

VFR / SVFR / IFR Training Handbook

Integrated Training for vACC SRM Controllers and Pilots

Refer SRM [Radiotelephony Communications Handbook](#) for supporting details



virtual Air-traffic Control Center
Sri Lanka & Maldives

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FRH CONTENTS

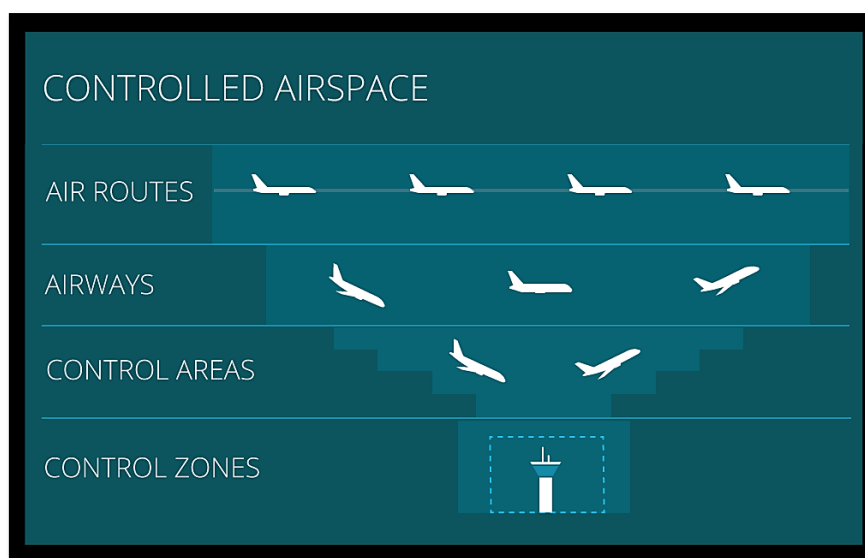
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Note: Information appear in this document extracted from data available in WWW
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1 INTRODUCTION

1.1 Controlled airspace

Controlled airspace means an airspace of defined dimensions within which air traffic control service is provided to IFR flights and to VFR flights in accordance with the airspace classification. (For airspace details refer [vACCSRM S1 Handbook](#), Ch. 4.10 ATS Airspace Classification)

Contents

2 VFR Flight Operation

2.1 VFR Introduction:

2.1.1 There is a major difference between Visual Meteorological Conditions (VMC) and Visual Flight Rules (VFR). VFR stands for visual flight rules, and the term refers to a set of rules for flight in VMC, or Visual Meteorological Conditions. To avoid confusion, it's best to learn the correct terminology from the start: When referring to VFR or VMC, VFR is the type of flight operation or type of flight plan flown by the pilot, and VMC refers to the type of weather conditions.

2.1.2 Air traffic controllers aren't always required to keep VFR aircraft separated from each other like they do for IFR traffic. The responsibility for traffic separation lies solely with the pilot during VFR operations, which means pilot needs to be able to see in front of and around the aircraft while in the air. For this reason, VFR rules also cover visibility requirements and cloud clearance criteria required to fly with visual reference to the ground and/or horizon. These visibility and cloud clearance requirements vary depending on the type of airspace flying in, but they exist to ensure that pilots flying VFR don't get caught up in the clouds and crash into each other.

