Scientific flight limitations

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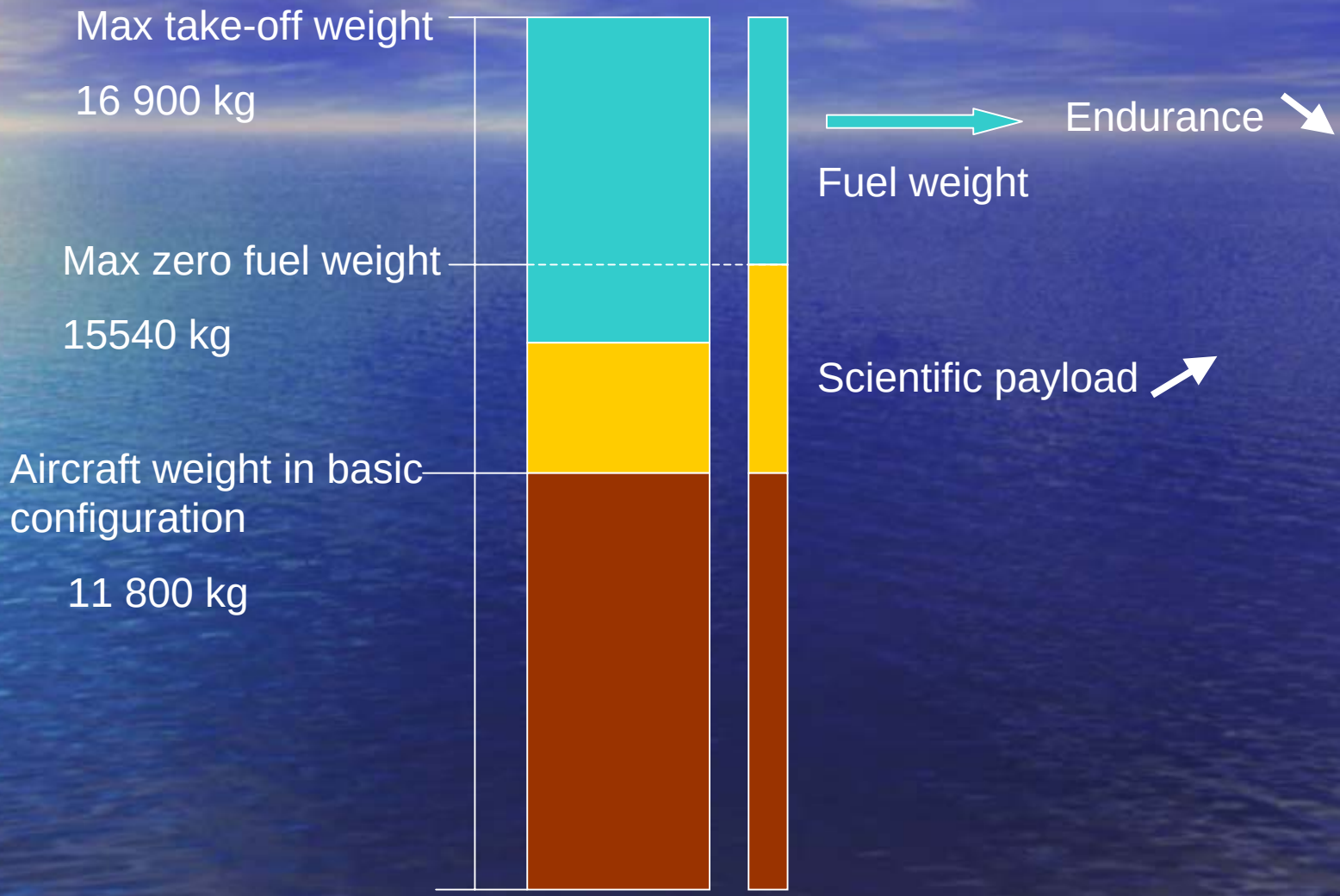
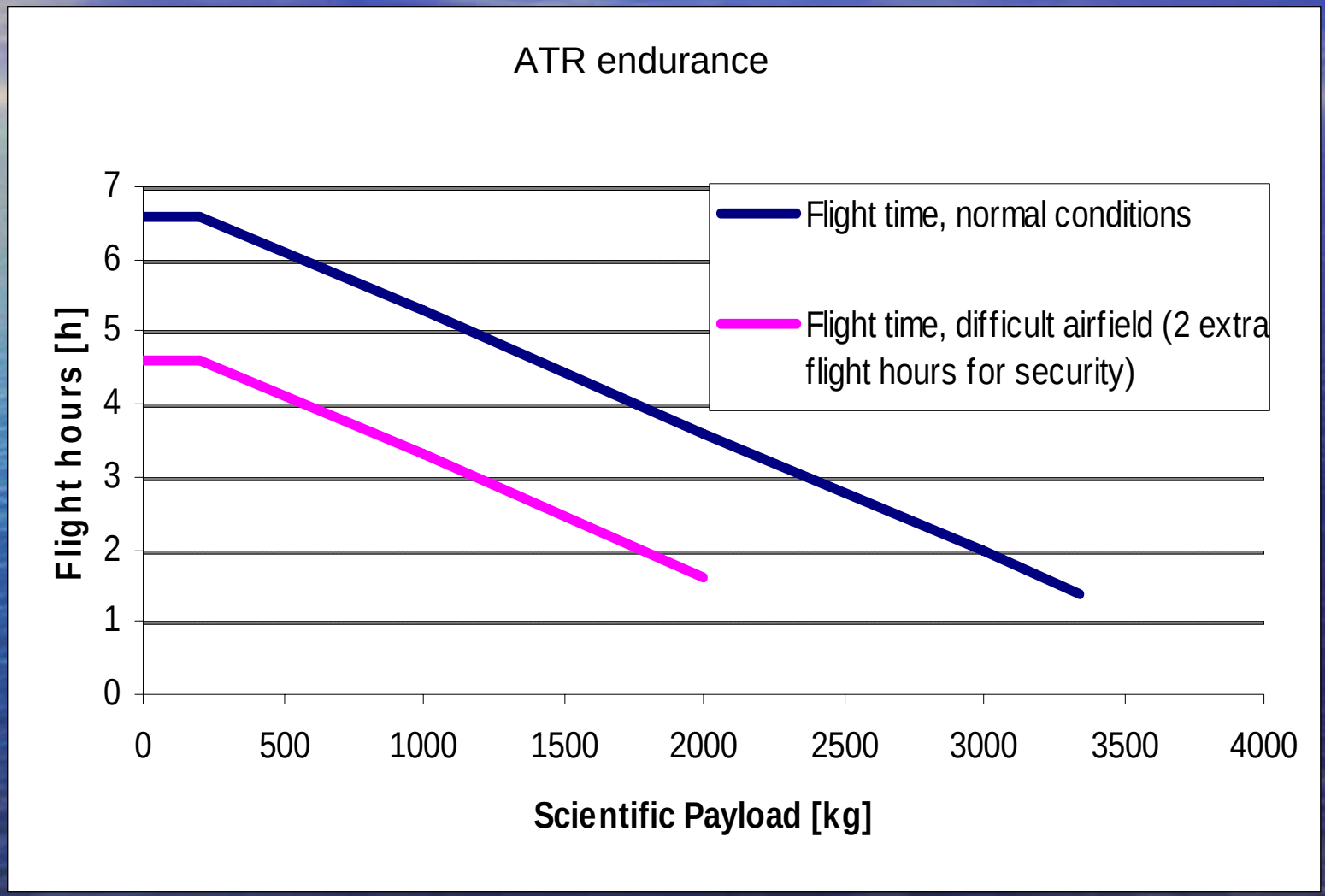
Scientific Payload



