

Learning Goals Classifications

Airspace Structures

FIR	Flight information region	A Flight Information Region is an airspace of defined dimensions in which Flight Information Service (FIS) and Alerting Service are provided. In this airspace, Countries are responsible for the provision of the Air Traffic Services (ATS). Very often they match the National boundaries. For practical reasons, countries can delegate part of their airspace to their neighbours.
CTR	Control Zone (Tower)	A CTR is controlled airspace that starts from the surface of the earth upwards to a specified upper limit . Only controlled aerodromes have a CTR.
CTA	Control Area (Center)	A CTA is a Controlled airspace extending upwards from a specified limit above the surface of the earth . It is a box of airspace that does not touch the surface of the earth.
TMA	Terminal Control Area (Approach)	A TMA is a Control Area normally established where airways and/or departure and arrival routes meet in the vicinity of one or more major aerodromes.
AWY	Airway	An AWY is a Control Area or a part of it . It is shaped in the form of a corridor. They have defined upper and lower limits, are usually 10nm wide and are equipped with VORs and NDBs for navigation. The airway name usually starts with a letter followed by number(s). If the route name is preceded by a U , it indicates an Upper Airway.
ATS	Specific route	an airway, a controlled or uncontrolled route, an arrival route, a departure route, etc.
SID	Standard Instrument Departure	An Instrument Flight Rule (IFR) departure route that links an aerodrome or a specified runway of the aerodrome with a specified significant point (normally) on an ATS route . This is mostly the airway at which the en-route phase of a flight begins.
STAR	Standard Instrument Arrival	An Instrument Flight Rule (IFR) arrival route that links a significant point, (normally) on an ATS route, with a point from which a published instrument approach procedure can be commenced.
RNAV	Area Navigation Route	An ATS route (airway, departure route, arrival route, ...) for aircraft that are RNAV equipped to navigate directly from waypoint to waypoint . These routes are mainly defined by intersections, but can also contain VORs & NDBs.
D	Danger Areas	An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times .
R	Restricted Areas	An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions .

P	Prohibited areas	An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited
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Airspace Classifications

Class	Altitude	Type of flight 1)	Separation	Contact ATC	Requires ATC clearance	Speed limit
A	Fl 600 - Fl 200	IFR only	separation from all aircraft	yes	yes	no
B	Fl 100 - GND	IFR	separation from all aircraft	yes	yes	no
		VFR	separation from all aircraft	yes	yes	no
C	4000 ft above apt. elev. - GND	IFR	separation from all aircraft	yes	yes	no
		VFR	separation from IFR but only traffic info about VFR	yes	yes	250 kt IAS below 10.000ft / FL100
D	2500 ft above apt. elev. - GND	IFR	separation from IFR but only traffic info about VFR	yes	yes	250 kt IAS below 10.000ft / FL100
		VFR	traffic info only	yes	yes	250 kt IAS below 10.000ft / FL100
E	Everything outside Class ABCDFG	IFR	separation from IFR only - traffic info about VFR	yes	yes	250 kt IAS below 10.000ft / FL100
		VFR	traffic info only	no	no	250 kt IAS below 10.000ft / FL100
F	3000ft AGL - GND	IFR	separation from IFR only	yes	no	250 kt IAS below 10.000ft / FL100
		VFR	no	no	no	250 kt IAS below 10.000ft / FL100
G	3000ft AGL - GND	IFR	no	yes	no	250 kt IAS below 10.000ft / FL100
		VFR	no	no	no	250 kt IAS below 10.000ft / FL100

1) Maximum flight level VFR FL200

NOTE: Above mentioned Altitudes are general indications and vary from country to country!!!!

for instance check:

<http://www.eurocontrol.int/airspace/gallery/content/public/Classification%20mid%20april%202007.pdf>

Egypt uses Airspace Class A, B and D only



VMC (Visual Meteorological Conditions)

VMC VFR	Flight visibility	Horizontal from clouds	Vertical from clouds 1)
Minimum ICAO Standard 1)	5 km	1500 m	1000 ft
At and above 10.000ft AMSL	8 km	1500 m	1000 ft
Above 3000ft and below 10.000ft AMSL	5 km	1500 m	1000 ft
Below 3000ft AMSL Airspace B-C-D-E	5 km	1500 m	1000 ft
Below 3000ft AMSL Airspace F-G	5 km	Clear of clouds during flight	Clear of clouds during flight Surface in sight (terrain or water)

1) BKN and OVC are considered ceilings. FEW and SCT not

VMC SVFR (Special VFR) 1)

VMC SVFR	Flight visibility	Horizontal from clouds	Vertical from clouds
Minimum ICAO Standard 2)	3 km	Clear of clouds during flight	Clear of clouds during flight Clouds NOT below 600ft Surface in sight (terrain or water)

1) Upon Pilots request ONLY 2) Countries may deviate from ICAO standard !