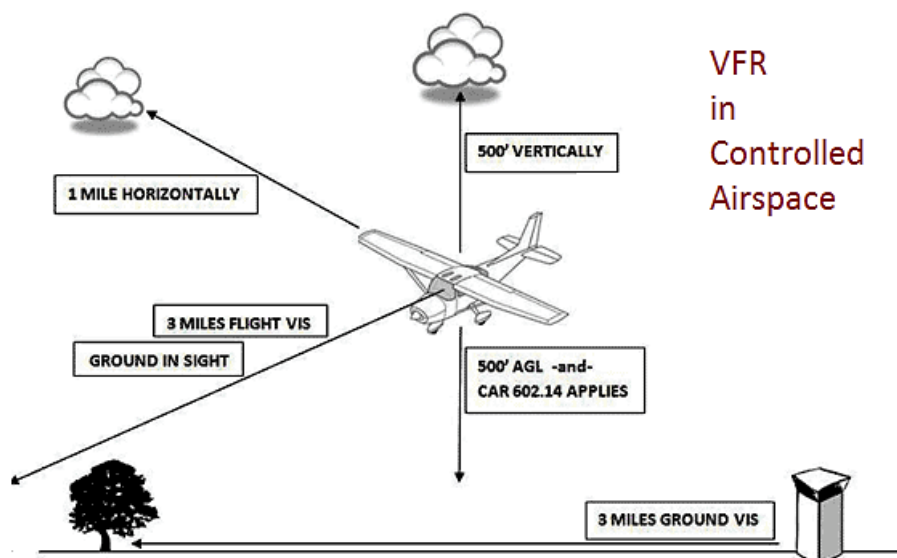
2.2 Visual Flight Rules:

2.2.1 Visual Flight Rules (VFR) concern the regulation associated with flight in Visual Meteorological Conditions (VMC)

2.3 Visual Meteorological Conditions:

2.3.1 No person may operate an aircraft under basic VFR when the flight visibility is less, or at a distance from clouds that is less, than that prescribed for the corresponding altitude and class of airspace

2.3.2 Except as provided in Special VFR Weather Minimums, no person may operate an aircraft beneath the ceiling under VFR within the lateral boundaries of controlled airspace designated to the surface for an airport when the ceiling is less than 1,500'.



2.3.3 Aircraft – Airspace Visibility Requirements

Airspace			Flight Visibility	Clouds Distance
Class A			None	None
Class B			3 statute miles	clear of clouds
Class C			3 statute miles	500 feet below 1,000 feet above 2,000 feet horizontal
Class D			3 statute miles	
Class E	less than 10,000 MSL		3 statute miles	
	at or above 10,000 MSL		5 statute miles	1,000 feet below, 1,000 feet above 1 statute mile horizontal
Class G	1,200 feet or less AGL	Day	1 statute mile	clear of clouds
		Night	3 statute miles	500 feet below 1,000 feet above 2,000 feet horizontal
	more than 1,200 AGL, but less than 10,000 MSL	Day	1 statute mile	
		Night	3 statute miles	
	more than 1,200 AGL, and at or above 10,000 MSL		5 statute miles	1,000 feet below, 1,000 feet above 1 statute mile horizontal

2.4 VFR Night Operations:

Note: As a general rule night VFR operation within VACC SRM is limited to training flights for aerodrome circuits.

2.4.1 There are two specific hazards related to night flying. First, irregular rising terrain can be invisible, even when the weather is good. Especially in remote mountainous areas where ground lighting can be minimal or non-existent, controlled flight into unseen outcroppings of peaks has claimed many a VFR night flight. A failsafe solution is to follow IFR procedures, flying on airways

and observing the published minimum safe altitudes. And following instrument landing procedures — either an ILS or even a non-precision approach - are vital aids to ensuring a safe landing at airports surrounded by terrain or other obstacles.

2.4.2 Another trap for night VFR operations is - IFR weather. A bank of cloud along the route that would raise an alarm from many miles away in daylight can remain invisible at night until the airplane is surrounded by milky vapour. Then, even the dim, indistinct horizon becomes lost and the pilot is forced to rely solely on instruments. The shock of losing visual reference suddenly like that is often sufficient to induce a sense of panic, further eroding chances for a happy outcome. Having said all of that, it's also true that night flying can be hugely soul satisfying. With a full moon and clear star-studded skies, there can be no greater connection to the element we all love - the sky. From a practical point of view, the air is usually smoother at night, devoid of the effects of the sun heating the earth. Fewer airplanes are out flying, reducing the chances of collision, and even those fewer aircraft are often easier to spot with their strobes flashing and position lights glowing. So enjoy night flying, but take all available steps to enjoy it safely.

2.4.3 Follow IFR procedures even when operating VFR; to maintain IFR proficiency, pilots are urged to practice IFR procedures whenever possible, even when operating VFR.

