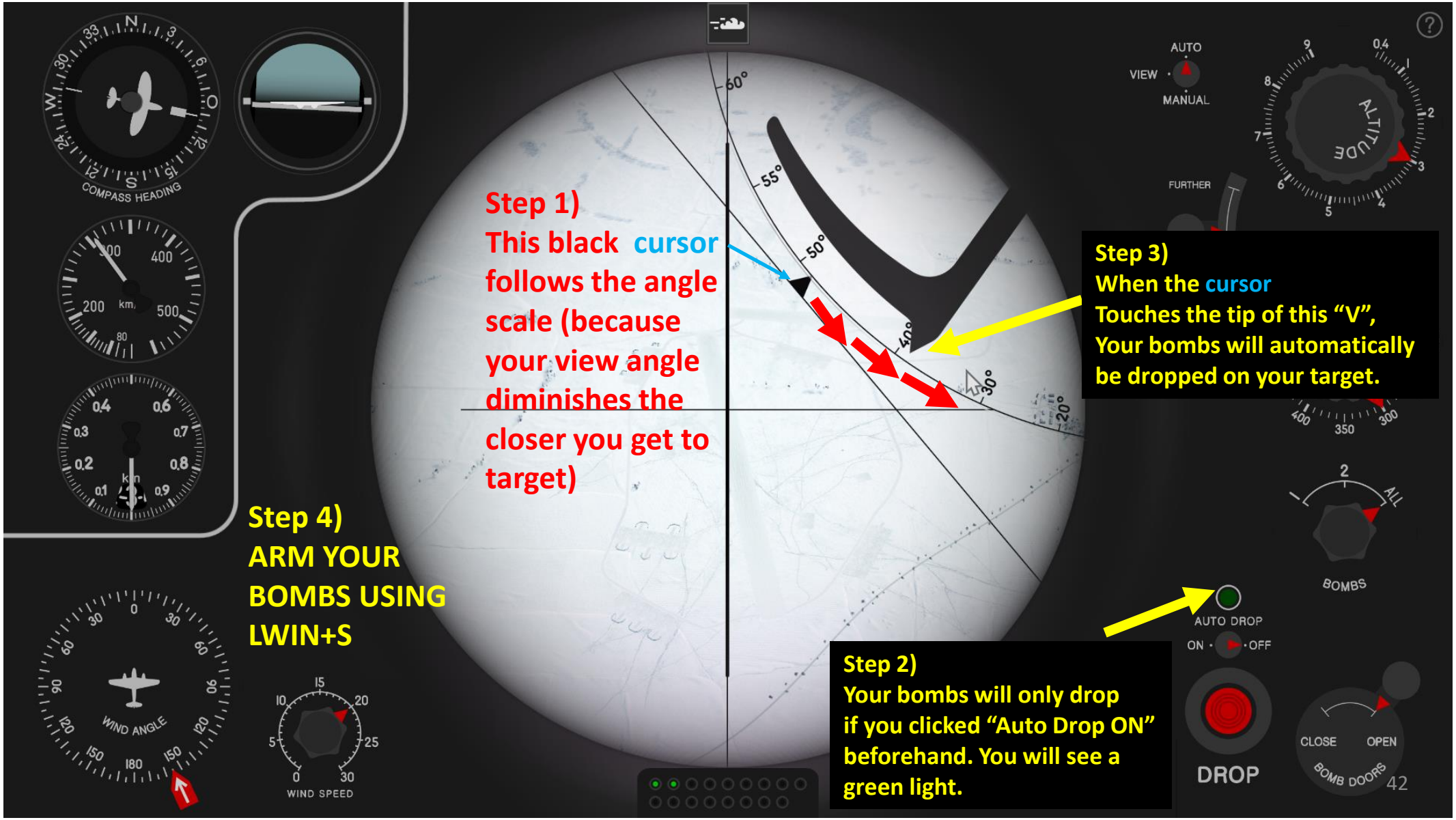


PART IV: BOMB RUN

- Now, here is the tricky part. Auto mode basically tracks a point that you set with your auto-pilot (steering left and right) AND with your view angle modifier. Your sight will not move ONLY if your altitude and speed are the same as you have entered in the bombsight. If your sight drifts in auto mode, check your inputs and steer your aircraft with the auto-pilot. Now, you need to know how to tell the bombsight to drop your ordnance on the point you set while being in Auto Mode.

