National Airspace System

Tom Rogers CFI-AI-MEI

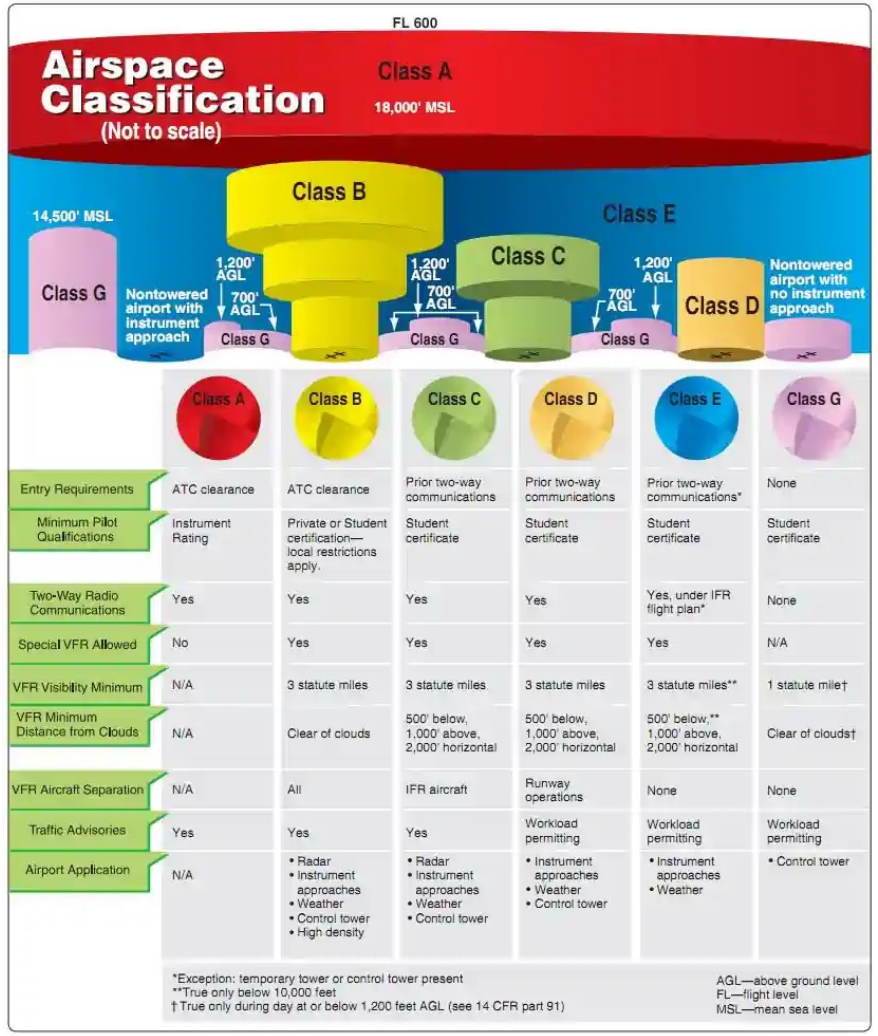
Airspace Classifications

14 CFR Part 91

Pilots Handbook of Aeronautical Knowledge (PHAK FAA-H-8083-25B)

Aeronautical Information Manual

- Regulatory
  - Class A, B, C, D, E
  - Restricted and prohibited
- Non-regulatory
  - MOAs
  - Warning areas
  - Controlled firing areas
  - Alert areas



	Class A	Class B	Class C	Class D	Class E	Class G
Entry Requirements	ATC clearance	ATC clearance	Prior two-way communications	Prior two-way communications	Prior two-way communications*	None
Minimum Pilot Qualifications	Instrument Rating	Private or Student certification—local restrictions apply.	Student certificate	Student certificate	Student certificate	Student certificate
Two-Way Radio Communications	Yes	Yes	Yes	Yes	Yes, under IFR flight plan*	None
Special VFR Allowed	No	Yes	Yes	Yes	Yes	N/A
VFR Visibility Minimum	N/A	3 statute miles	3 statute miles	3 statute miles	3 statute miles**	1 statute mile†
VFR Minimum Distance from Clouds	N/A	Clear of clouds	500' below, 1,000' above, 2,000' horizontal	500' below, 1,000' above, 2,000' horizontal	500' below,** 1,000' above, 2,000' horizontal	Clear of clouds†
VFR Aircraft Separation	N/A	All	IFR aircraft	Runway operations	None	None
Traffic Advisories	Yes	Yes	Yes	Workload permitting	Workload permitting	Workload permitting
Airport Application	N/A	• Radar • Instrument approaches • Weather • Control tower • High density	• Radar • Instrument approaches • Weather • Control tower	• Instrument approaches • Weather • Control tower	• Instrument approaches • Weather	• Control tower

*Exception: temporary tower or control tower present
**True only below 10,000 feet
† True only during day at or below 1,200 feet AGL (see 14 CFR part 91)

AGL—above ground level
FL—flight level
MSL—mean sea level

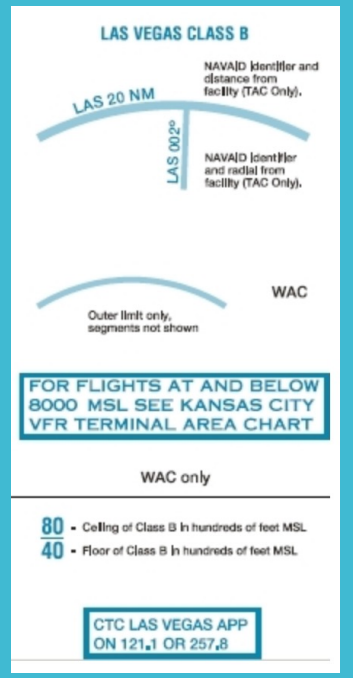
- Four types airspace—controlled, uncontrolled, special use, other