2.5 In VFR flying suggested IFR proficiency practices include:

- a. Obtain a complete pre-flight and weather briefing. Check the NOTAMs.
- b. File a flight plan.
- c. Use current charts.
- d. Use the navigation aids. Practice maintaining a good course-keep the needle centred.
- e. Maintain a constant altitude which is appropriate for the direction of flight.
- f. Estimate enroute position times.
- g. Make accurate and frequent position reports to the ATC along your route of flight.

2.6 VFR Cruising Altitudes:

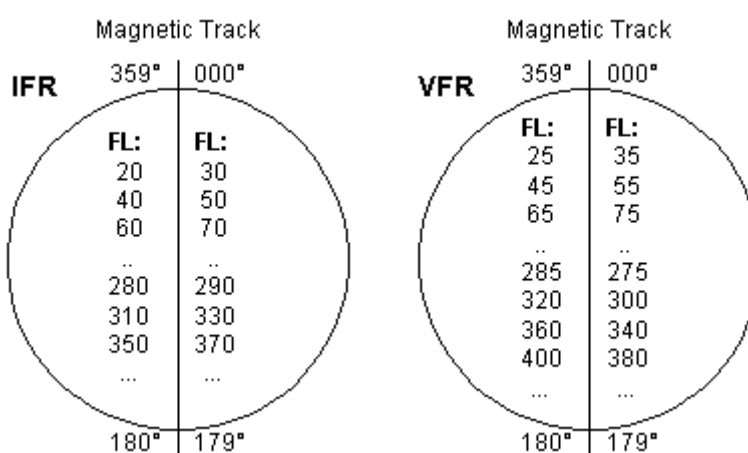
2.6.1 VFR Cruising Altitudes [refer chart below] are established to reduce mid-air collisions by establishing cruise altitudes governed by FAR 91.159 which states:

- a. Except while holding in a holding pattern of 2 minutes or less (VFR Holding - is an ATC instruction to remain clear of a particular area or airspace, or to circle a known point), or while turning, an aircraft under VFR in level cruising flight more than 3,000 feet above the surface shall maintain the appropriate altitude or flight level prescribed below, unless otherwise authorized by ATC:
- b. When operating below 18,000 feet MSL and:

On a magnetic course of zero degrees through 179 degrees, any odd thousand foot MSL altitude + 500 feet (such as 3,500, 5,500, or 7,500).

On a magnetic course of 180 degrees through 359 degrees, any even thousand foot MSL altitude + 500 feet (such as 4,500, 6,500, or 8,500).
- c. When operating above 18,000 feet MSL, maintain the altitude or flight level assigned by ATC. ATC may give other restrictions if aircraft is under ATC control, (with flight following or when within controlled airspace).

VFR Cruising Altitudes and Flight Levels		
If your magnetic course (ground track) is:	And you are more than 3,000 feet above the surface but below 18,000 feet MSL, fly:	And you are above 18,000 feet MSL to FL 290, fly:
0° to 179°	Odd thousands MSL, plus 500 feet (3,500; 5,500; 7,500, etc.)	Odd Flight Levels plus 500 feet (FL 195; FL 215; FL 235, etc.)
180° to 359°	Even thousands MSL, plus 500 feet (4,500; 6,500; 8,500, etc.)	Even Flight Levels plus 500 feet (FL 185; FL 205; FL 225, etc.)



3 Special VFR Flight Operation

3.1 SVFR Introduction:

3.1.1 SVFR is a tool for non-instrument rated pilots to continue operating under Visual Flight Rules (VFR) in Instrument Meteorological Conditions (IMC). Said another way, special VFR allows pilot to fly using the more relaxed Class Golf minimum visibility requirements in more restrictive airspace. VFR requirements will match those of basic VFR minimums if aircraft is within 1200' of the ground, only requiring 1 mile visibility and clear of clouds, despite the airspace class the pilot is operating.

