

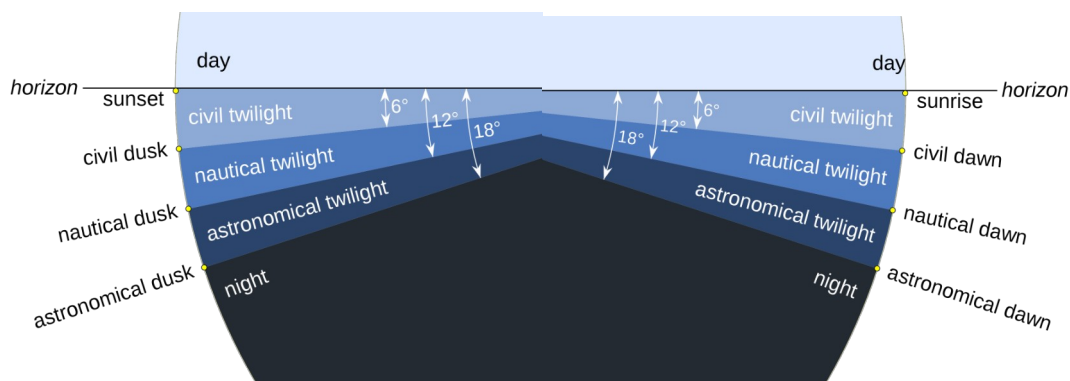
Alien21

Some basics stuffs

Day and night, and UTC time

In this document we will see difference between day and night as reported by ICAO, and we will see how to do communications. Inside aviation world, a day is splitte between daylight and night. As ICAO report:

“Night’ means the period between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise as may be prescribed by the appropriate authority, as defined by the Member State”. This mean that day and night depends from Sun astronomic activity. I will not explain the astronomical definitions, but in consideration that ICAO definition is based on civil sunset/sunrise as you can see from these photo’s:



We can say that daylight start when the Sun is below than 6 degrees below the horizon, and night start when the Sun is located 6 or more degrees below horizon. This value change in for every location and with earth’s inclination to Sun

In addition, aviation use always UTC time instead the local time. To be precise, UTC is a Solar based time; this mean that during Summer Italy will be located under UTC+2 time zone (if UTC will be 12, in Italy will be 14 local) while during winter will be UTC+1.

There is a reason about the use of UTC time in substitution to local time. A day is splitted in 24 hours, this mean that your time is connected to your location. Some flights will fly inside different time zones, so for this reason is better provide ATS services with a unique time system. A solution definetely much better instead use local time for departure and arrival airports.

Comunicazioni

Aviation communications are done mainly with radio. For communications are used MegaHertz frequencies. Radio allow to make half-duplex communications, this mean that A call B and then B can reply to A if required, but is impossible call the other user while he/she's calling us.

In real world, civilian flight use Very High Frequency-VHF communcations, between 30–300 MHz, and High Frequency-HF communications for oceanic or over remote areas, between 3-30 Mhz. Aviation communications range is located between 118.000 Mhz and 136.955 Mhz. With the increasing number of flights, it was necessary adopt a new system for communications. Because VOR and ILS systems use frequencies between 108.000 and 117.950 Mhz, it was possible switch from 25 Khz to 8.33 Khz spacing system.

This table allow use to see how it work this system:

Visible frequency	Real frequency	Spaziatura
127.400	127.4000	25
127.405	127.4000	8.33
127.410	127.4083	8.33
127.415	127.4166	8.33
127.425	127.0250	25
127.430	127.0250	8.33
127.435	127.0333	8.33
127.440	127.0416	8.33
127.450	127.4500	25

You can see from this table that 127.400 and 127.405 use the same real frequency but, on first case the frequenza can be received with the old radio spacing system, while the second is the new 8.33 spacing system. Unlucky flight simulators doesn't simulate this, while in real life this system was implemented from different countries to allow more communications.

When you're online, if there aren't air traffic controllers you must monitor UNICOM frequency, 122.800 Mhz. This frequency must be used especially during takeoff and landings from/into an airport, to report to any other potential aircraft in the area your intention. If there are more controllers, remember the top-down system: a Tower will not provide ATC service to cruise-phase flights, but a CTR can control on ground all controlled airspace classified airports, in addition to all cruise flights inside its airspace.

In real life, frequency 121.500 Mhz is restricted for emergency purposed.

In addition, there is a special frequency, the Automatic Terminal Information Service, or ATIS. This frequency can be used to provide helpful informations about an airport. It can be available also a datalink ATIS sometimes.

ATIS is provided only for 1 airport, it can be update if thers a significant change, and its published from ATS provider responsible for that airport (Control Tower in real life), is marked with a letter identifier from ICAO code which must be report to the ATC when you had receive these informations (ex. if the letter is A, you ATIS Alpha on board), to the Tower if you're departing, to the Approach if you're descending to your destination. It contain also last weather reported. In case a flight doesn't have latest ATIS, ATC must advice that traffic about new informations in use.

ATIS contain:

- Airport name
- if is an ATIS for arrival and/or departure
- communication type if via datalink system
- letter identifier
- time of report
- approach type in use and runways
- significant conditions runways, and breaking action if needed
- possible delays
- transition level
- surface wind and variactions
- visibility and if present, RVR's
- last weather
- clouds below 1500 m (5000ft) or below highest minimum sector altitude, whichever is the highest value
- temperature and dewpoint
- altimeter barometric setting value

- any other significant weather
- windshear
- information about recent weather which affect operations
- reported forecast
- ATIS specific special instructions
- Other essential informations.

Here an example: LIPZ information HOTEL recorded at 1037z
 LIPZ 261020Z 29004KT 9999 FEW070 23/19 Q1008 ARR RWY 04R
 / DEP RWY 04R / TRL FL75 / TA 6000FT Confirm ATIS Info HOTEL
 on initial contact

Only some airports which have a specific flow of traffic have this service. However don't worry, with next tutorial we will analyze more deeply some of these details.

Emergency frequency

Last section of this document is about emergency frequency which I had talked before. In real life, frequency 121.500 Mhz can be used from ATC for emergency communications. There are differences between Pan Pan and an emergency, but in both cases is possible use this frequency. However the use of this frequency is limited only if there is a real necessity: if you're already with radio contact with any Air Traffic Controller, (ATC) isn't required change the frequency, but an aircraft which is flying inside an airspace classified as uncontrolled, can try to use 121.500 frequency if it was unable to communicate with any pilot and ATC on UNICOM for asking emergency support.

There are 2 type of emergencies: distress and urgency

Distress mean that the safety of the flight is compromised and conditions are serious and/or critical which require immediate assistance.

Urgency mean that aircraft condition or the status of one or more passengers which can compromise the safety of the ma senza necessità di assistenza immediata.

In these situation, in addition to declare Mayday o Pan Pan, must be reported, when the ATC can copy these informations: heading and position, level/altitude, aircraft type and person on board, emergency nature, intention and any inability to perform specific flight operations, any other helpful information. Is always a responsibility of the pilot in command evaluate the situation of the flight

Sources

<https://www.easa.europa.eu/sites/default/files/dfu/Annexes%20to%20Regulation.pdf> – Annex 1 DEFINITIONS FOR TERMS USED IN ANNEXES II-VIII

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