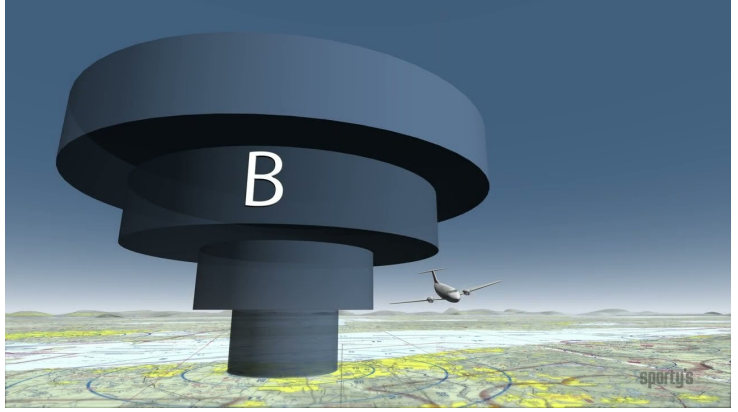
Class A

- Airspace from 18,000’ MSL up to and including FL600. Includes airspace overlying the waters within 12 NM of the coast of CONUS and Alaska.
- All flights must be conducted under IFR:
- IFR rated and equipped airplane (DME)
- Instrument rated pilot
- Requires ATC clearance (IFR flight plan)

Class B

VFR corridor

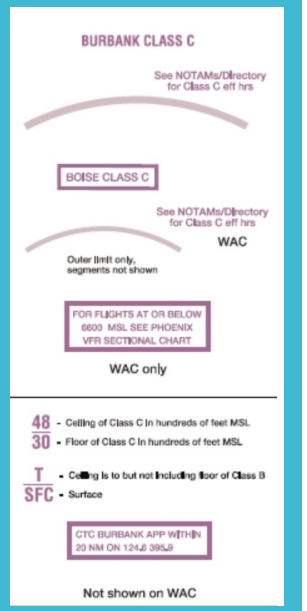


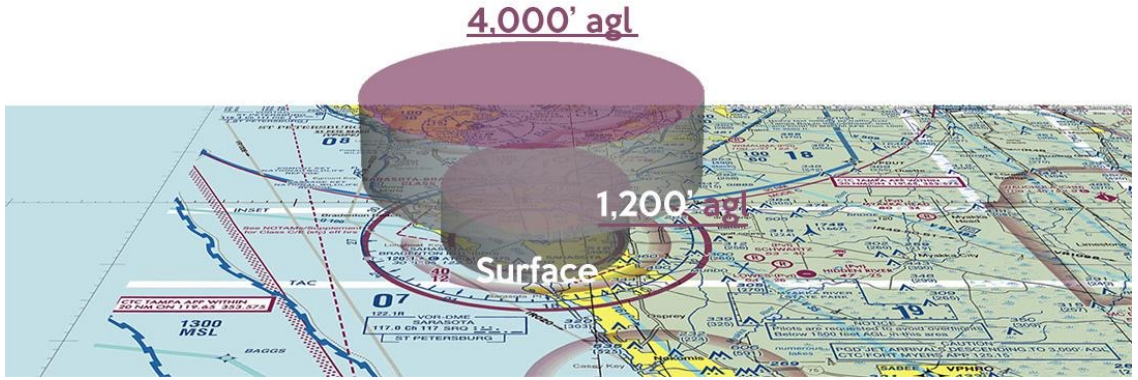


- Generally, the airspace from the surface up to 10,000' MSL surrounding the busiest airports. Consists of a surface area and two or more layers (upside down cake)—designed to contain all instrument procedures. Separation services provided.
- Speed restrictions: inside a layer 250 knots, under a shelf 200 knots. Entry requirements: ATC clearance.
- Required equipment: two-way communication, 4096-code transponder with altitude reporting capability.
- Pilot requirements: a private pilot certificate, except student pilots and recreational pilots seeking private pilot certification that have an endorsement *[14 CFR 61.95]*. Some Class B airports prohibit student operations.
- Weather requirements: 3 SM visibility, clear of clouds.
- Chart depiction: solid blue line

VFR Corridor - Small area that cuts through Class B airspace where pilots can operate VFR without clearance.