Limitations

Scientific Payload

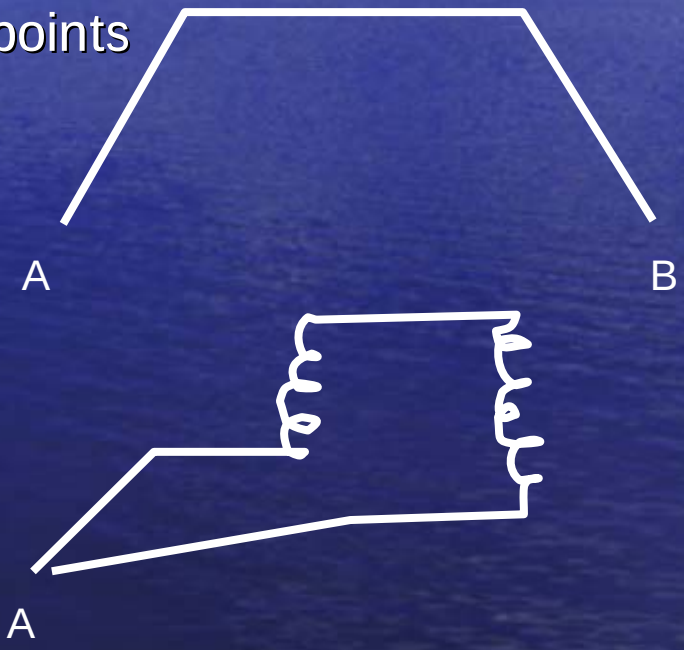


ATC constraints

- The airspace is managed to regulate the civil and military flights and to facilitate the scheduled commercial flights

- Commercial flight
  - Aircraft flies on airways with fixed waypoints
  - Aircraft flies at constant altitude

