

Infrastructures del Transport Aeri

Mid Term exam - Spring semester 2016

Name:

Short questions: answer them with one word or one sentence in the space provided.
Correct answer: +1 point – Incorrect answer: -1 point – Blank answer: 0 points.

Give **one (1)** example of **safety indicator**

Give **one (1)** example of **efficiency indicator**

Among GNSS, which system **cannot** be used as a **stand-alone** system for navigation purposes?

How is called the European SBAS?

What is the main difference between a NDB and a Locator?

Which system is “newer” and provides better navigation accuracy, a NDB or a VOR?

Give the name of at least three legs of the visual aerodrome traffic pattern?

Give the name of 3 different types of IFR navigation legs

There are three types of fixes, enumerate just **two (2)**

Which are the three main **tasks for any pilot**? Order them from the highest priority to the lowest priority.

Cite **three (3)** different aspects that may influence the design (shape and size) of an ATC sector.

Give **the main reason** why ACC/En-route sectors are typically bigger than TMA ones

Which air traffic control paradigm will typically lead to **smaller** separation minima: procedural or radar control?

Give the main reason why radar control is not provided in oceanic areas

In order to answer the following questions, use the IFR charts provided in annex to this exam:

What is the **minimum flight altitude** for the segment of the airway that goes from Barcelona VOR to SARGO fix (at the North-East border of Palma TMA)?

An aircraft operator is flying from Girona airport to Madrid. The initial part of its IFR route (as filed in the ATS flight plan) has been written as: *CLE – MAMUK – H110 – REBUL – G23 ... Is this ATS flight plan correct?* Answer yes or no. If it is not correct, what would be the correct version?

Does the en-route chart given in annex to this exam correspond to the **Upper airspace or the Lower airspace?**

KABRE1F arrival procedure for runway 19R at Menorca is composed by two IFR legs. What type of **fix** delimits the end of the first leg and the beginning of the second leg?

Using the charts given in annex to this exam, determine the best IFR route going from Girona airport (LEGE) to Menorca airport (LEMH). **Write the route as you would file it in a ATS flight plan.**

Using the charts given in annex to this exam, determine the best IFR route going from Menorca airport (LEMH) to Girona airport (LEGE). **Write the route as you would file it in a ATS flight plan.**

In order to answer the following questions, use the VFR chart provided in annex to this exam:

Imagine a **VFR** flight departing **Laon Ch. (LFAF)** aerodrome (located at the upper right part of the chart) and flying directly to **Montdidier VOR (MTD)** at **4000 ft** (following radial 271 approximately). Please note that this route flies south of Noyon town. What is the **name** of the first airspace block that the pilot must contact compulsorily?

Imagine an **IFR** flight departing **Laon Ch. (LFAF)** aerodrome (located at the upper right part of the chart) and flying directly to **Montdidier VOR (MTD)** at **4000 ft** (following radial 271 approximately). Please note that this route flies south of Noyon town. What is the **name** of the first airspace block that the pilot must contact compulsorily?

A **VFR** flight in PARIS CTR 1 is going to receive separation instructions, flight information or none of the others?

A **VFR** flight in TMA BEAUVRAIS 4 is going to receive separation instructions, flight information or none of the others?

INFRAESTRUCTURES DEL TRANSPORT AERI (ITA)

Mid Term Exam - Spring semester 2015

Correct answer: +1 point – Incorrect answer: -1/3 points – Blank answer: 0 points
For each question **only one answer** is correct

Assignatura 00213 – Centre 300 – Parcial 01 – Permutacio A:0 B:1 C:2 D:3

Use the **right** side numbering to mark your answers into the optical mark recognition sheet
Marking a case of the first answer line selects the answer, marking a case into the second line cancels it

Permutacio A

1. Which of the following sentences is correct?
 - (a) In VMC an aircraft must always fly according to IFR.
 - (b) In IMC an aircraft must always fly according to VFR.
 - (c) In IMC an aircraft can fly according to IFR or VFR.
 - (d) In VMC an aircraft can fly according to IFR or VFR.
2. In a NDB approach procedure, the decision to land or to execute a missed approach must be taken, at the latest...
 - (a) when reaching the OCA.
 - (b) when reaching the MDA.
 - (c) when reaching the MAPt.
 - (d) when reaching the DA.
3. Regarding transition level/altitude, which is the correct statement?
 - (a) When descending, pilots must change the altimeter setting from STD to QNH at the specific transition altitude.
 - (b) When climbing, pilots must change the altimeter setting from STD to QNH.
 - (c) None of the other answers are correct.
 - (d) STD = QNH if and only if pressure at sea level equals to 1013.25 hPa at the specific region/airport.
4. Using GPS, own-ship position can be determined...
 - (a) by means of the Doppler effect.
 - (b) None of the other answers are correct.
 - (c) by measuring the distance to the satellites, whose positions are known.
 - (d) by measuring the relative velocity to the satellites, whose velocity vectors are known.
5. Which of the following statements is correct?
 - (a) A NPA approach is always a VOR procedure (*).
 - (b) None of the other answers are correct.
 - (c) The answers marked with (*) are correct.
 - (d) A VOR approach is always a NPA procedure (*).
6. A small aircraft, flying in VFR wants to fly from *Peronne (LFAG)* to *Soissons (LFJS)* following a straight line. Check the VFR chart provided in annex to this exam. You will find these two aerodromes at the upper right part of the chart. Which of the following answers is correct?
 - (a) This flight can allways be done, providing the aircraft is equipped with a VHF radio.
 - (b) This flight can only be done if the altitude is kept below FL55 ft.
7. Which of the following is a clear objective of the air traffic control (ATC) service?
 - (a) the two answers labeled with (*) are correct.
 - (b) To expedite and maintain an orderly flow of air traffic (*).
 - (c) To provide advice and information useful for the safe and efficient conduct of flights.
 - (d) To prevent collisions between aircraft (*).
8. An ILS approach is generally a:
 - (a) Straight-in approach and a precision approach.
 - (b) Straight-in approach and a non precision approach.
 - (c) Circling to approach and a precision approach.
 - (d) Circling to approach and a non precision approach.
9. How do ATC collaterals coordinate for exchanging information?
 - (a) Ground/Air communication: VHF band.
 - (b) Dedicated voice/data links.
 - (c) Dedicated VHF channels.
 - (d) Ground/Air communication: HF band.
10. Which is the correct order of these types of airspace/areas if we sort them **from non segregated to fully segregated**? (TSA: temporary segregated area; RCA: reduced coordination airspace; TRA: temporary reserved area; PCA: prior coordination airspace)
 - (a) TSA, RCA, TRA, PCA.
 - (b) RCA, PCA, TRA, TSA.
 - (c) TRA, TSA, RCA, PCA.
 - (d) PCA, RCA, TSA, TRA.
11. Which of the following communication systems / airbands can be used in oceanic areas?
 - (a) VHF.
 - (b) None of the answers are correct.
 - (c) UHF.
 - (d) HF.
12. What does *broadcast* mean, in the context of ADS-B?
 - (a) that all ADS-B messages are automatically stored in a database.
 - (b) that the ADS-B messages are automatically computed without the active action of the pilot.
 - (c) that the ADS-B messages are continuously requested by ground ATC facilities.