Class C

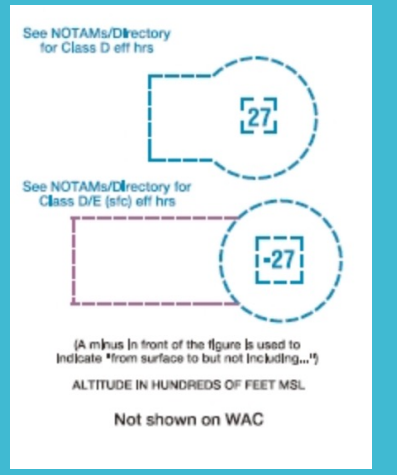




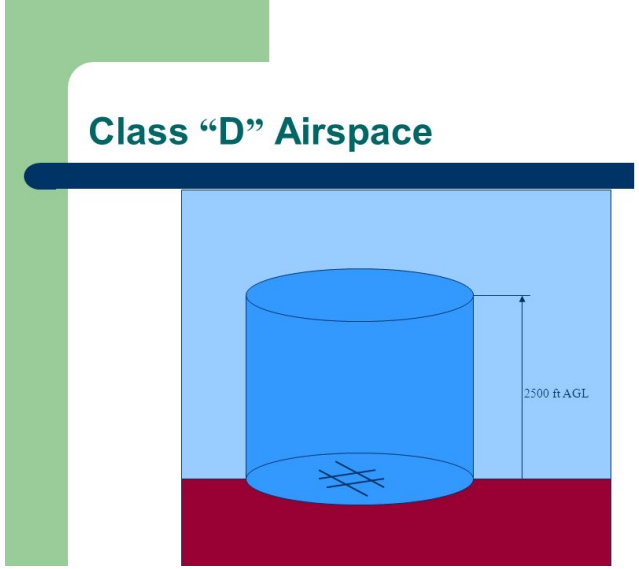
Generally, extends from surface to 4,000' above the airport elevation. Airports have an operational control tower and are serviced by a radar approach control. Airport must have a certain number of IFR operations or passenger enplanements.

IFR and participating VFR traffic separation, VFR traffic advisories on a workload permitting basis.

- Typically, 5 NM surface area radius (surface to 4,000' AGL), 10 NM outer circle (1,200'-4,000' AGL).
- Speed restrictions: within 4 NM radius of primary airport 200 knots. Entry requirements: two-way communication
- Required equipment: two-way radio, transponder with altitude reporting capability.
- Weather requirements: 3 SM visibility, 1,000' above, 500' below, 2,000' horizontal.
- Chart depiction: solid magenta line
- Mode C veil: 30 NM radius that requires a transponder with altitude encoding capability



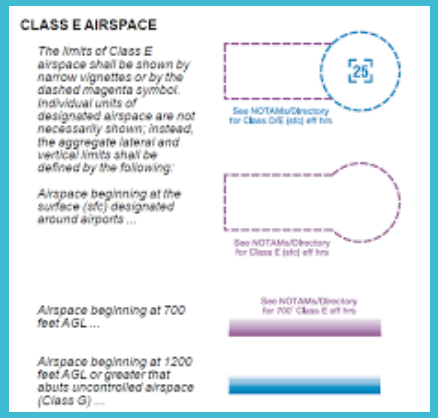
Class D



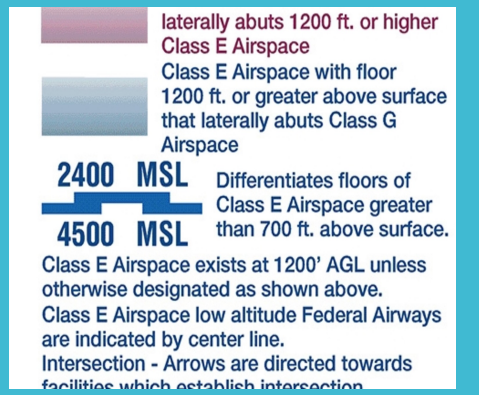
Generally, extends from surface to 2,500' above the airport's elevation. Normally has a 4 NM radius but changes depending on needs. Part time operational control tower is Class D when tower is in operation, Class E otherwise.

Airspace configured to meet operational needs and instrument procedures of the area.

- Speed restrictions: 200 knots.
- Entry requirements: two-way communications. Required equipment: two-way radio.
- Weather requirements: 3 SM visibility, 1,000' above 500' below, 2,000' horizontal.
- Chart depiction: dashed blue line.



Class E



Controlled airspace that is not designated A, B, C, or D. IFR separation provided, VFR advisories upon request and on a workload permitting basis.

Unless otherwise depicted, begins at 14,500' MSL, up to but not including 18,000' MSL, overlying CONUS, Alaska, the waters 12 NM from the coast, and DC. Extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. Speed restrictions: 250 knots below 10,000' MSL.

- Entry requirements: none for VFR.
- Weather requirements: below 10,000' 3SM visibility, 1,000' above, 500' below, 2,000' horizontal; at or above 10,000' MSL 5 SM visibility, 1,000' above, 1,000' below, 1,000' horizontal.
- Chart depiction: depends on beginning altitude…
  - Dotted magenta line—starts at surface.
  - Ombre magenta—starts 700' above the surface.
  - Ombre blue—starts 1,200' or greater above the surface.

Low Altitude Airway System

Class E

Connects one navaid to another.

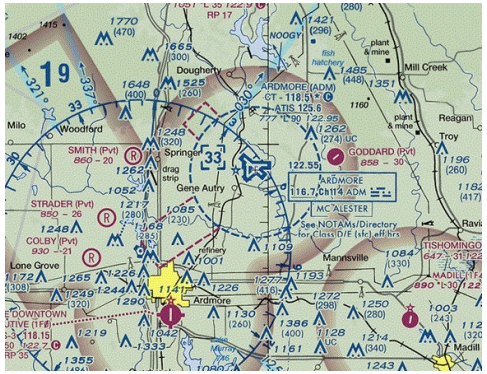
Victor Airways—VOR to VOR; usually 8 NM wide.

Unless otherwise specified, extend upward from 1,200’ AGL up to, but not including, 18,000’ MSL.

Extension to surface area

Transition airspace

Class E



Class E areas can serve as extensions to Class B, C, D surface areas designated for an airport. Extensions provide controlled airspace to contain standard instrument approach procedures without imposing a communications requirement on VFR operating pilots.

- Allows IFR traffic to remain in controlled airspace while transitioning between enroute and airport environments. Begin at either 700' AGL or 1,200' AGL as depicted.

Enroute domestic areas: Provide controlled airspace in those areas where there is a requirement to provide IFR enroute ATC services, but the Federal Airway System is inadequate. Airspace areas that extend upward from a specified altitude as an enroute domestic areas.