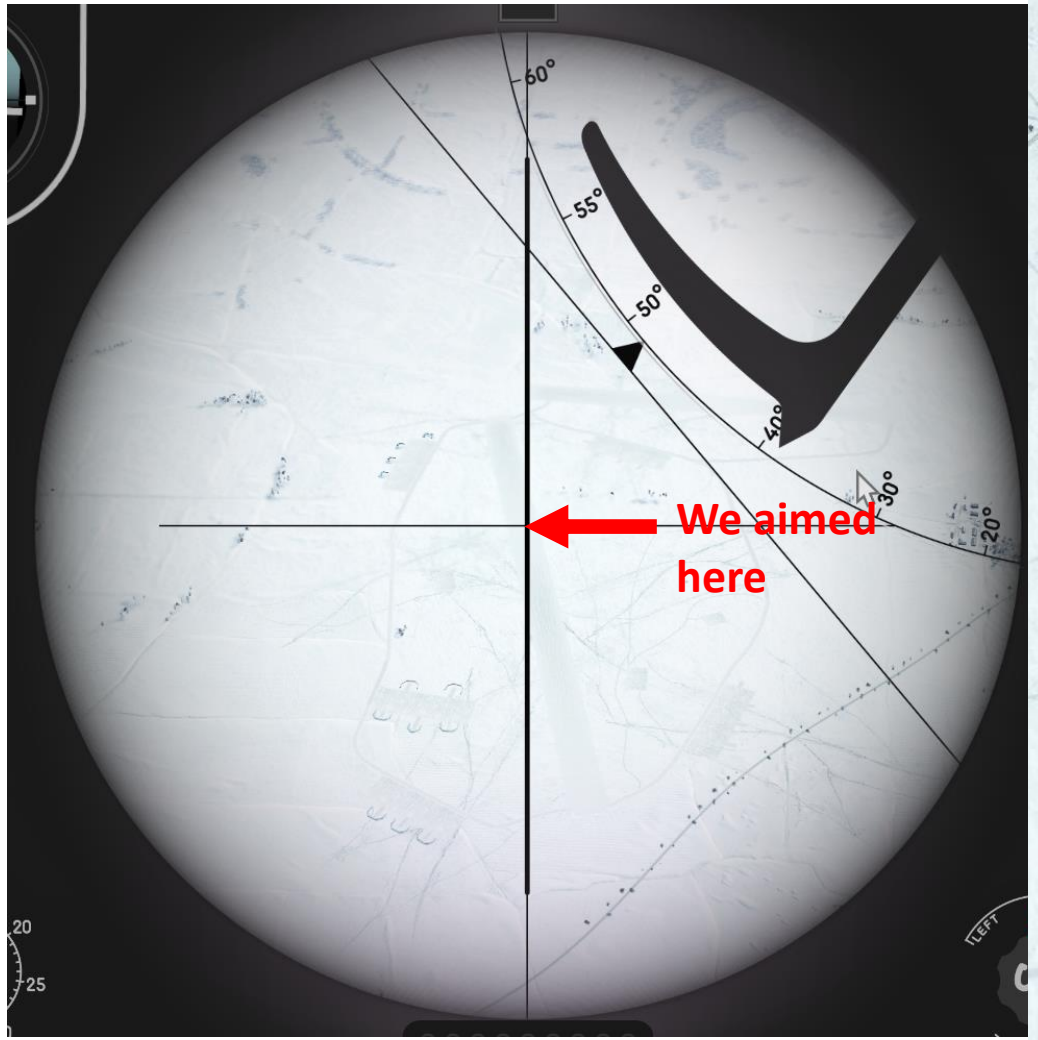


PART IV: BOMB RUN



PART IV: BOMB RUN

- Not bad for a 19 m/s crosswind at 3000 m, eh?