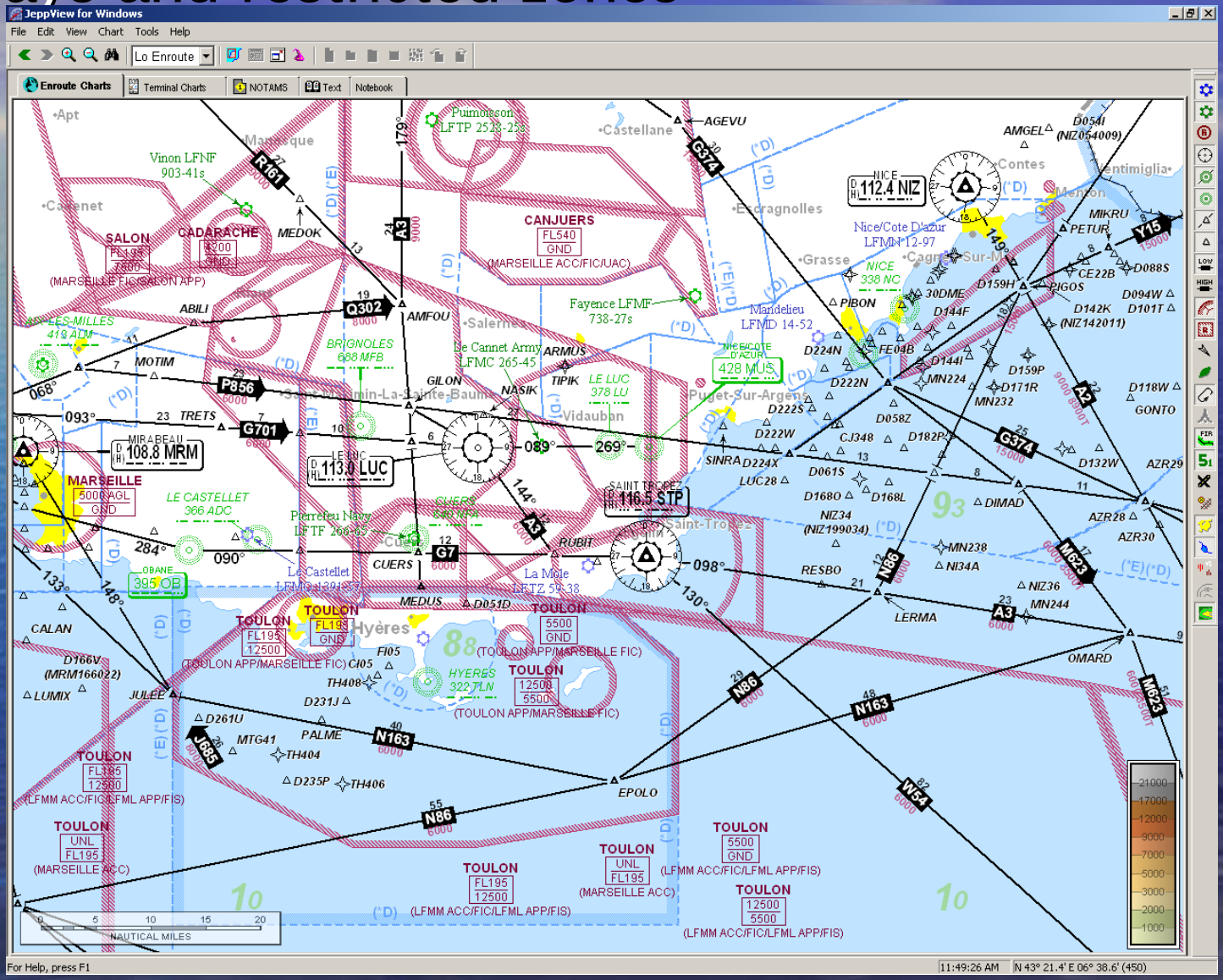
- Scientific flight
  - anywhere in the area of interest
  - different altitudes
  - different flight patterns