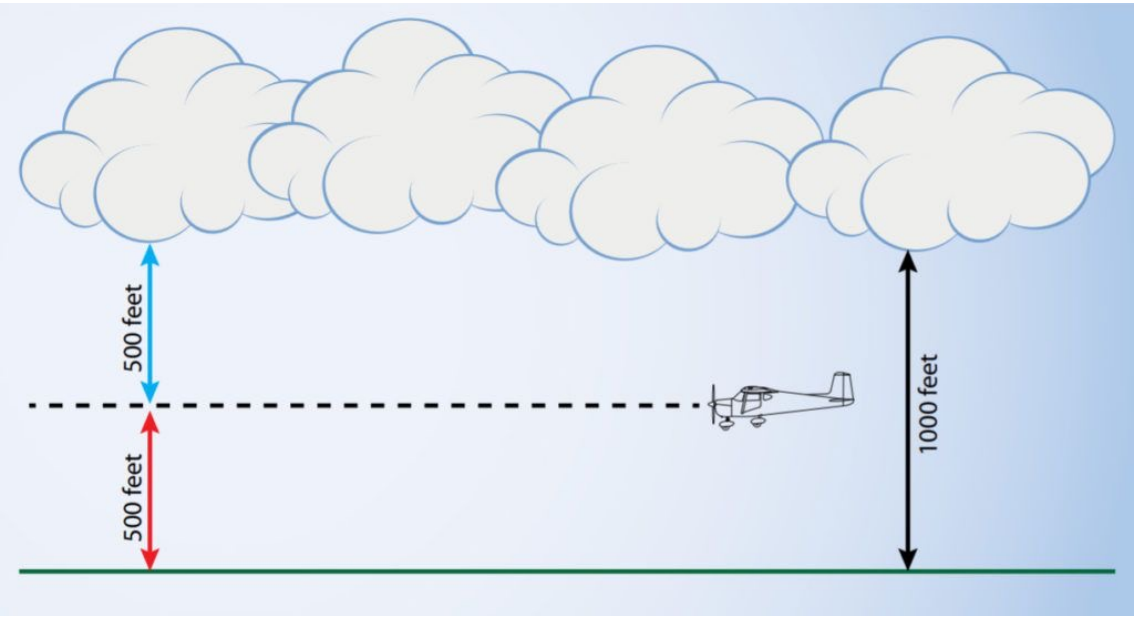
Offshore airspace areas: Provide IFR enroute ATC services within which the US is applying domestic procedures. Airspace areas that extend upward from a specified altitude to, but not including, 18,000' MSL, to provide controlled airspace beyond 12 NM from the coast.

Class G

Uncontrolled airspace; extends from the surface to the base of the overlying Class E airspace. ATC provides VFR advisories upon request on a workload permitting basis.

- Weather requirements: based on day/night operations and altitude
  - Below 1,200' AGL, day—1 SM visibility, clear of clouds.
  - Below 1,200' AGL, night—3 SM visibility, 1,000' above, 500' below, 2,000' horizontal.
  - Below 10,000' MSL, day—1 SM visibility, 1,000' above, 500' below, 2,000' horizontal.
  - Below 10,000' MSL, night—3 SM visibility, 1,000' above, 500' below, 2,000' horizontal.
  - At or above 10,000 MSL—5 SM visibility, 1,000' above, 1,000' below, 1 SM horizontal.

Special VFR
14 CFR 91.157



During the day, SVFR requires

- ATC clearance (Class D or Class E)
- 1 SM visibility
- Clear of clouds

At night, the pilot must be instrument rated and the aircraft must be IFR equipped.

Transponder requirements

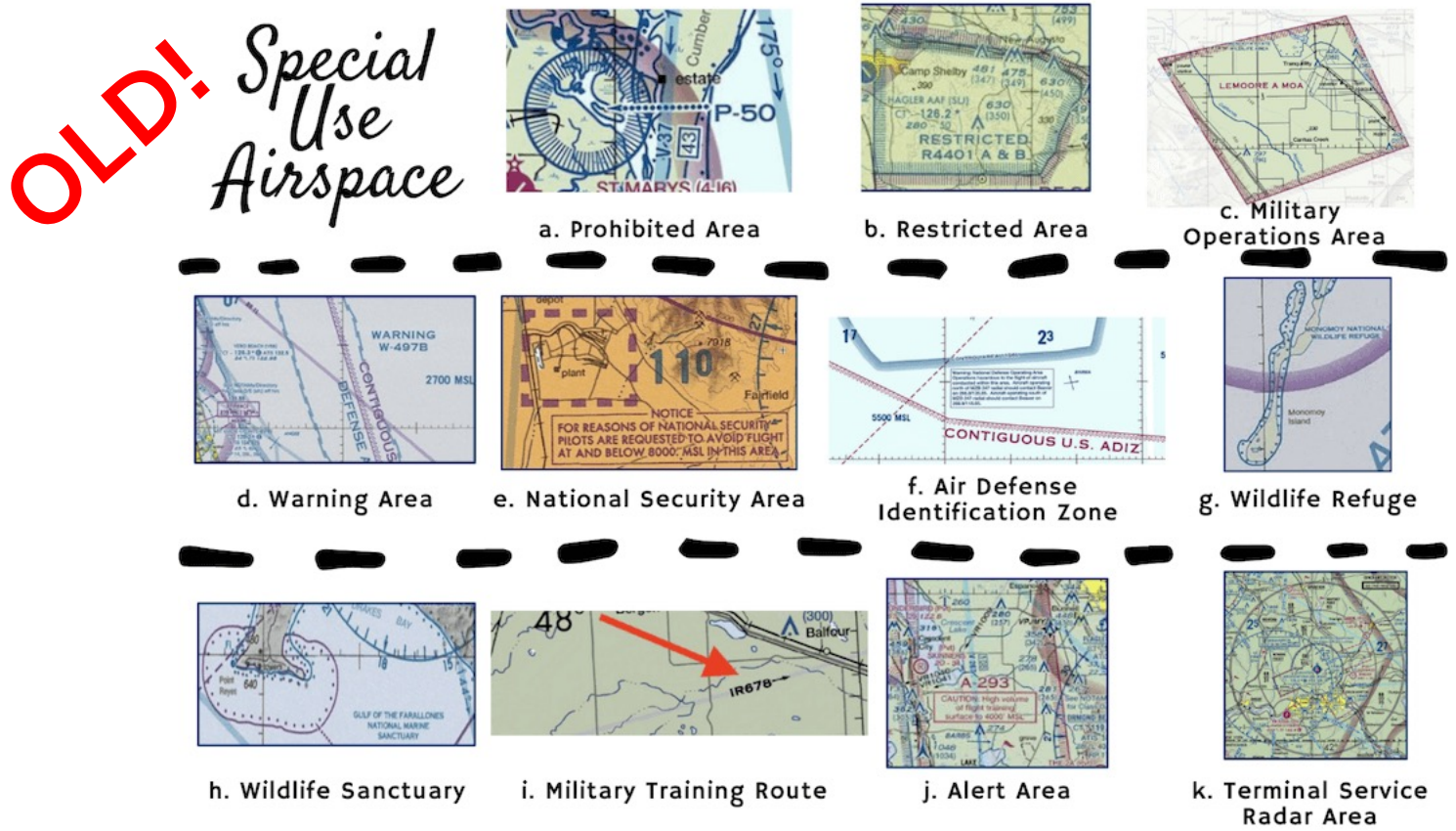
14 CFR 91.215(d)