3.1.2 Any pilot flying below 10,000 feet can request a SVFR clearance from ATC and, if the clearance is granted, need only stay out of the clouds – no minimum distance is required. The ground visibility requirement is also reduced to 1 statute mile from the general 3 statute miles for VFR flight in controlled airspace. Essentially, the weather minimums are brought down to Class G airspace requirements below 1,200 feet: one statute mile visibility and clear of clouds.

3.1.3 The clearance issued by ATC is similar to an instrument clearance and must be read back by the pilot. However, if the request is made between sunset and sunrise, the pilot requesting the clearance needs to be a current instrument pilot. However, SVFR at night is never a good idea since it is impossible to determine where the clouds are. Practice good judgement and request an instrument flight plan instead.

3.1.4 Special VFR operations means aircraft operating in accordance with clearances within controlled airspace in meteorological conditions less than the basic VFR weather minima. Such operations must be requested by the pilot and approved by ATC.

3.1.5 The minimum weather need for SVFR (according to FAR 91.157):

1. 1 SM flight visibility
2. Clear of clouds

Then the next question: can a non-instrument rated private pilot get a Special VFR clearance? The answer is yes, as long as flying time is between sunrise and sunset.

3.1.6 It is important to keep in mind that SVFR is possible at night, but the requirements go up significantly: Pilot must be qualified for instrument flight under FAR 61, and the aircraft must be equipped for instrument flight. Basically, pilot need to be ready to go IFR. It is important to note that IFR traffic has priority over SVFR.

3.2 Special VFR Requirements:

3.2.1 Fixed Wing:

Day:

- a. ATC Clearance (before entering controlled airspace)
- b. Clear of clouds
- c. At least 1 statute mile flight visibility

Between sunrise and sunset unless:

Night:

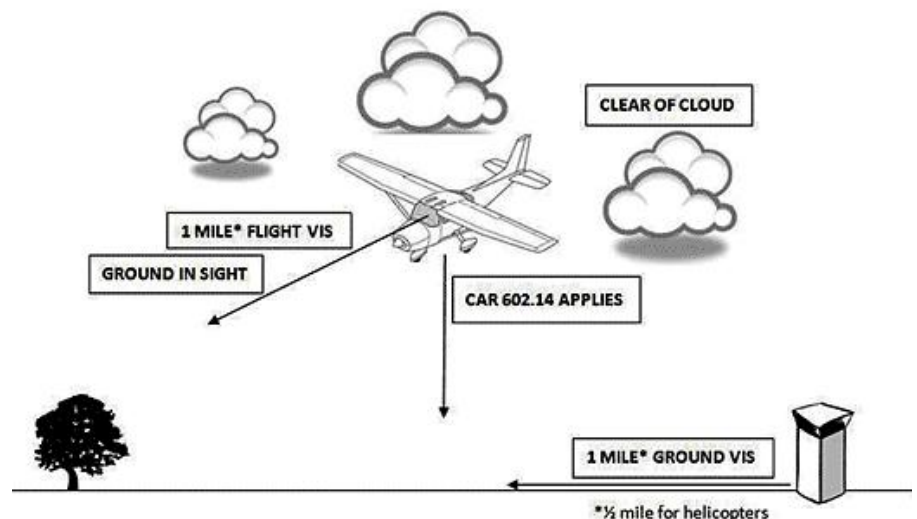
- a. Day requirements, plus:
- b. Be instrument rated
- c. Aircraft is equipped in accordance with VFR during the day, IFR at night

3.2.2 Rotary Wing:

Helicopters are afforded certain exceptions that fixed-wing are not:

1. At night pilots need not be IFR certified
2. Helicopters must remain clear of clouds and may operate in Class B, Class C, Class D, and Class E surface areas with less than 1 statute mile visibility

Special VFR in Controlled Airspace



3.3 SVFR Clearances:

3.3.1 An ATC clearance must be obtained prior to operating within a Class B, Class C, Class D, or Class E surface area when the weather is less than that required for VFR flight.