negotiation with ATC

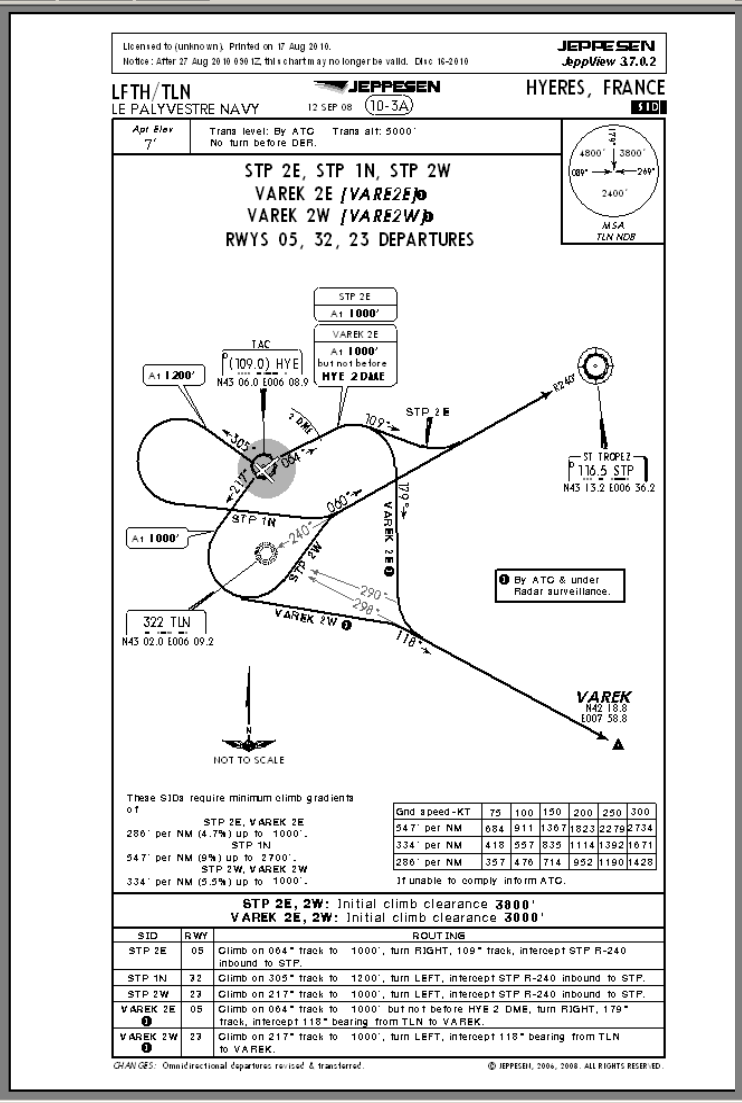
ATC constraints

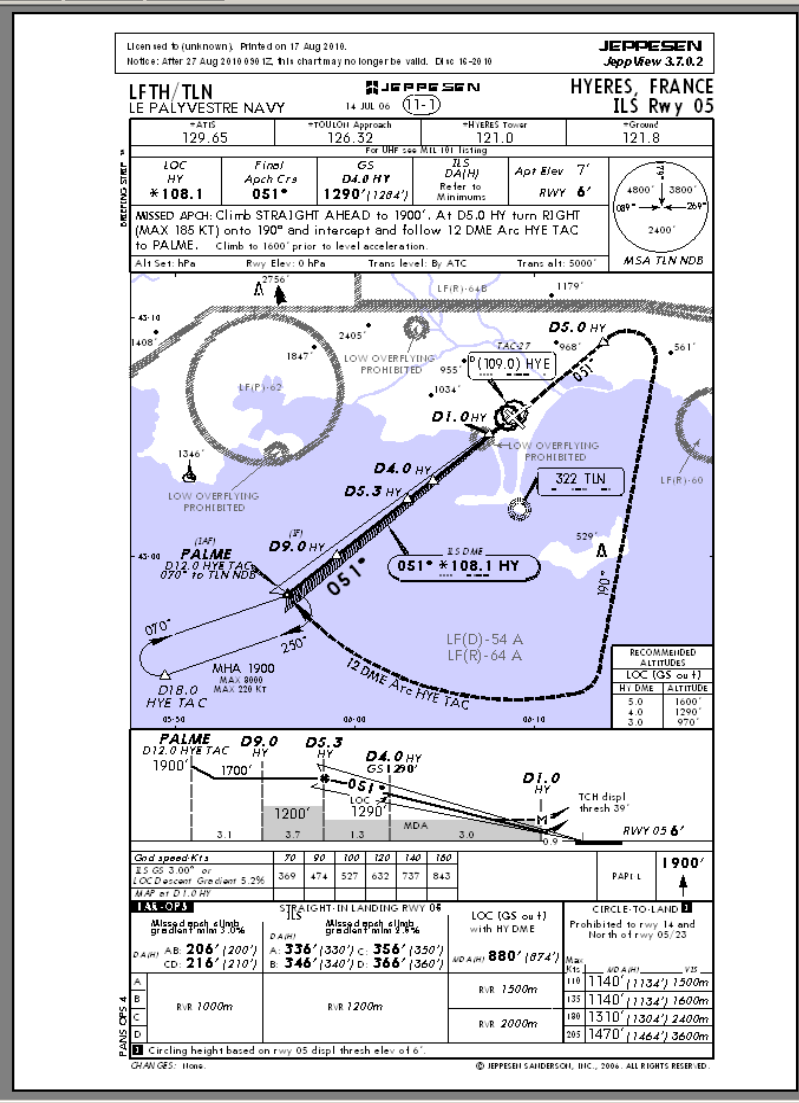
- Airways and restricted zones



ATC constraints

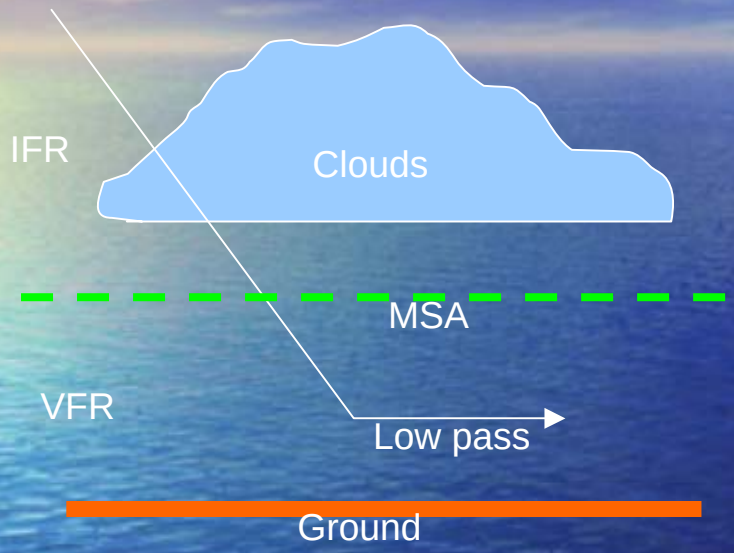
- Trajectories defined for departures and arrivals



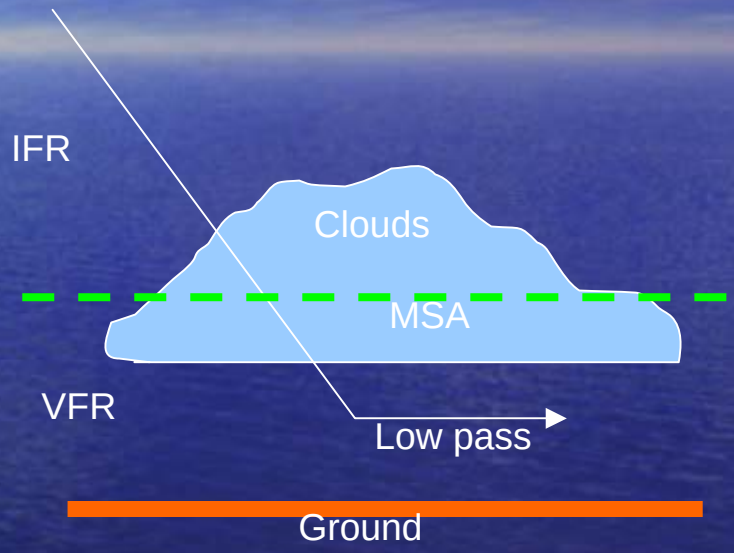


Altitude limitations for low flight

- According to the ceiling



OK



NO

Minimum Safe Altitude from 1000ft (over sea) to 2000ft (over topography)

Altitude limitations for low flight

- Over town

The aviation rules limit the overflight of the built-up areas

	typical size	min altitude
Little town	< 1200m	3300 ft
Medium town	1200m > < 3600m	3300 ft
Large town	> 3600m	5000 ft

Get the permit to fly

- Prepare the flight project with the aircraft operator 6 months before at least
- Describe the trajectories with waypoints and altitude changes
- Trajectories and flight plans must be validated by the aviation authorities
- Authorizations and waivers are necessary to carry out a scientific flight