- At or above 10,000’ MSL, excluding airspace below 2,500’ AGL.
- Within 30 NM of a Class B primary airport below 10,000’ MSL.
- Within and above all Class C airspace up to 10,000’ MSL.
- Within 10 NM of certain designated airports, excluding airspace which is both outside the Class D surface area and below 1,200’ AGL.
- Flying into, within, or across the ADIZ.
- ADSB in Class A, B, C, and E airspace.

Airspeed restrictions
14 CFR 91.117

- Below 10,000’ MSL 250 knots
- Below 2,500’ AGL within 4 NM of the Class C, D primary airport
  - 200 knots
- Underlying Class B airspace designated for an airport or in a VFR corridor through Class B airspace 200 knots

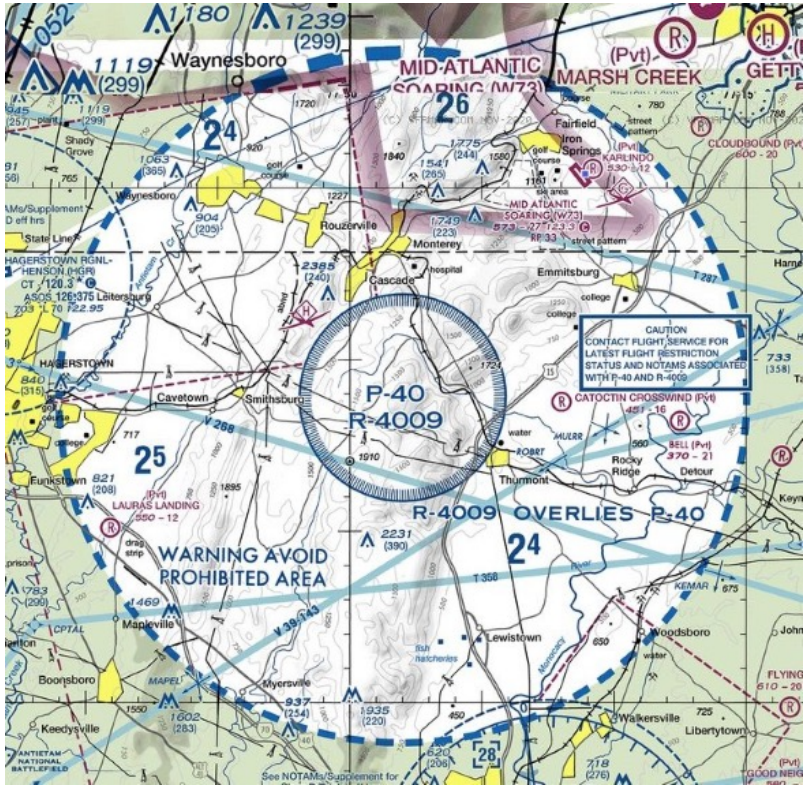
Special use airspace



- For flight activities that need to be confined and set aside from general traffic for safety and national security considerations.
- Protect areas from aircraft operations
- Places limitations on aircraft that are not taking part in the activities.

Special use airspace

Prohibited areas



Airspace within which flight is prohibited. Established for security or other purposes associated with national welfare. Published in Federal Register (Act of law by Congress) and depicted on aeronautical charts.