3.3.2 Clearances may be obtained from tower, or Approach, Center, or Flight Service Station (FSS) when no tower exists.

3.3.3 The PILOT must request the clearance.

3.3.4 The VFR pilot may request and be given a clearance to enter, leave, or operate within most areas in SVFR conditions, traffic permitting, and providing such flight will not delay IFR operations.

- 3.3.5 It is not necessary to file a complete flight plan with the request for clearance, but pilot should state the intentions in sufficient detail to permit ATC to fit the flight into the traffic flow.
- 3.3.6 The clearance will not contain a specific altitude as the pilot must remain clear of clouds. (Ex. Operate at or below 3000ft)
- 3.3.7 The controller may require the pilot to fly at or below a certain altitude due to other traffic, but the altitude specified will permit flight at or above the minimum safe altitude.
- 3.3.8 In addition, flights may be vectored if necessary for control purposes or on pilot request. Note that as per FAR 91.119, the pilot is still ultimately responsible for obstacle or terrain clearance.
- 3.3.9 Traffic separation will be provided from IFR aircraft, other SVFR traffic.
- 3.3.10 ATC does not provide separation after an aircraft leaves the Class B, Class C, Class D, or Class E surface area on a SVFR clearance.
- 3.3.11 Pilots arriving or departing an uncontrolled airport should monitor the Unicom frequency, announce their intentions prior to operating within the Class B, Class C, Class D, or Class E surface areas.

3.4 Conclusion:

- 3.4.1 A pilot with VFR equipment during the day can request SVFR, it is not until night that must be instrument rated, as well as the aircraft instrument equipped.
- 3.4.2 Special VFR is a tool available to any private pilot.
- 3.4.3 ATC will never solicit a SVFR clearance unless specifically requested by the pilot.
- 3.4.4 Pilot should always maintain the 'personally capable' minimums regardless of what the regulations allowed.



4 IFR Flight Operation

4.1 IFR Introduction:

- 4.1.1 Instrument flight rules govern a specific type of aviation where flight may be conducted with reference to the flight instruments alone (i.e., no outside references). IFR stands for instrument flight rules – the set of rules that govern aircraft that fly in IMC, or Instrument Meteorological Conditions. In general terms, it means flying in the clouds. More specifically, IMC is defined as weather that is “below the minimums prescribed for flight under Visual Flight Rules.”
- 4.1.2 It is called instrument flight because the pilot navigates only by reference to the instruments in the aircraft cockpit. Flying in the clouds / fog (IMC) requires an IFR flight plan and an instrument rating. Instrument flying involves a higher degree of precision and professionalism than VFR flying, and it's a necessary step to becoming a professional pilot.
- 4.1.3 Unlike VFR flights IFR happens usually within controlled airspace and requires filing a flight plan ahead of time. The routing is not completely at the pilot's discretion. Established waypoints and airways have to be used and the altitude for the flight is determined by things like minimum airway altitude, minimum radar vectoring altitude (MRVA) and traffic situation.

4.2 IFR Operations to High Altitude Destinations:

- 4.2.1 Pilots planning IFR flights to airports located in mountainous terrain are cautioned to consider the necessity for an alternate airport even when the forecast weather conditions would technically relieve them from the requirement to file one.
- 4.2.2 Situations where the failure to plan for an alternate airport when flying IFR to such a destination airport could result in a critical situation if the weather is less than forecast and sufficient fuel is not available to proceed to a suitable airport.
- 4.2.3 An IFR flight to an airport which requires special equipment; i.e., DME, glide slope, etc., in order to make the available approaches to the lowest minimums. Pilots should be aware that all other minimums on the approach charts, may require weather conditions better than those specified.