- (d) that the ADS-B messages are continuously transmitted.
13. Who is responsible to publish a contingency instrumental departure for a given runway?
- The national safety agency.
 - the aircraft operator.
 - the aircraft manufacturer.
 - the ANSP.
14. Regarding the SID MAMUK1H for RWY20 at Girona airport, which of the following statements is correct?
- All aircraft shall be at FL75 or above when overflying MAMUK.
 - All aircraft shall be at FL75 when overflying MAMUK.
 - All aircraft shall be at FL75 or below when overflying MAMUK.
 - All aircraft shall be at strictly below FL75 when overflying MAMUK.
15. Regarding Figure 1, what does the point *Echo* (E) in the chart indicate?
- an NDB.
 - a visual reference point for the departure procedure.
 - a VOR.
 - a visual reference point for the arrival procedure.
16. One of the advantages of performing continuous climb operations is that:
- all the answers are correct.
 - the capacity of departures at the airport is increased.
 - the conflicts with other traffic are reduced.
 - the environmental impact of the operations is reduced.
17. Which transponder mode transmits only the transponder code of the aircraft?
- Mode S.
 - Mode B.
 - Mode C.
 - Mode A.
18. Which of the following emergency ATS phases is the first one to be activated?
- Detresfa
 - Incerfa
 - Palerfa
 - Alerfa
19. In civil aviation, which of the following transponder modes corresponds to the simplest system?
- Mode A.
 - Mode B.
 - Mode C.
 - Mode S.
20. ISA conditions are used in the model used in your WP1 project. In this case, the difference between the pressure altitude and the real altitude is:
- 0 m (0 ft).
 - 4 m (14 ft) because this is the elevation of the origin airport.
- (c) the difference between pressure altitude and real altitude increases with altitude.
- (d) it depends on the altimeter performance.
21. Visual approaches with prescribed tracks...
- do not longer exist nowadays.
 - are only published for VFR flights.
 - are typically used in the US (even at major airports) and for some circling-to-approach procedures.
 - are only used as contingency procedures and must be designed by the operator of the aircraft.
22. Regarding the airspace opening scheme:
- It defines at what time the airspace will be available for civil traffic.
 - It defines how sectors are collapsed. During the entire day, the sector configuration does not change.
 - It defines how sectors are collapsed. The sector configuration actually may change during the day.
 - None of the other answers are correct.
23. According to Figure 1...
- Turns in the airfield traffic pattern are to the right for runway 31 and to the left for runway 13.
 - Turns in the airfield traffic pattern are always to the right.
 - Turns in the airfield traffic pattern are to the left for runway 31 and to the right for runway 13.
 - Turns in the airfield traffic pattern are always to the left.
24. What is a TRA (temporary reserved area)?
- a volume of airspace temporary reserved and allocated for specific use where civil traffic might transit under an ATC clearance.
 - a volume of airspace temporary reserved and allocated for specific use where civil traffic cannot transit under any circumstance.
 - a volume of airspace temporary reserved for IFR terminal maneuvers where VFR traffic cannot transit under any circumstance
 - a volume of airspace temporary reserved for IFR terminal maneuvers where VFR traffic might transit under an ATC clearance
25. Regarding the Satellite Based Augmentation System (SBAS)...
- Such systems are commonly composed of multiple ground stations, located at accurately-surveyed points.
 - It is a system that supports a wide-area or regional augmentation by using several additional satellite broadcast messages.
 - All the answers are correct.
 - The ground stations take measurements of one or more GNSS satellite signals and other environmental factors which may impact the signal received by the users.
26. Which is the main problem of current version of GPS if used for civil aviation?
- Its lack of availability.
 - Not enough vertical accuracy for en-route procedures.
 - Not enough accuracy for terminal procedures.
 - Its lack of integrity.