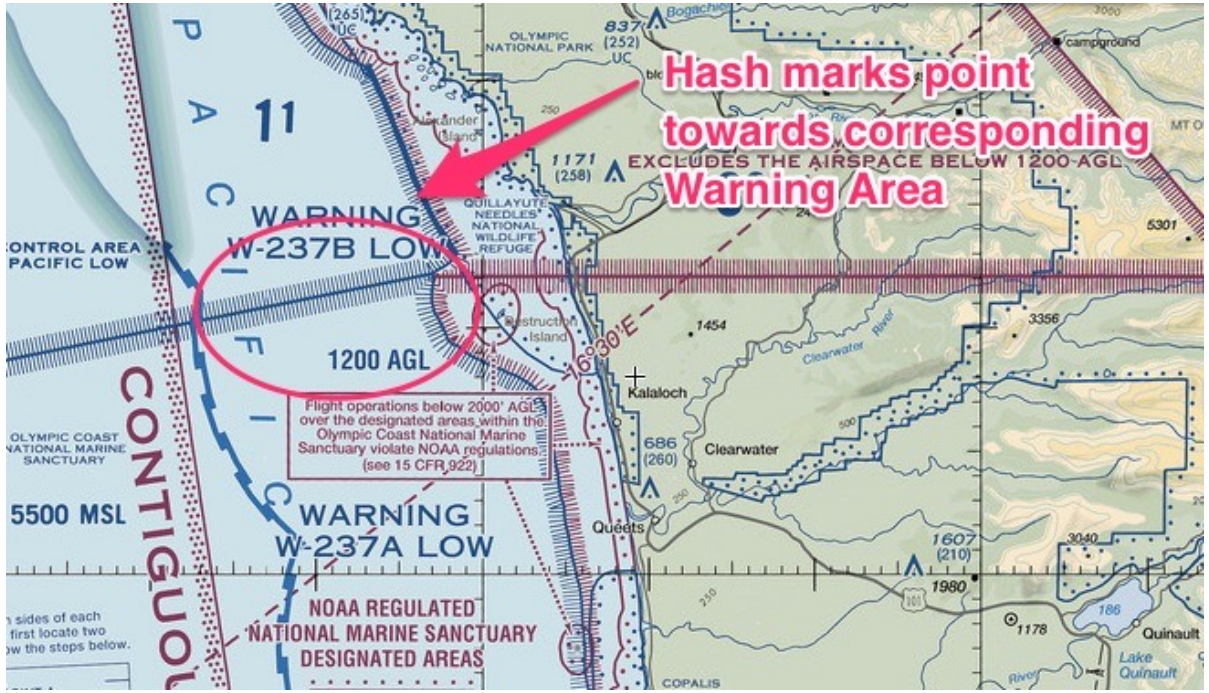
Special use airspace

Restricted areas

- Flight of aircraft is not wholly prohibited but is subject to restrictions.
- Denotes unusual and often invisible hazards to aircraft (artillery firing, aerial gunnery, guided missiles, …) Published in Federal Register and depicted on aeronautical charts.
- Cannot enter without permission from the controlling agency. ATC will allow aircraft to operate in the airspace if it's inactive and will ensure that the aircraft avoids the restricted area if the airspace is active.

Special use airspace

Warning areas



- Airspace extending from 3 NM outward from the coast. May be hazardous to nonparticipating aircraft (similar activities to those in restricted area). Depicted on aeronautical charts.
- Purpose: to warn nonparticipating traffic of potential danger.

Special use airspace

Military operation areas (MOA)

- Airspace established to separate certain military training activity from IFR traffic. No restrictions against VFR operating pilots in these areas but be alert. Depicted on aeronautical charts.
- IFR traffic may be cleared through the MOA if IFR separation can be provided. Otherwise, IFR traffic will be rerouted.

Special use airspace

Alert areas

Advise pilots that high volume of pilot training or unusual aerial activity is taking place. Depicted on aeronautical charts.

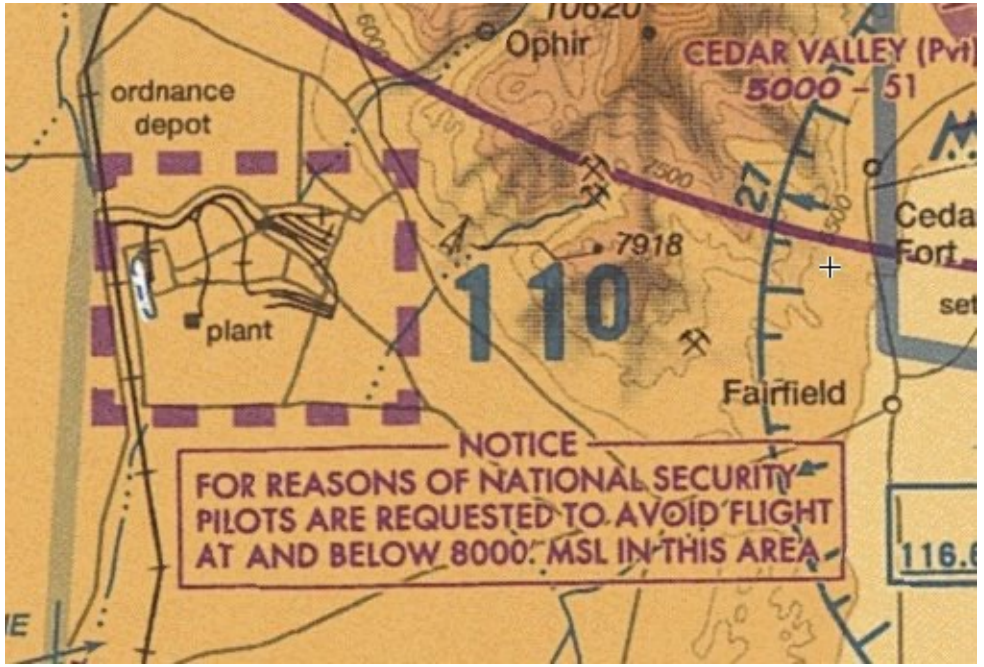
Special use airspace

Controlled firing area

CFAs contain activities which, if not conducted in a controlled environment, could be hazardous to nonparticipating aircraft. The distinguishing feature of the CFA, as compared to other special use airspace, is that its activities are suspended immediately when spotter aircraft, radar, or ground lookout positions indicate an aircraft might be approaching the area. There is no need to chart CFAs since they do not cause a nonparticipating aircraft to change its flight path.