4.3 Requirements to operate IFR:

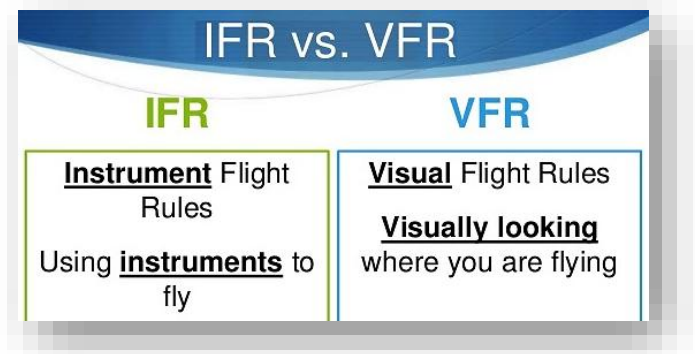
- File an IFR flight plan
- Receive an appropriate ATC clearance
- IFR rated/licensed (not considered in Vatsim)
- IFR equipped aircraft
- Fuel requirements for flight in IFR conditions

f. No person may operate a civil aircraft in IFR conditions unless it carries enough fuel (considering weather reports and forecasts and weather conditions) to:

Complete the flight to the first airport of intended landing;

*Fly from that airport to the alternate airport; and

Fly after that for 45 minutes at normal cruising speed or, for helicopters, fly after that for 30 minutes at normal cruising speed.



4.4 Taking-off and Landing under IFR

4.4.1 When an aircraft takes-off on an instrument flight plan, there are several methods for the aircraft to safely reach their desired track whilst maintaining clearance from the surrounding terrain. However, every aerodrome has a specified minimum cloud ceiling and visibility requirement before aircraft can get airborne. Some departure procedures are:

- Visual departure:** The pilot must maintain terrain clearance visually until above the route minimum safe altitude (MSA).
- Turn on track:** The aircraft can turn onto track provided the aircraft meets the minimum climb gradient requirements.
- Radar vectors:** Air traffic control provides vectors that the pilot must follow to avoid terrain.
- Standard Instrument Departures (SID):** Procedures that ensure terrain clearance and are published for each IFR aerodrome.

4.4.2 Once the aircraft reaches its destination, it must make an approach to land. Should the weather conditions permit, the aircraft may carry out a visual approach (maintain terrain clearance visually) however, if this is not the case and instrument approach will need to be carried out. Instrument approaches are either based on ground-based aids (VOR, NDB or ILS) or GNSS signals (known as RNAV approaches).

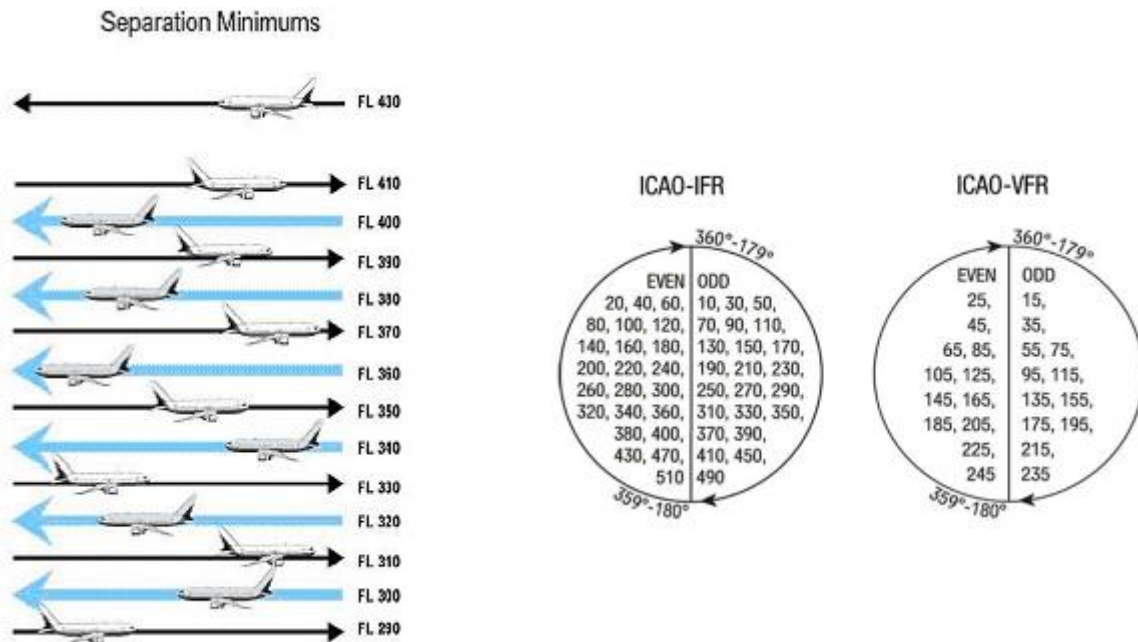
4.4.3 Each of these approaches will have a specified minimum descent altitude (MDA). The pilot is not permitted to descent below this height unless the visibility requirement is met and the pilot has one of the required visual references in sight for the runway of intended landing. These references include, but are not limited to the runway threshold, runway lights or the visual approach slope indicators.