27. When an aircraft is performing a CCO with the maximum angle of ascent speed, we can affirm that:
- the velocity changes because some aircraft parameters and the altitude are changing.
 - the velocity of the aircraft is constant.
 - the velocity changes because it only depends on the altitude.
 - the cruise altitude will be achieved faster than using the maximum rate of climb speed.
28. What is the international radiotelephony **urgency** signal for aviation?
- The word *Pan-Pan* repeated three times.
 - The word *MayDay* repeated three times.
 - The word *Pan-Pan*.
 - The word *MayDay*.
29. A VFR flight is flying inside an airspace of class D. The air traffic controller is responsible to separate it from:
- the controller has no separation responsibility with VFR flights in airspace class D.
 - other VFR and IFR flights.
 - other IFR flights.
 - other VFR flights.
30. Which of the following airspace volume is, in general, the biggest one?
- CTR.
 - ATZ.
 - TMA.
 - ATC.
31. Which of the following statements is *not correct*?
- when reaching the MDA, if the aircraft crew cannot see the landing runway they must immediately initiate the missed approach procedure.
 - for the same airport, the MDA for a circling to approach procedure would be typically higher than the MDA for an straight-in approach procedure.
 - when reaching the MAPt, if the aircraft crew cannot see the landing runway they must immediately initiate the missed approach procedure.
 - when reaching the DA, if the aircraft crew cannot see the landing runway they must immediately initiate the missed approach procedure.
32. What is the most important characteristic of controlled airspace?
- all answers are equally important and all them characterize controlled airspaces.
 - aircraft must be equipped with a transponder to enter.
 - separation services are always provided.
 - aircraft need a clearance to enter.
33. Consider the VFR chart of the Paris area provided in annex to this exam. The airspace class E over the aerodrome *La Ferte Gaucher (LFFG)* (lower right part of the chart)...
- goes from ground level to 3500 ft.
 - goes from 3500 ft to FL45.
 - goes from FL55 to the upper airspace.
 - goes from FL45 to the upper airspace.
34. In a Localizer only approach procedure, the decision to land or to execute a missed approach must be taken, at the latest...
- when reaching the MDA.
 - when reaching the MAPt.
 - when reaching the DA.
 - when reaching the OCA.
35. Regarding ATS sector sizes, which is the correct statement?
- All the other answers are correct.
 - Bigger sectors usually deal with less traffic.
 - Smaller sectors are more often used in TMA.
 - Sector size depends on traffic complexity.
36. In which of the following airspace classes VFR flights are not allowed?
- in airspace class G.
 - in airspace class E.
 - in airspace class A.
 - VFR flights are allowed in all airspace classes, providing that they are conveniently equipped with VHF radio equipment and secondary radar transponder if so required.
37. What is a VOLMET?
- A special message issued by the International Volcanic Meteorology Office, regarding volcanic activity.
 - A radio station broadcasting meteorological information of a specific airport, indicating as well, the runway in service, the preferred IFR approach, the transition level and any other relevant information regarding airport operations.
 - A radio station broadcasting meteorological information of a certain area, including some relevant airports.
 - A radio station broadcasting volcanic activity information in a certain area.
38. Which services are encompassed in ATS?
- None of the other answer are correct.
 - Air traffic control and flight information service (both depending on the airspace class) and alert service.
 - Flight information service, alert service and air traffic control, regardless the airspace class.
 - Flight information service and alert service regardless the airspace class.
39. The MDA...
- is the altitude that once reached the pilot must decide whether to continue or abort a non-precision approach.
 - is the minimum altitude for circling approaches, while the DA is the minimum altitude for straight-in approaches.
 - None of the other answers are correct.
 - is the minimum altitude to overfly the runway threshold, just before landing.
40. In what situation the effect of the wind will have a bigger impact on the actual trajectory flown by an aircraft?
- when the aircraft is following a given NDB course.
 - when the aircraft is following a given VOR radial.
 - when the aircraft is following a given track.
 - when the aircraft is following a given heading.

41. The goal of the Air Navigation Services (ANS) is to improve one or more of the following indicators at the same time none of the remaining ones are degraded:
- Safety and security.
 - Safety and traffic.
 - Safety, security and predictability.
 - Safety, capacity and efficiency.
42. In the model used in your WP1 project, how do you simulate the flaps/slats configuration?
- changing the wing surface.
 - the flaps/slats configuration is not simulated in the WP1.
 - changing the CD0 and CD2 parameters of the drag coefficient.
 - changing the CT1, CT2 and CT3 parameters of the Thrust expression.
43. Consider the VFR chart of the Paris area provided in annex to this exam. The airspace class over the town of *Nanteuil le Haudouin* (North-East of Paris Charles de Gaulle airport) at 3000 ft is:
- Class A.
 - Class D.
 - Class G.
 - Class E.
44. Which of the following institutions is NOT an air navigation service provider (ANSP)?
- NATS.
 - ENAV.
 - EASA.
 - ENAIRE.
45. Who is responsible to detect and solve short term conflicts within an ATC sector?
- The strategic controller
 - The tactical controller.
 - The ATC supervisor.
 - The approach controller.
46. Regarding the legs that compose the GEANT1H SID for RWY20 at Girona airport, which of the following options is correct?
- The SID is formed by one VOR radial, followed by a dead-reckoning leg, followed by another VOR radial.
 - The SID is formed by the succession of three consecutive VOR radials.
 - The SID is formed by a VOR radial, followed by a DME arc, followed by two VOR radials.
 - The SID is formed by a dead-reckoning leg, followed by a DME arc, followed by two VOR radials.
47. Consider the VFR chart of the Paris area provided in annex to this exam. The airspace class over the town of *Chauny* (upper right part of the chart) at FL60 ft is:
- Class A.
 - Class E.
 - Class D.
 - Class G.
48. The direction, with respect to the North, that join two way-points (or fixes), is called...
- heading.
 - course.
 - track.
 - bearing.
49. Regarding future concepts in airspace management, which of the following statements is correct?
- The USA have similar problems as Europe regarding the airspace sovereignty and sectorisation issues.
 - The flexible use of airspace (FUA) initiative aims at designing airspace sectors regardless State boundaries.
 - A functional airspace block (FAB) is as an airspace block based on operational requirements and established regardless of State boundaries.
 - Europe does not need further airspace initiatives as airspace sovereignty is fully delegated to the European Union.
50. In what situation an approach procedure cannot be a straight-in approach?
- when the angular difference between the final track alignment and the runway track exceeds a given value*
 - both answers marked with a (*) are correct.
 - when the final descent gradient exceeds a given value*
 - in case the procedure is a non-precision approach.
51. Imagine a ground ATC system equipped only with a SSR mode C radar. Which of the following statements is correct?
- Aircraft calibrated airspeed can be inferred from radar data.
 - Aircraft true airspeed can be inferred from radar data.
 - Only aircraft squawk code and altitude are received from radar data.
 - Only aircraft ADS-B messages can be received from radar data.
52. Regarding the flexible use of airspace (FUA) concept, the third level (tactical level) deals with:
- The definition of the sectorisation and capacity of the military airways.
 - The real-time use and management of available airspace.
 - The day-to-day allocation of airspace, according to users requirements.
 - The definition of national airspace policy and predetermined airspace structures.
53. Which of the following statements is NOT a new concept/system regarding the **communications** in the future CNS systems for ATM?
- Aircraft Communications Addressing and Reporting System (ACARS).
 - Reduced VHF frequency spacing (8.33 kHz).
 - Transponder Mode-S.
 - Controller-Pilot DataLink Communications (CPDLC).
54. Regarding the legs that compose the BGR3H SID for RWY20 at Girona airport, which of the following options is correct?
- The SID is formed by a dead-reckoning leg, followed by a DME arc, followed by a VOR radial.
 - The SID is formed by the succession of three consecutive VOR radials.