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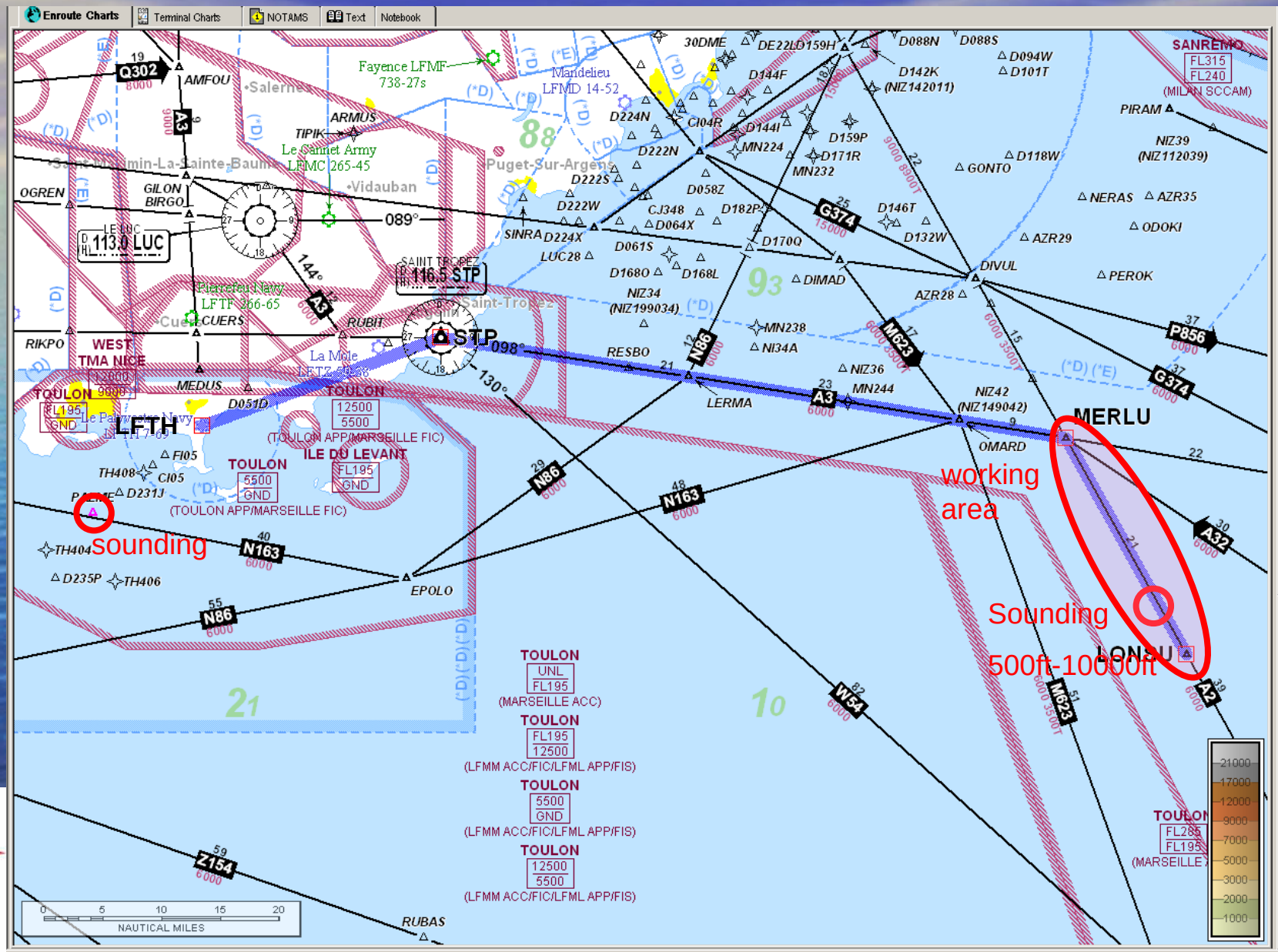
TETRAD-sea mission

200Nm



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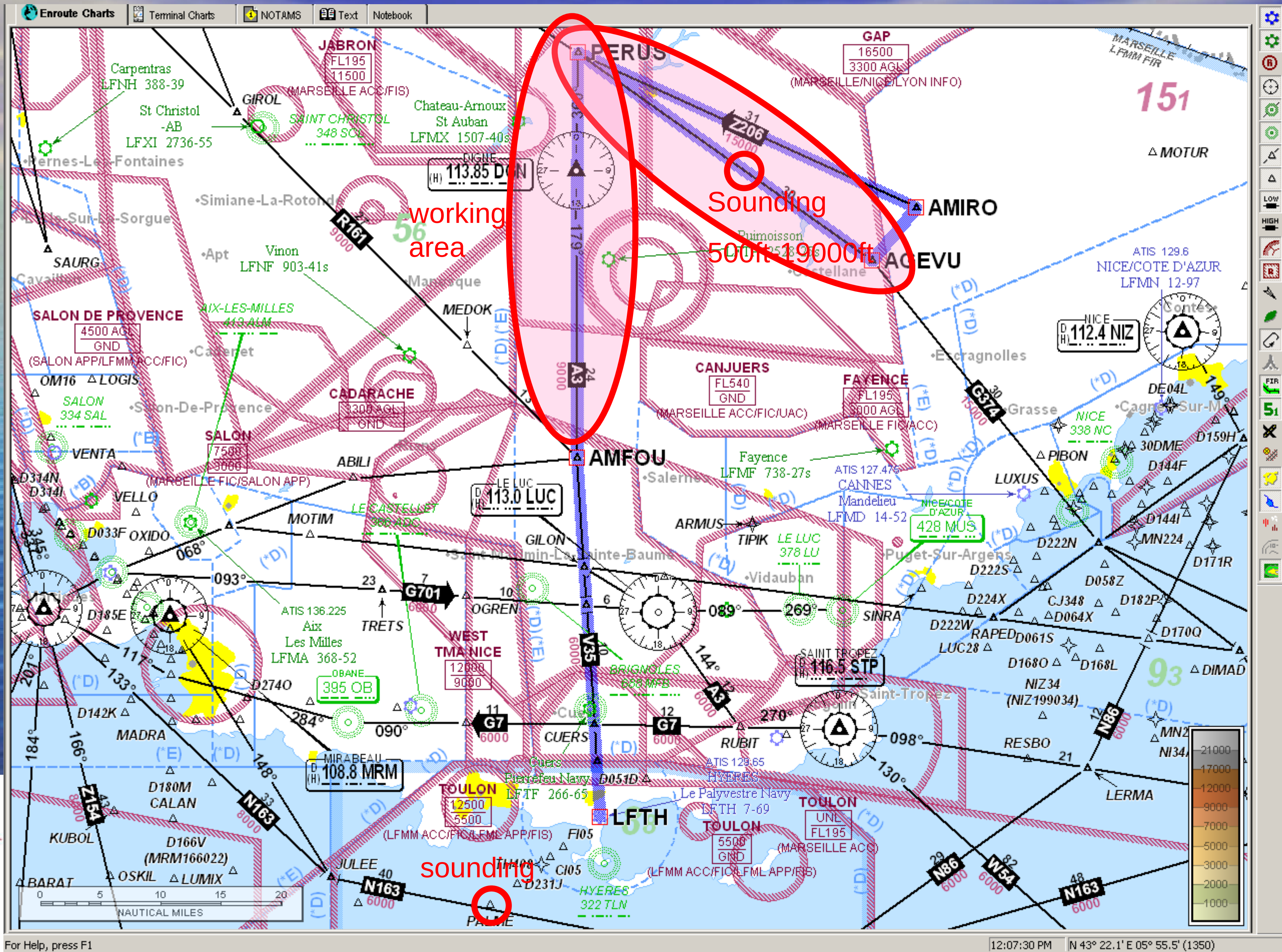
TETRAD-land mission 200Nm