4.5 IFR Flight Levels

4.5.1 At FL 410 and above, 4,000 ft intervals are resumed to separate same-direction aircraft and **only odd Flight Levels** are assigned, depending on the direction of flight:

Track 000 to 179° – odd flight levels (FL410, FL450, FL490, etc.)

Track 180 to 359° – odd flight levels (FL430, FL470, FL510, etc.)

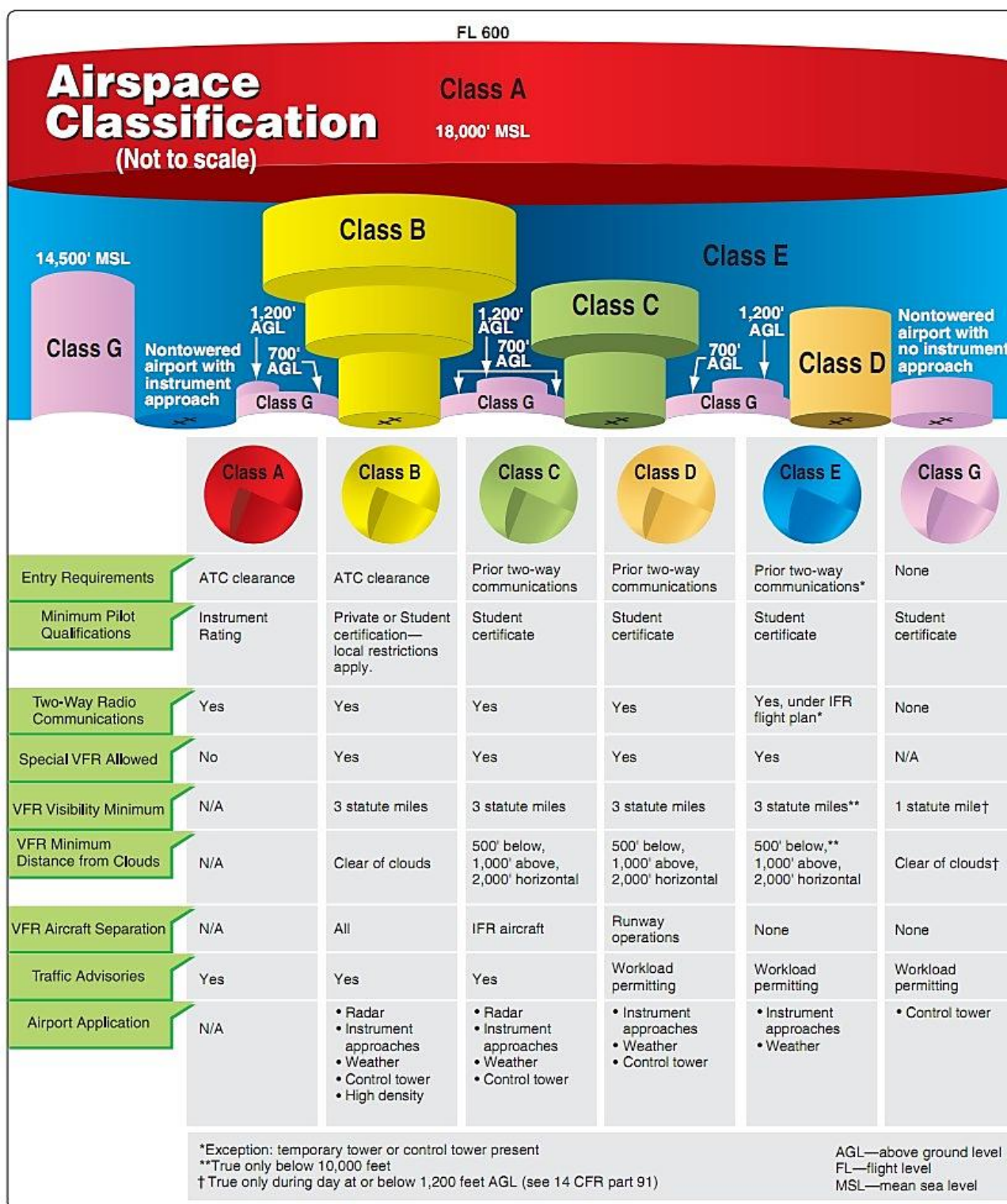


Note: Metric flight levels are not used within Vatsim West Asia region. Any aircraft using Metric flight level either descend or climb to standard flight level as required.

4.6 Conclusion:

When weather conditions permit, during the time an IFR flight is operating, it is the direct responsibility of the pilot to avoid other aircraft since VFR flights may be operating in the same area without the knowledge of ATC Traffic clearances provide standard separation only between IFR flights.

5 Airspace Classifications



6 Emergency Flight Operation

6.1 Vatsim Emergency Flight Introduction:

6.1.1 Vatsim pilot is allowed to declare an emergency (excluding hijack emergencies, squawking 7500 or real-life aircraft accidents) whilst under ATC prerogative. Controller will act appropriately and assist the emergency, i.e. guiding or vectoring the aircraft to a nearest suitable airfield.

6.1.2 However, the controller also reserves the right to deny the emergency and ask the pilot to either cancel the emergency, or to disconnect and continue simulating the emergency offline. This can happen for various reasons (Ex: Events, Exams, Mentoring sessions) & it is at the full discretion of the controller.

6.2 Classification of Emergency Situation:

‘May Day’ Distress call: A condition of being threatened by serious and/or imminent danger and of requiring immediate assistance.