PART IV: BOMB RUN

- I’m afraid the guys below didn’t quite appreciate all the effort we put into it. That was to be expected.

PART V: LANDING

1) Deploy landing gear when going slower than 300 kph.
2) Max RPM, throttle as required to maintain approach speed at 200 kph.
3) Deploy full flaps.
4) Touchdown at 140-150 kph.

PART V: LANDING

5) Pull your stick back to keep the tailwheel down.

6) Tap your toe brakes until you come to a full stop.

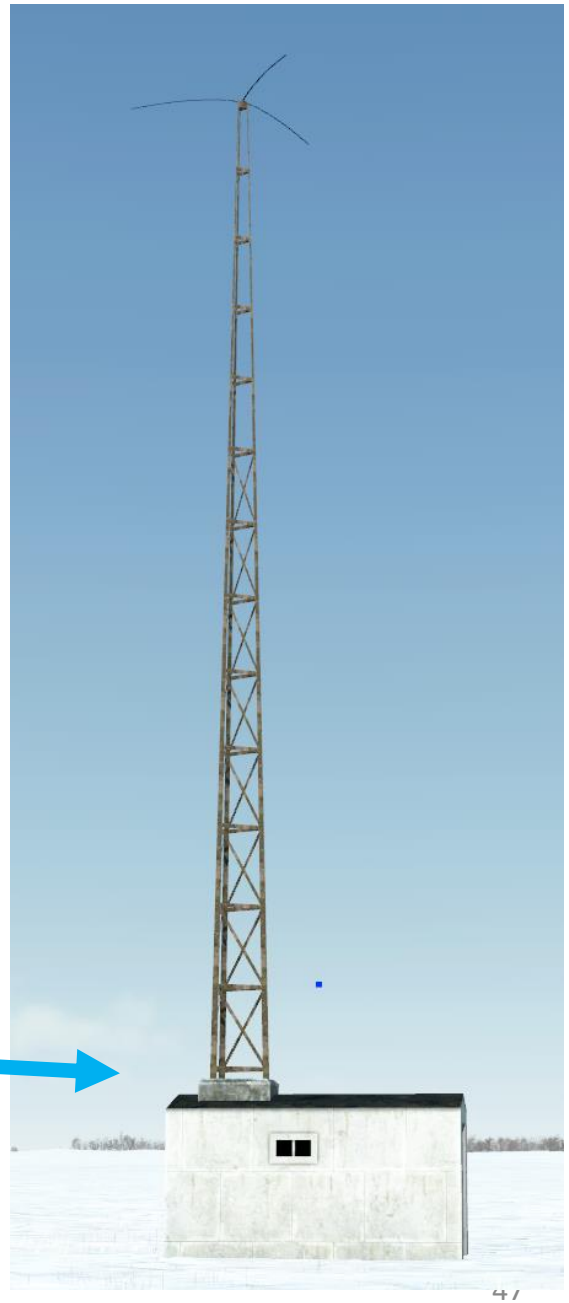
7) Home sweet home.

PART V: LANDING

Blind Approach Tutorial

This needle displays your orientation in relationship to the beacon

This needle displays intensity of beacon signal (currently fixed position)
In reality, it is the distance to the beacon, or in other words the intensity of the signal.



Blind Approach Tutorial

PART V: LANDING

AFN-2 Radio Beacon Indicator
Ln.27002

Vertical needle indicates course deflection

Horizontal needle indicates distance to selected VOR station.
Indicated range: 60 – 0 nautical miles

PART V: LANDING

Blind Approach Tutorial