- (c) The SID is formed by a VOR radial, followed by a DME arc, followed by a VOR radial.
- (d) The SID is formed by one VOR radial, followed by a dead-reckoning leg, followed by another VOR radial.
55. Which of the following statements is correct?
- While accuracy is the proximity of measurement results to the true value, precision is a measure of the repeatability or reproducibility of the measurement.
 - The precision is defined as the probability that the accuracy requirement will be supported by the navigation system throughout a flight operation or flight hour.
 - The accuracy is defined as the probability that the precision requirement will be supported by the navigation system throughout a flight operation or flight hour.
 - While precision is the proximity of measurement results to the true value, accuracy is a measure of the repeatability or reproducibility of the measurement.
56. In the model used in your WP1 project, the Thrust of the aircraft varied as a function of:
- the altitude.
 - the thrust does not change, it is constant.
 - the speed of the aircraft.
 - the drag coefficient.
57. Air Traffic Control (ATC) services shall be provided to:
- All flights that have filed a flight plan.
 - All IFR flights in airspace classes A, B, C, D and E.
 - All IFR flights.
 - Any aircraft known by the ATC.

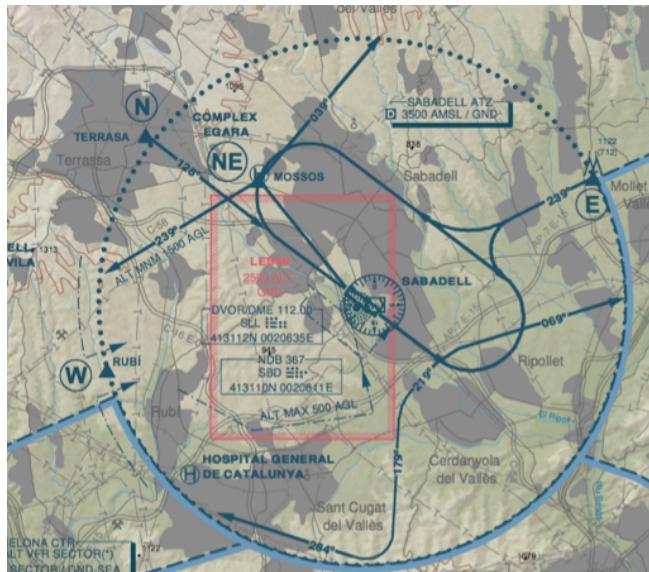
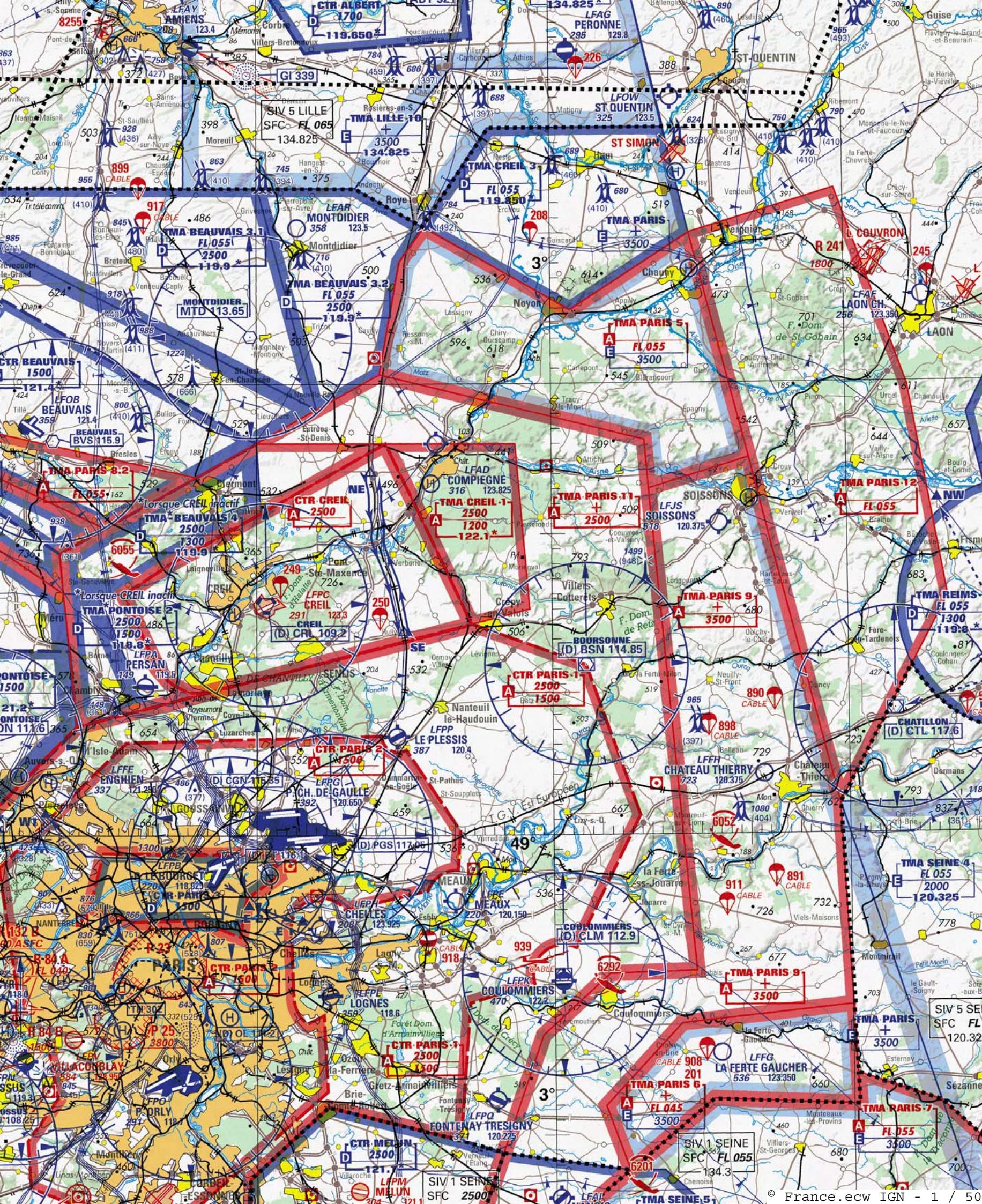
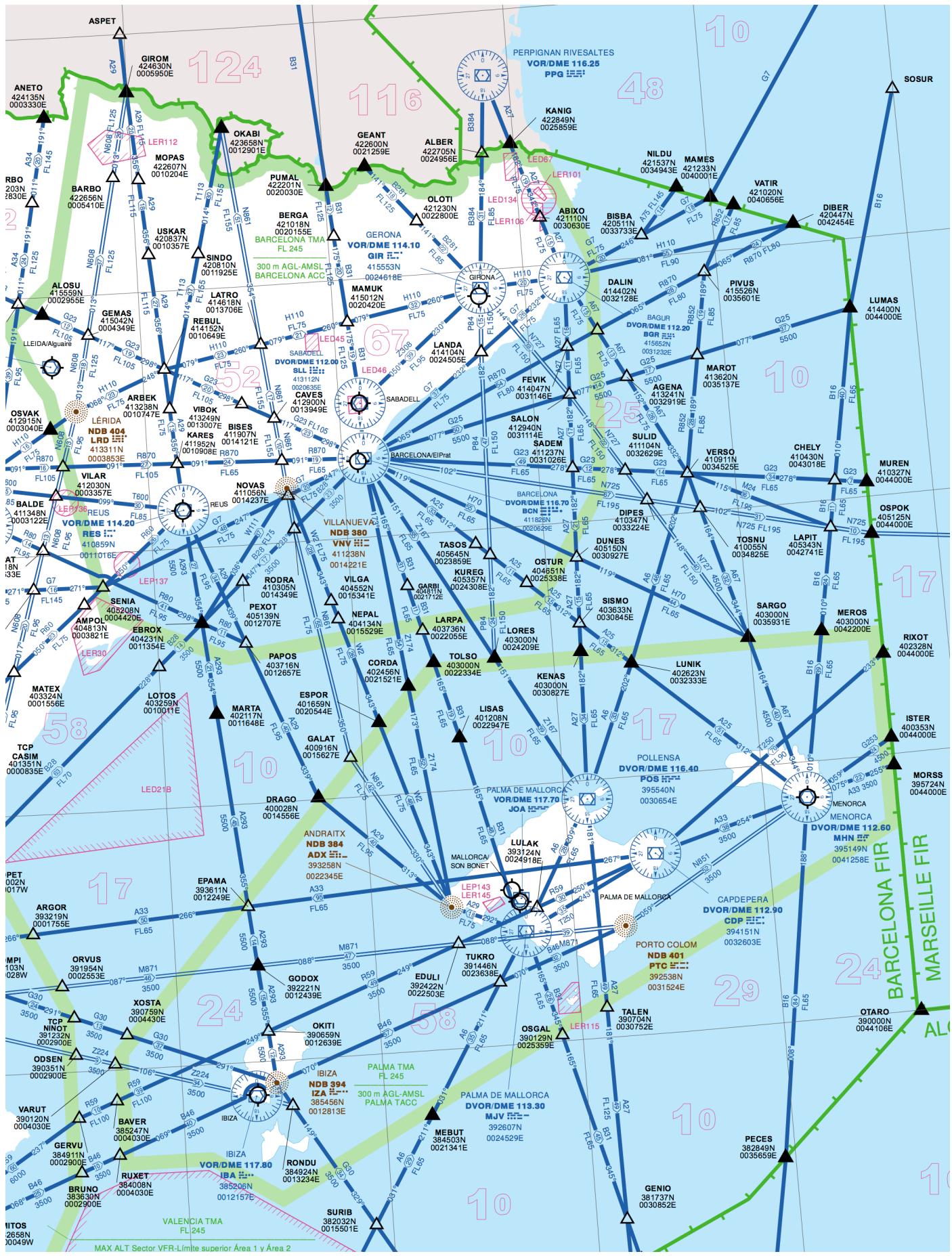
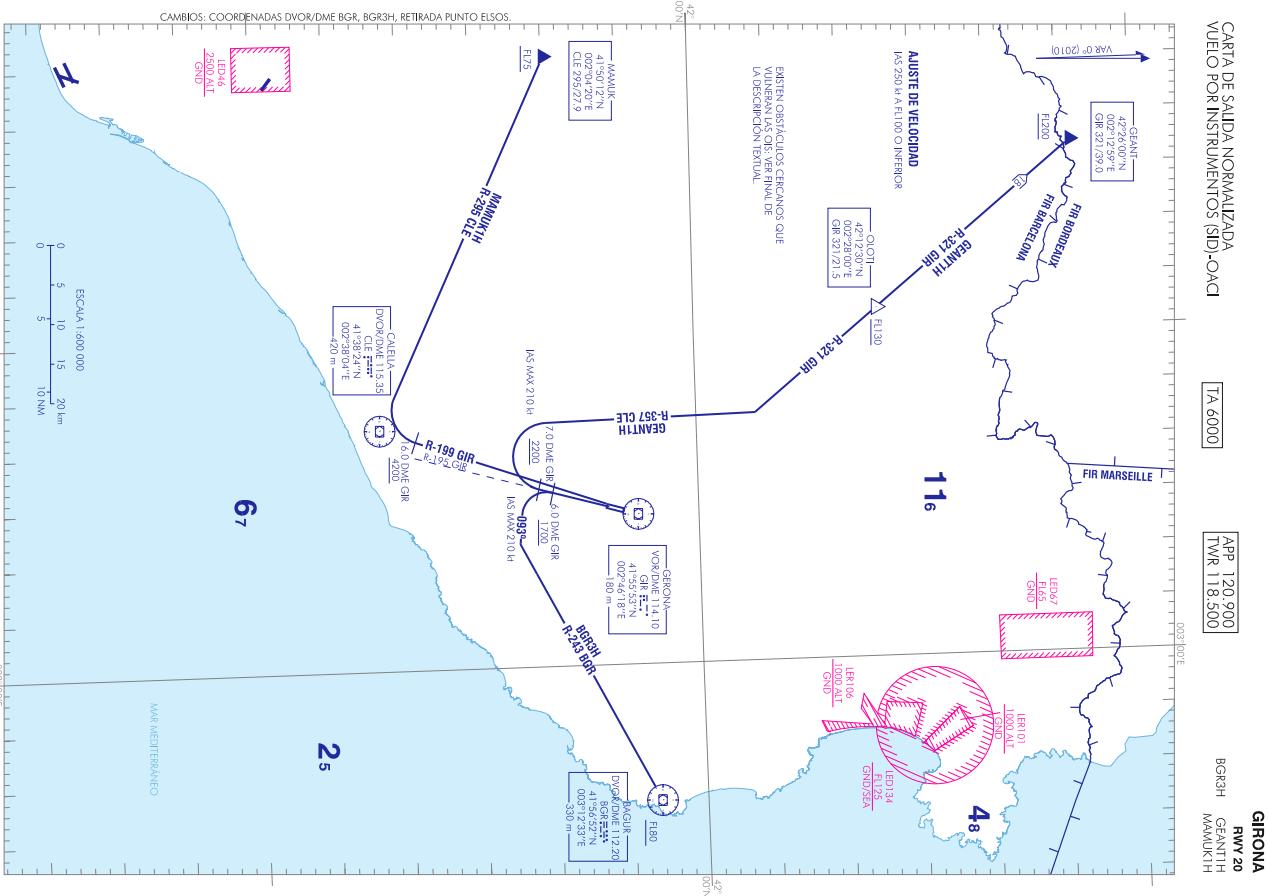
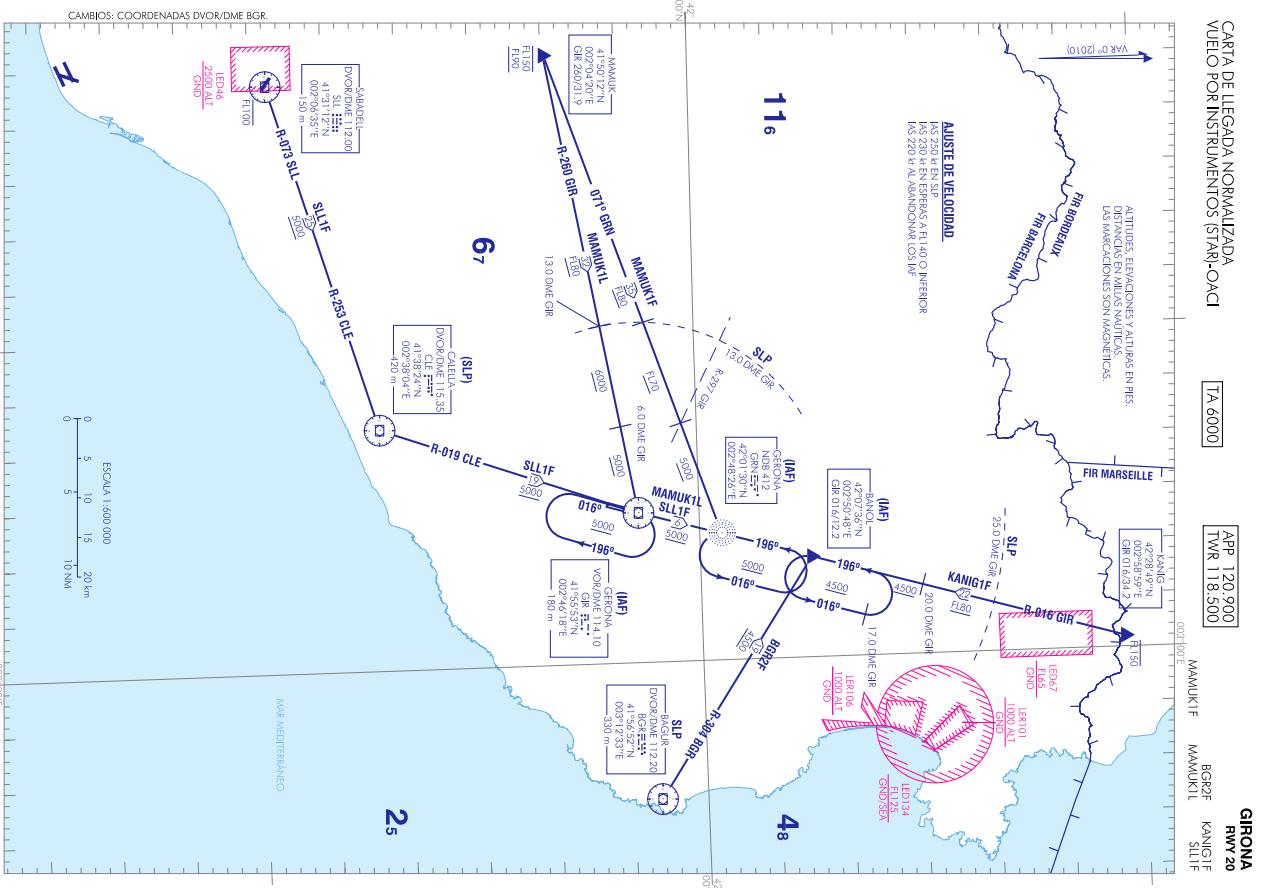
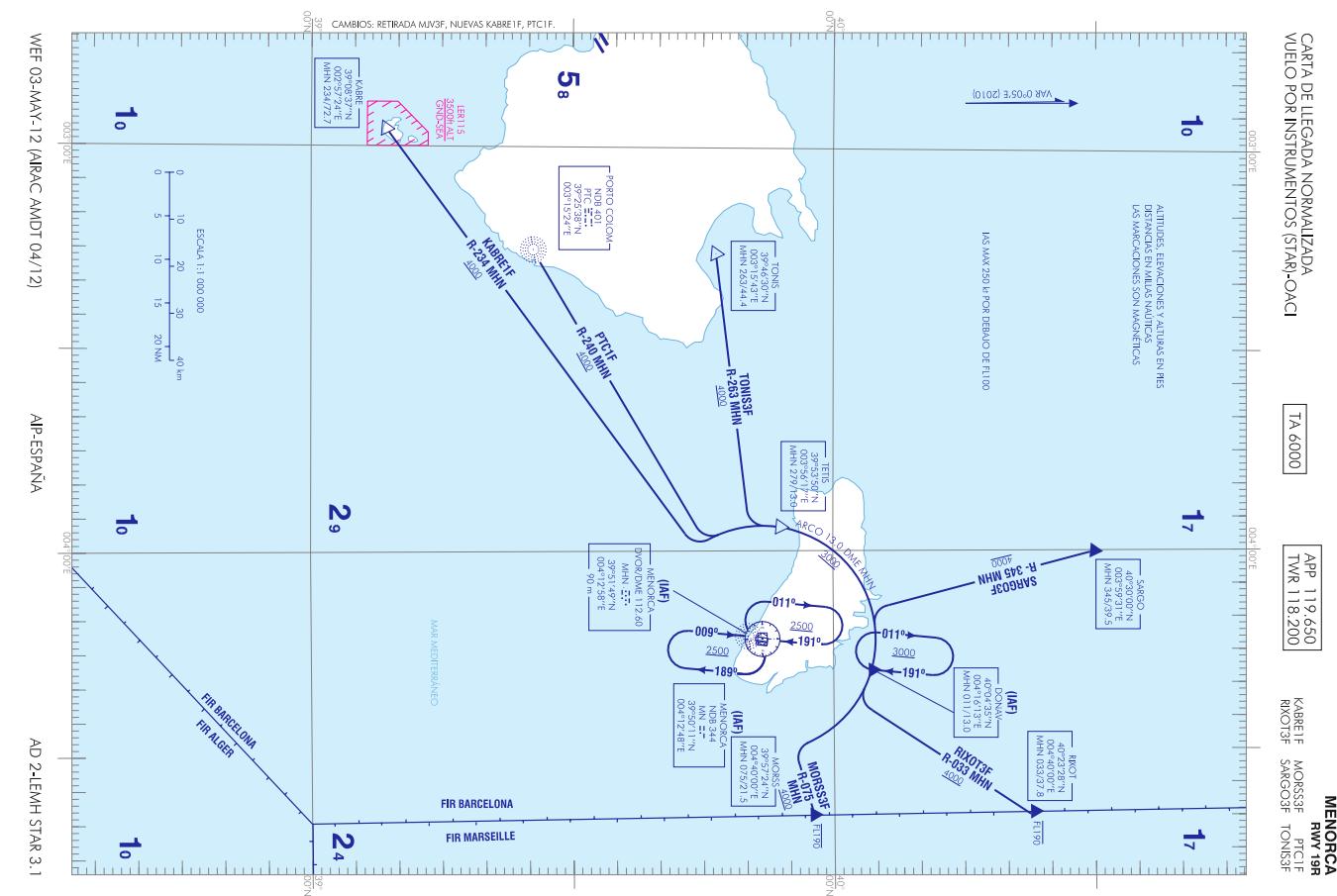
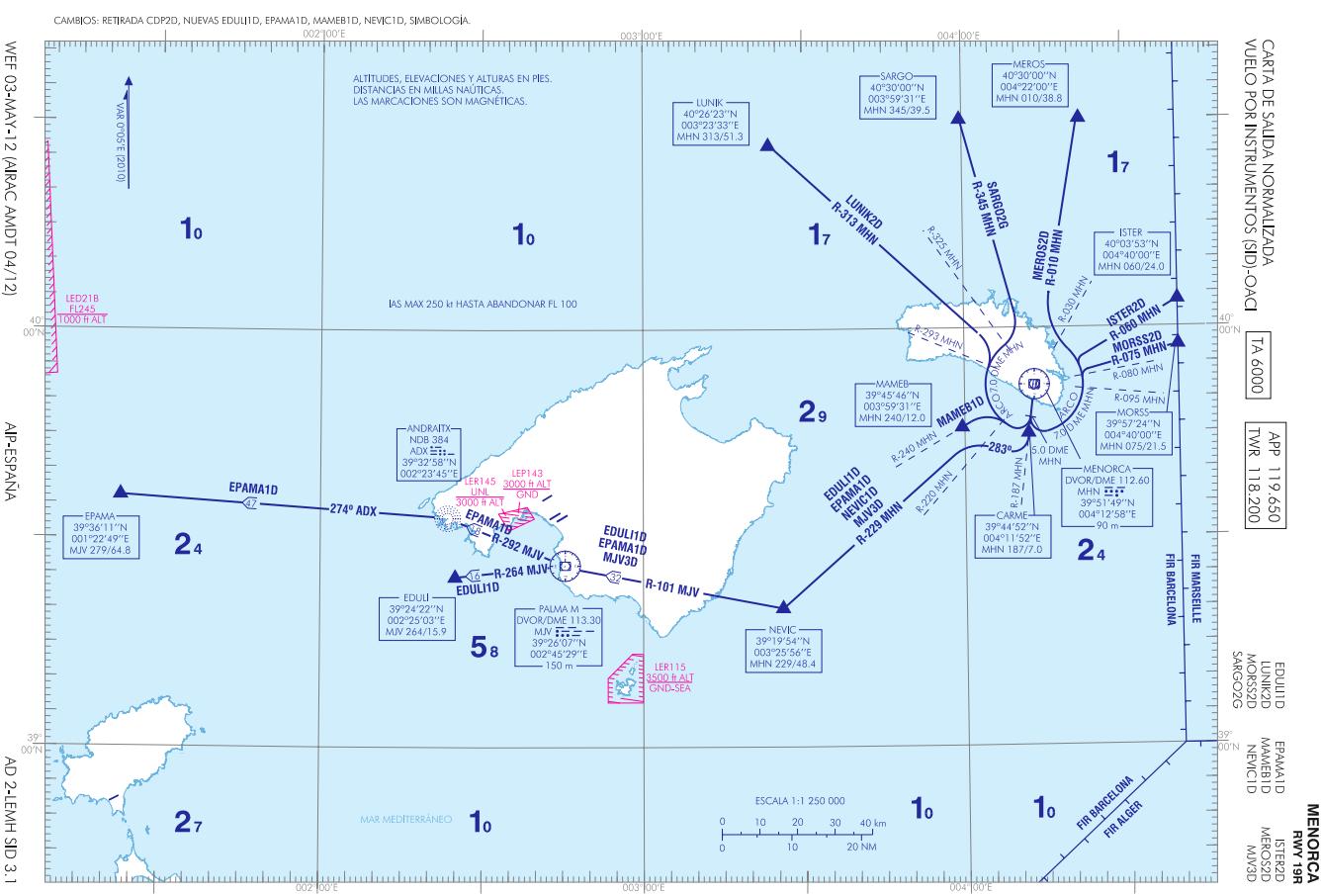