‘Pan Pan Pan’ Urgency call: A condition concerning the safety of aircraft or person on board, but does not require immediate assistance.

The emergency message shall contain following information:	Example of aircraft message:
1. ‘MAYDAY / MAYDAY / MAYDAY’ (or ‘PAN PAN / PAN PAN / PAN PAN’)	MAYDAY MAYDAY MAYDAY
2. Name of the station addressed	Colombo Approach
3. Callsign of aircraft	AIC123
4. Type of aircraft	Airbus A320
5. Nature of the emergency	engine fire
6. Intention of the pilot	expect immediate landing

6.2.1 Controller Actions:

- Controller should acknowledge the emergency. (Assign SQ 7700 as required)
- Request to report endurance/fuel remaining & number of People On Board (POB) when able.
- Inform nearest available airfields, runways and METAR as required.
- Keep other controllers above and below you informed.
- Inform required Fire & Medical assistance is available on landing.
- Assign and inform Parking stand.



PILOT- MAYDAY MAYDAY MAYDAY...(msg)

ATC- AIC123, Colombo Approach, Roger Mayday (or Copy Mayday). Reset Sq 7700 (as required).

PILOT- Sq 7700, AIC123

ATC- Report Endurance/fuel remaining & Number of people on board (POB) when able

PILOT- POB 128, Endurance 2hrs, AIC123

- Controller proceeds with priority instructions until landing.
- Keep other traffic away from Mayday aircraft approach path. Coordinate with other controllers as required.

- If the pilot finds it appropriate to cancel the emergency, the controller should be informed.

PILOT- Colombo Approach, AIC123, Mayday cancelled (due...).

ATC- AIC123, roger Mayday cancelled, time 1335z, reset Sq1234

- When the emergency situation has been resolved, the controller will transmit a message indicating that normal working is resumed.

ATC- All stations, Colombo Approach, distress traffic ended.

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