VFR/SVFR allowed during UDP

(universal daylight period: sunrise+1hr / sunset -1hr)

VMC NVFR (Night VFR)

VMC NVFR	Flight visibility	Horizontal from clouds	Vertical from clouds
Minimum ICAO Standard 2)	5 km	Clear of clouds during flight	Clear of clouds during flight Clouds NOT below 1500ft Surface in sight (terrain or water)

NVFR allowed during sunrise-30min / sunset+ 30min

extra considerations: Requires NVFR rating and extra METEO care / extra insurance / airfield with lighting / aircraft with NAV lights and strobes, X-ponder and COMM. / extra caution with precipitation... rain on windshield will multiply lights on ground and approach which makes visual navigation very difficult. / Clear nights with moonlight adds to visibility on ground...no moonlight prevents seeing rivers/ above FL050 between 22h00LT and 04h59LT / Clear visual flightplan in case NAVaids or instruments fail. p.s. there is no such thing as SNVFR (special night VFR)



VFR Communication

Startup	Enter FIS	Cross CTR	Enter CTR
Callsign	Callsign	Callsign	Callsign
Aircraft type	Aircraft type	Aircraft type	Aircraft type
Position	Position	Position	Position
	altitude		altitude
Rules (IFR/VFR)	Rules (IFR/VFR)	Rules (IFR/VFR)	Rules (IFR/VFR)
Destination or intention	Departure + Destination or intention	-	-
ATIS letter	-	-	ATIS letter
-	-	-	-
-	-	-	-
Request startup	-	Request crossing (route)	Request Full stop/touch and go
	-	altitude	
	ETA		

Aircraft Classification

Aircraft categories	MTOW (kg)		Examples
L	7000 or less		C172 - C182 - TB20 - C208
M	7001 - 136000		B737 - A320 - B717 - FA50 - B757 - CRJ7 - C120 - LR45
H	more than 13600		B 747 - MD11 - B777 - A225 - A340 - DC10 - A330 - L101

Aircraft categories	Vref (KIAS)	Initial App speed (KIAS)	Examples
A	less than 90	90-150	All helicopters - DHC6 - PA28 - C172 - C182 - TB20 - C208
B	90-120	120-170	B190 - E120 - AT42 - SF34 - AT72 - B350 - M20T - DHC8
C	121-140	160-220	B737 - A320 - B717 - FA50 - B757 - CRJ7 - C120 - LR45
D	141-165	182-220	B 747 - MD11 - B777 - A225 - A340 - DC10 - A330 - L101
E	166-210	185-220	CON

$V_{ref} = V_{at} = 1.3 * V_{so}$ (Vso is the Stalling speed with gear and flaps out)



Aircraft Speeds

They are mainly indicated airspeeds (IAS) used in a specific relations.

a) TAKE-OFF :

V1 = take-off decision speed (or critical speed). Before V1, the pilot can abort take-off. After V1, the pilot MUST take off.

VR = take-off rotation speed at which the pilot gently pulls the flight controls to rise the nose and take off.

V2 = take-off safety speed to be reached before passing 35 ft above runway altitude.

b) CRUISE :

Va = Maneuvering speed, max speed at which flight controls can be fully maneuvered.

Vno = Normal Operation speed, max cruise speed.

Vne = Never Exceed speed.

Vmo = Maximum Operating speed (KIAS).

Mmo = Maximum Operating Speed (Mach).

c) APPROACH AND LANDING :

Vfe = Maximum speed with Flaps Extended.

Vlo = Maximum speed for Landing gear Operations (retraction and extension).

Vle = Maximum speed when Landing gear Extended.

Vs = Stalling speed (at max weight).

Vso = Stalling speed with gear and flaps Out (at max weight).

Vref = Reference speed (or landing speed) = $1.3 \times Vso$ (Vref also known as Vat).

d) APPROACH REGULATION :

Minimum clean speed = minimum speed with gear/flaps/slats up and airbrakes in, usually about $1.5 \times Vso$.

Minimum approach speed = Vref (see above), $1.3 \times Vso$.

Approach Classification

Approach Segments:

- 1- STAR
- 2- Initial Approach (IAF)
- 3- Intermediate Approach (IF)
- 4- Final Approach (FAF)
- 5- Missed Approach

Precision Approach:

ILS with DH/DA and RVR

Category	DH (ft)	RVR (m)
Cat I	200 or more	550 or more
Cat II	100 - 199	300-549 cat: A, B, C 350-549 cat D 1)
Cat IIIa	less than 100	200-399
Cat IIIb	less than 50	less than 200
Cat IIIc	no spec value	no spec value

1) Appendix 1 to JAR-OPS 1.430, Table 6, permits the use of an RVR of 300m for Category D aircraft conducting an autoland



Non-Precision Approach:

VOR, VORTAC, NDB, LLZ, ILS with GS out.

a. All non-precision approaches will be reviewed to show CDFA (Continuous Descent Final Approach) profile and minimums.

b. In case of CDFA only, a DA(H) is shown instead of the previously published MDA(H). The missed approach point is still shown according to state source but the missed approach initiation arrow is moved to the point where the DA(H) is reached.