Figure 1: Airfield traffic pattern









INFRAESTRUCTURES DEL TRANSPORT AERI (ITA)

Mid Term Exam - Spring semester 2016

Correct answers

Pregunta	PERM. A	PERM. B	PERM. C	PERM. D
P 01	d	c	c	d
P 02	c	d	a	c
P 03	d	c	c	d
P 04	c	d	d	d
P 05	d	d	d	c
P 06	c	d	a	b
P 07	a	a	d	d
P 08	a	d	a	b
P 09	b	a	b	d
P 10	b	d	d	c
P 11	d	d	c	a
P 12	d	d	b	c
P 13	b	a	a	a
P 14	a	d	b	c
P 15	d	c	c	a
P 16	d	a	d	b
P 17	d	a	d	b
P 18	b	b	a	b
P 19	a	d	b	c
P 20	a	b	c	c
P 21	c	a	c	c
P 22	c	b	c	a
P 23	a	a	b	b
P 24	a	b	d	d
P 25	c	b	a	a
P 26	d	a	c	d
P 27	a	c	b	b
P 28	a	a	b	d
P 29	a	a	c	d
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P 43	a	a	b	d
P 44	c	d	a	b
P 45	b	d	c	a
P 46	b	d	c	c
P 47	a	c	c	a
P 48	b	b	c	d

P 49	c	b	a	a
P 50	b	c	d	d
P 51	c	a	b	d
P 52	b	a	c	a
P 53	c	a	d	d
P 54	d	d	b	a
P 55	a	b	c	a
P 56	a	c	a	c
P 57	b	b	d	d