Special use airspace

National Security areas



NSAs consist of airspace of defined vertical and lateral dimensions established at locations where there is a requirement for increased security and safety of ground facilities. Pilots are requested to voluntarily avoid flying through the depicted NSA. When it is necessary to provide a greater level of security and safety, flight in NSAs may be temporarily prohibited by regulation under the provisions of 14 CFR Section 99.7. Regulatory prohibitions will be issued by System Operations Security and disseminated via NOTAM.

Other Airspace

- Airspace that does not fit into ICAO defined airspace or may be non-regulatory in nature.

Other airspace

Airport Advisory/Information Services

In Alaska only. Where non-towered airports have a FSS located, the FSS acts as an advisory service to pilots.

Other airspace

Military Training Routes

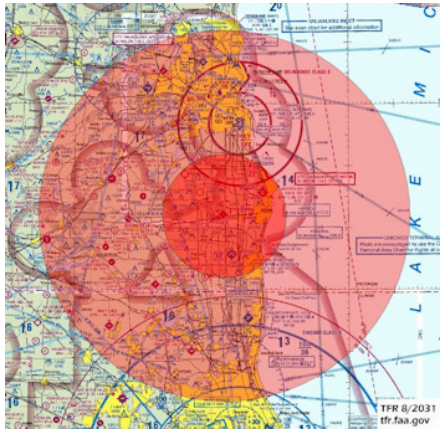
IFR Military Training Routes-(IR). Operations on these routes are conducted in accordance with IFR regardless of weather conditions.

VFR Military Training Routes-(VR). Operations on these routes are conducted in accordance with VFR except flight visibility must be 5 miles or more; and flights must not be conducted below a ceiling of less than 3,000 feet AGL.

Other airspace

Temporary Flight Restrictions TFRs

Active by NOTAM



Request permission to enter From published controlling agency

The purpose for establishing a temporary flight restrictions area is to:

- Protect persons and property in the air or on the surface from an existing or imminent hazard associated with an incident on the surface when the presence of low flying aircraft would magnify, alter, spread, or compound that hazard (14 CFR Section 91.137(a)(1));
- Provide a safe environment for the operation of disaster relief aircraft (14 CFR Section 91.137(a)(2)); or
- Prevent an unsafe congestion of sightseeing aircraft above an incident or event which may generate a high degree of public interest (14 CFR Section 91.137(a)(3)).
- Protect declared national disasters for humanitarian reasons in the State of Hawaii (14 CFR Section 91.138).
- Protect the President, Vice President, or other public figures (14 CFR Section 91.141).
- Provide a safe environment for space agency operations (14 CFR Section 91.143).

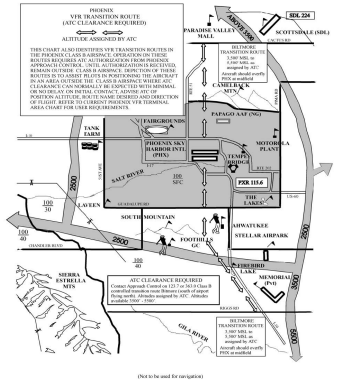
Other airspace

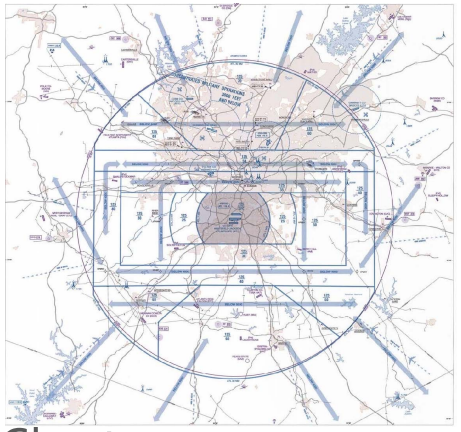
Parachute Jump Aircraft Operations

Not depicted on aeronautical charts. Find them in the Chart Supplement.