Visual Reference: (at least 1 element)

	Below DA / DH					Below MDA / MDH
	CAT I	CAT II	CAT IIIA	CAT IIIB	CAT IIIC	NON prec.APP
Elements of the approach light system	X	-	-	-	-	X
The threshold	X	-	-	-	-	X
The threshold markings	X	-	-	-	-	X
The threshold lights	X	-	-	-	-	X
The threshold identification lights	X	-	-	-	-	X
The visual glide slope indicator	X	-	-	-	-	X
The touchdown zone or touchdown zone markings	X	-	-	-	-	X
The touchdown zone lights	X	X	X	-	-	X
Runway edge lights	X	X	X	-	-	X
Other references accepted by the Authority	X	-	-	-	-	X
at least 3 consecutive lights being the centre line of the approach lights	-	X	X	-	-	-
Runway centre line lights	-	X	X	-	-	-
Lateral reference	-	X	-	-	-	-
No DH needed RVR 75m	-	-	-	X	-	-
No reference needed	-	-	-	-	X	-



Holding Classification (ICAO)

Levels (1)	Timing	Normal conditions	Turbulence conditions
Helicopters up to 6000 FT (1830m) inclusive	1 min.	100 KT (185 km/h)	
Up to 14.000 FT (4.250 m) inclusive	1 min.	220-230 KT (2) (426 km/h) 170 KT (4) (315 km/h)	280 KT (3) (520 km/h) 170 KT (315 km/h)
Above 14.000 FT (4250 m) to 20.000 FT (6.100 m) inclusive	1½ min.	240 KT (5) (445 km/h)	280 KT (3) (520 km/h) or 0.8 Mach whichever is less
Above 20.000 FT (6100 m) to 34.000 FT (10.350 m) inclusive	1½ min.	265 KT (5) (490 km/h)	280 KT (3) (520 km/h) or 0.8 Mach whichever is less
Above 34.000 FT (6100 m)	1½ min.	0.83 Mach	0.83 Mach

(1) - Tabulated levels represent "altitude" or corresponding "flight levels" depending upon the altimeter setting in use.

(2) - When the holding procedure is followed by the initial segment of an instrument approach procedure promulgated at a higher speed than 230 KT (425 KM/H), the holding should also be promulgated at this higher speed wherever possible.

(3) - The speed of 280 KT (520 KM/H) (0.8 Mach) reserved for turbulence conditions shall be used for holding only after prior clearance with ATC, unless the relevant publications indicate that the holding area can accommodate aircraft flying at this high holding speeds.

(4) - For holding limited to CAT A and B aircraft only and CAT H above 6000FT (1830M).

(5) - Wherever possible, 280 KT (520 KM/H) should be used for holding procedures associated with airway route structures.



Holding Classification (FAA)

Levels (1)	Timing	Normal conditions	Turbulence conditions
Up to 6000 FT (1830m) inclusive	1 min.	200 KT (370 km/h)	
Above 6000 FT (1830 m) to 14.000 FT (4.250 m) inclusive	1 min.	230 KT (2) (426 km/h)	280 KT (3) (520 km/h)
14.001 FT (4251 m) and above	1½ min.	265 KT (5) (490 km/h)	280 KT (3) (520 km/h) or 0.8 Mach whichever is less

Procedure turn Classification

The angle between you current heading and the course guidance

Max 10° on a FAF

Max 90° on a IAF precision approach

Max 120° on a IAF non-precision approach

Circling Radii 1)

Aircraft categories	Vref (KIAS)	Radius
A	less than 90	1.65 Nm
B	90-120	2.66 Nm
C	121-140	4.20 Nm
D	141-165	5.28 Nm
E	166-210	6.94 NM



1) The radius defines the visual manoeuvring area

Q-CODES

QNH: Atmospheric pressure at mean sea level (may be either a local, measured pressure or a regional forecast pressure)

QNE: Pressure altitude in the International Standard Atmosphere (1013.25 mbar at sea level)

QFE: Atmospheric pressure at airfield elevation

QFF: Barometric pressure at a place, reduced to MSL (Mean Sea Level) using the actual temperature at the time of observation as the mean temperature

QDM: Magnetic bearing *to* a station

QDR: Magnetic bearing *from* a station

QFU: Magnetic bearing of the runway in use

QUJ: True bearing *to* a station

QTE: True bearing *from* a station

---- : Relative bearing *to* a station

---- : Relative bearing *from* a station