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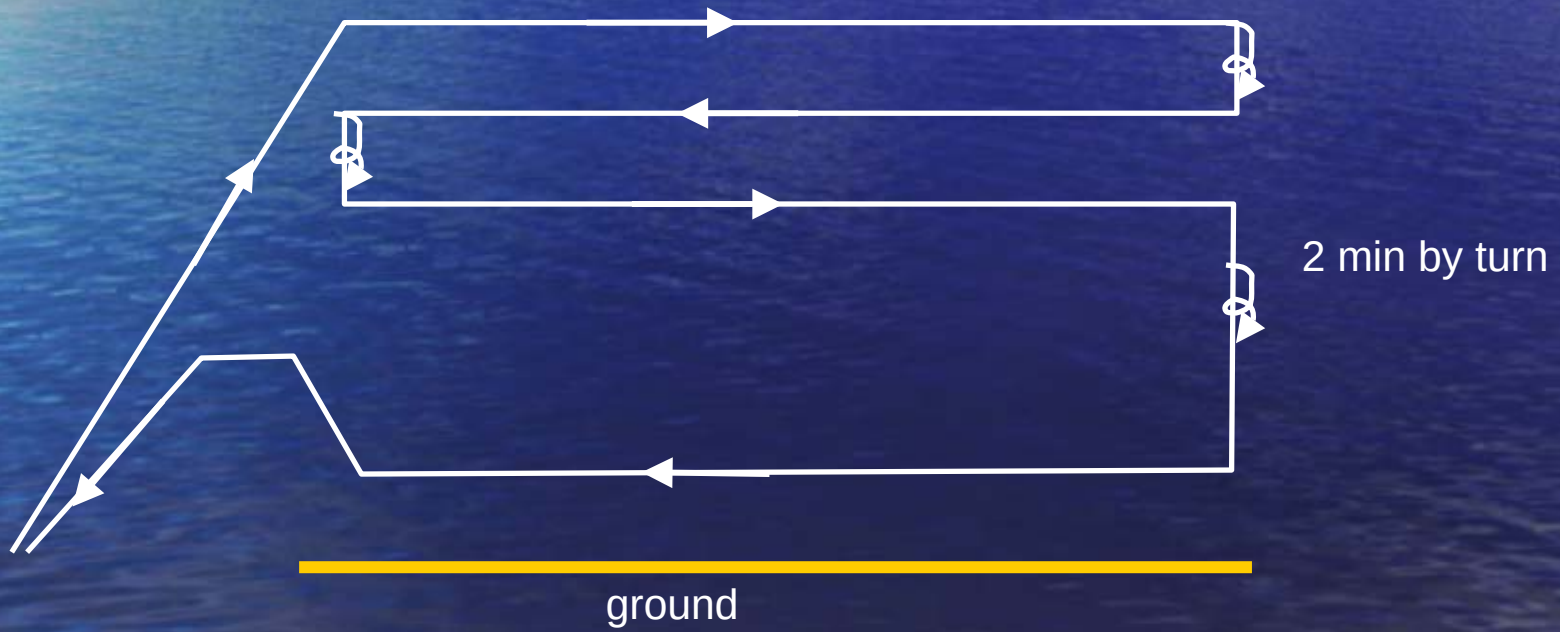
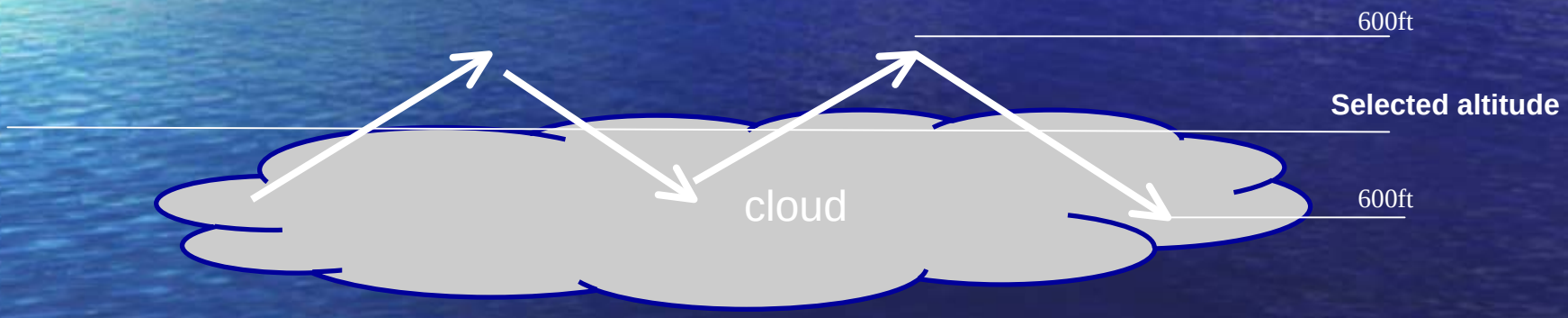
Flight type Flux