Other airspace

Published VFR Routes





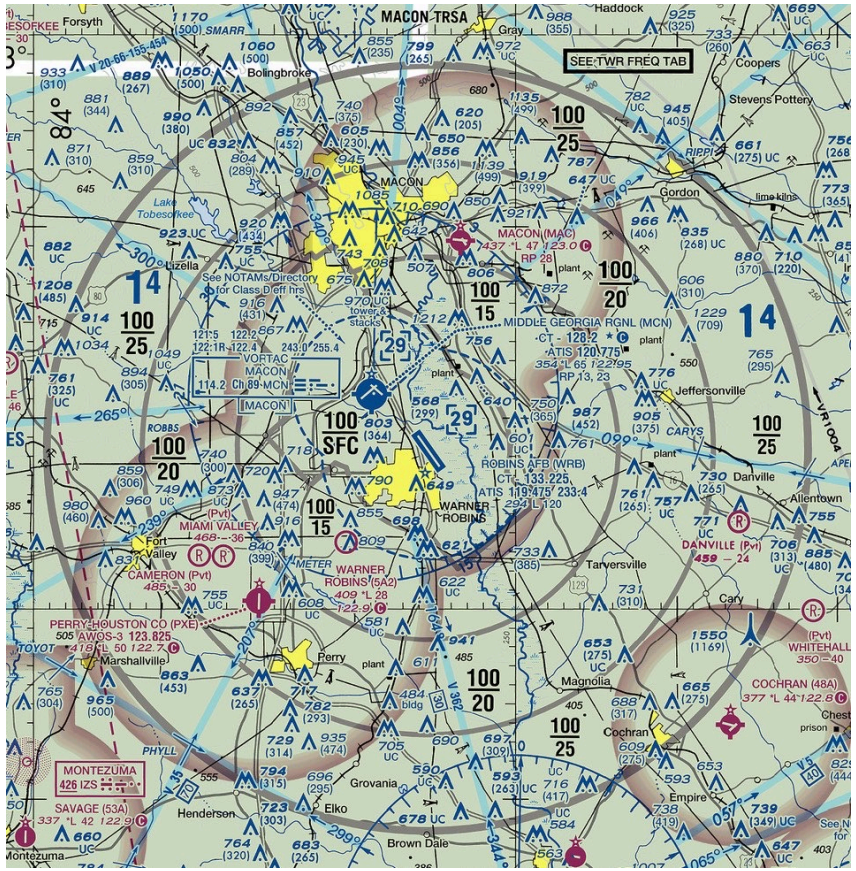
VFR Flyways and their associated Flyway Planning Charts were developed from the recommendations of a National Airspace Review Task Group. A VFR Flyway is defined as a general flight path not defined as a specific course, for use by pilots in planning flights into, out of, through or near complex terminal airspace to avoid Class B airspace.

VFR Corridors These corridors are, in effect, a "hole" through Class B airspace.

Class B Airspace VFR Transition Routes To accommodate VFR traffic through certain Class B airspace, such as Seattle, Phoenix and Los Angeles, Class B Airspace VFR Transition Routes were developed. A Class B Airspace VFR Transition Route is defined as a specific flight course depicted on a TAC for transiting a specific Class B airspace. These routes include specific ATC-assigned altitudes, and pilots must obtain an ATC clearance prior to entering Class B airspace on the route.

Other airspace

Terminal Radar Service Area (TRSA)

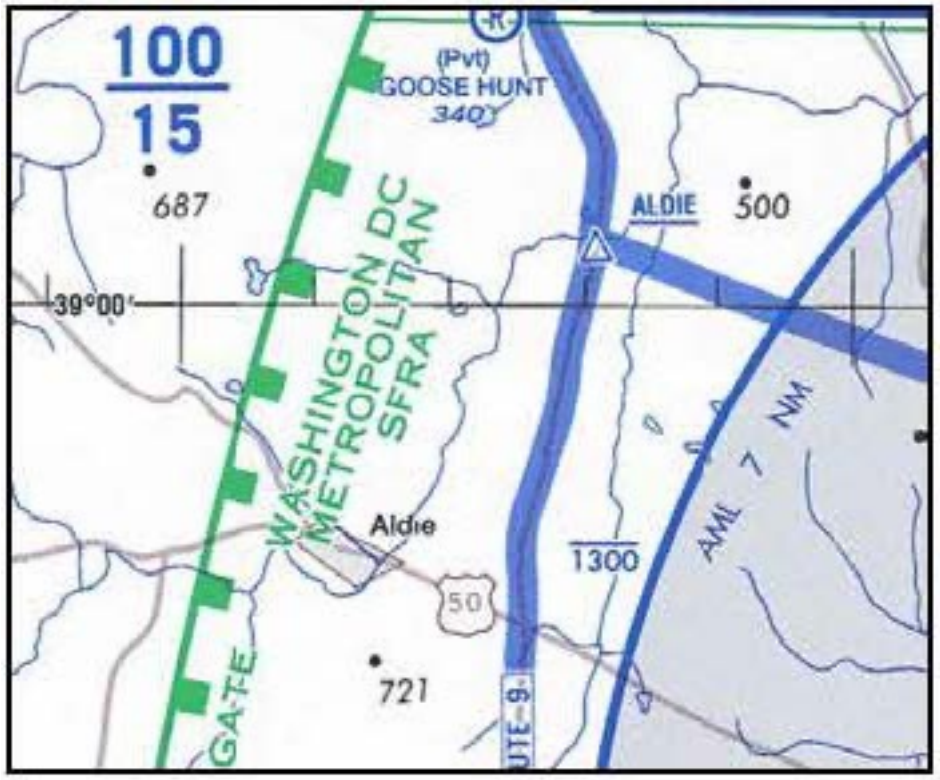


Just like Class C airspace but it doesn't meet the traffic requirements for Class C status.

Depicted with black line.

Other airspace

Special Air Traffic Rules (SATR) and Special Flight Rules Area (SFRA)



Washington DC area.

Each person operating an aircraft to, from, or within airspace designated as a SATR area or SFRA must adhere to the special air traffic rules set forth in 14 CFR Part 93, as applicable, unless otherwise authorized or required by ATC.

Other airspace

Weather Reconnaissance Area (WRA) and finally, Other Non-Charted Airspace Areas

Weather Reconnaissance Area (WRA) for hurricane operations.

Other Non-Charted Airspace Areas is used to separate IFR traffic from special operations. Has to do with altitude reservations and is most used to separate air-refueling operations.

- Stationary or Moving Altitude Reservation (ALTRV)
- ATC ASSIGNED AIRSPACE.

Thanks For Attending!

Other presentations by Captain Tom

FAAST
FAA SAFETY TEAM

Hi

Tom Rogers, ATP, CFI-AI-MEI Since 1976
NAFI Master CFI
FaaSTeam Representative

NAFI Master