- Flux measurements on horizontal legs at different altitudes



Flight type Stratus cloud

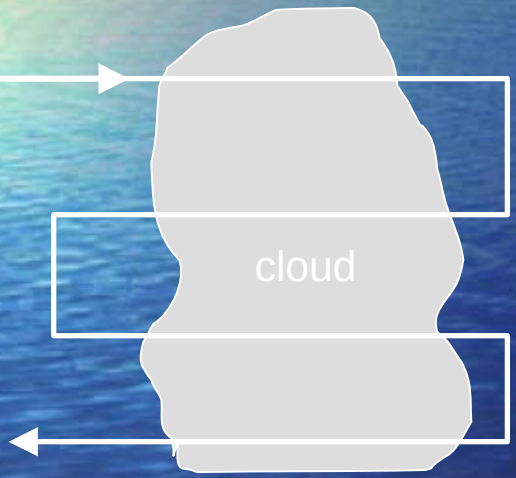
- Up and down in cloud at +/-600ft of the selected altitude. Vertical speed 300ft/mn

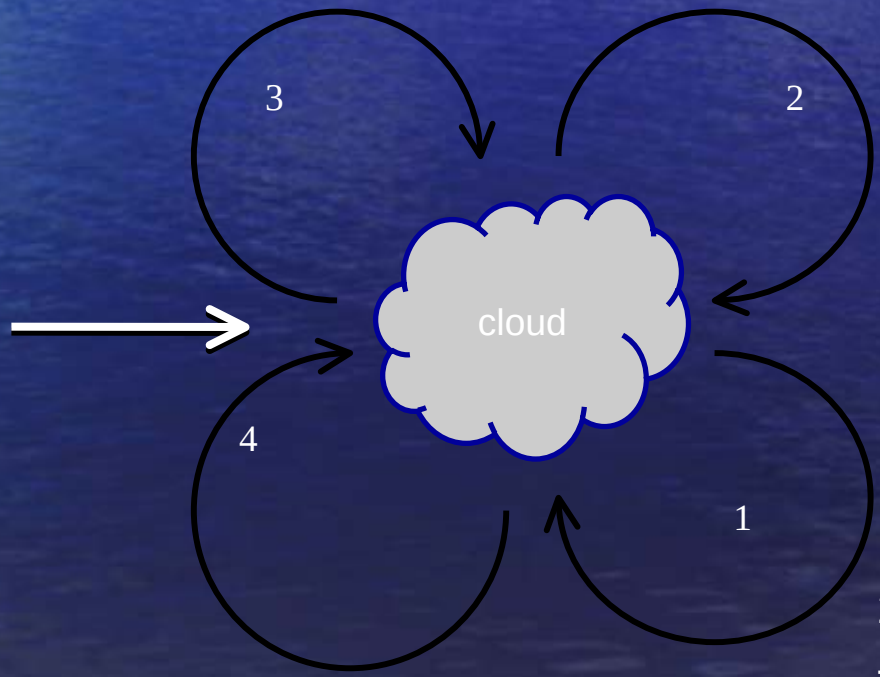


2 min by climb or descent

Flight type Cumulus cloud

- Butterfly pattern at different altitudes





2 min by turn

Total 8min

Limitations

Estimate of the flight duration

- Butterfly pattern 4 levels

Trajectory 200Nm/180kt =	1h06min
Departure/Arrival procedure =	10min
Sounding between 500ft-10000ft =	10min
Butterfly pattern =	32min
3 Level changes by 360° turns =	6min
Total	2h04min