

Airspace

Private Pilot Ground Lesson 4

Relevant FARs

CFR § 61.105(b) - Aeronautical Knowledge, Required Areas
Area
(1) Applicable Federal Aviation Regulations of this chapter that relate to private pilot privileges, limitations, and flight operations;
(2) Accident reporting requirements of the National Transportation Safety Board;
(3) Use of the applicable portions of the “Aeronautical Information Manual” and FAA advisory circulars;
(4) Use of aeronautical charts for VFR navigation using pilotage, dead reckoning, and navigation systems;
(5) Radio communication procedures;
(6) Recognition of critical weather situations from the ground and in flight, windshear avoidance, and the procurement and use of aeronautical weather reports and forecasts;
(7) Safe and efficient operation of aircraft, including collision avoidance, and recognition and avoidance of wake turbulence;
(8) Effects of density altitude on takeoff and climb performance;
(9) Weight and balance computations;
(10) Principles of aerodynamics, powerplants, and aircraft systems;
(11) Stall awareness, spin entry, spins, and spin recovery techniques for the airplane and glider category ratings;
(12) Aeronautical decision making and judgment; and
(13) Preflight action that includes - <ul style="list-style-type: none">(i) How to obtain information on runway lengths at airports of intended use, data on takeoff and landing distances, weather reports and forecasts, and fuel requirements; and(ii) How to plan for alternatives if the planned flight cannot be completed or delays are encountered.

Relevant ACS

I. Preflight Preparation

Task	<i>E. National Airspace System</i>
References	14 CFR parts 71, 91, 93; FAA-H-8083-2; Navigation Charts; AIM
Objective	To determine that the applicant exhibits satisfactory knowledge, risk management, and skills associated with the National Airspace System (NAS) operating under VFR as a private pilot.
Knowledge	The applicant demonstrates understanding of:
<i>PA.I.E.K1</i>	Types of airspace/airspace classes and associated requirements and limitations.
<i>PA.I.E.K2</i>	Charting symbology.
<i>PA.I.E.K3</i>	Special use airspace (SUA), special flight rules areas (SFRA), temporary flight restrictions (TFR), and other airspace areas.
Risk Management	The applicant demonstrates the ability to identify, assess and mitigate risks, encompassing:
<i>PA.I.E.R1</i>	Various classes and types of airspace.
Skills	The applicant demonstrates the ability to:
<i>PA.I.E.S1</i>	Identify and comply with the requirements for basic VFR weather minimums and flying in particular classes of airspace.
<i>PA.I.E.S2</i>	Correctly identify airspace and operate in accordance with associated communication and equipment requirements.
<i>PA.I.E.S3</i>	Identify the requirements for operating in SUA or within a TFR. Identify and comply with SATR and SFRA operations, if applicable.



Reading

- PHAK 15
- AIM 3
- FAR 91.126 – 91.143
- VFR Chart Legend

Class A Airspace

- From 18,000 MSL – 60,000 MSL
- Requires clearance and an IFR Flight Plan
- Everyone is instrument rated
- 18,000 is where the "flight levels" begin, FL180
- Above FL180, the altimeter is set to standard, 29.92
- VFR Minimums: NONE, IFR only

Class B Airspace

- Large Airports
- Uniquely shaped, by solid **blue** lines
- Floors and ceilings in MSL Includes
- “Mode C” veil 30NM from primary airport, SFC – 10,000ft
- Requires
 - Two-way communications
 - MODE C transponder
 - ATC clearance
 - At least a PPL (or student certificate with the proper endorsements)
- VFR Minimums: 1 SM visibility and clear of clouds (1 COC)



Class C Airspace

- Large but less busy airports Solid magenta lines
- Extends laterally for 5NM, vertically 4000ft AGS (MSL given)
- Shelf Area – Laterally to 10NM, from 1200-4000ft
- Outer area – 20NM, recommended (not required) to contact ATC
- Requires
 - Two-way communication
 - Mode C Transponder when in or above
- If in secondary airport still must communicate with primary ATC
- VFR Minimums: 3 SM and 1,000' above 500' below 2,000' horizontally (3 152)



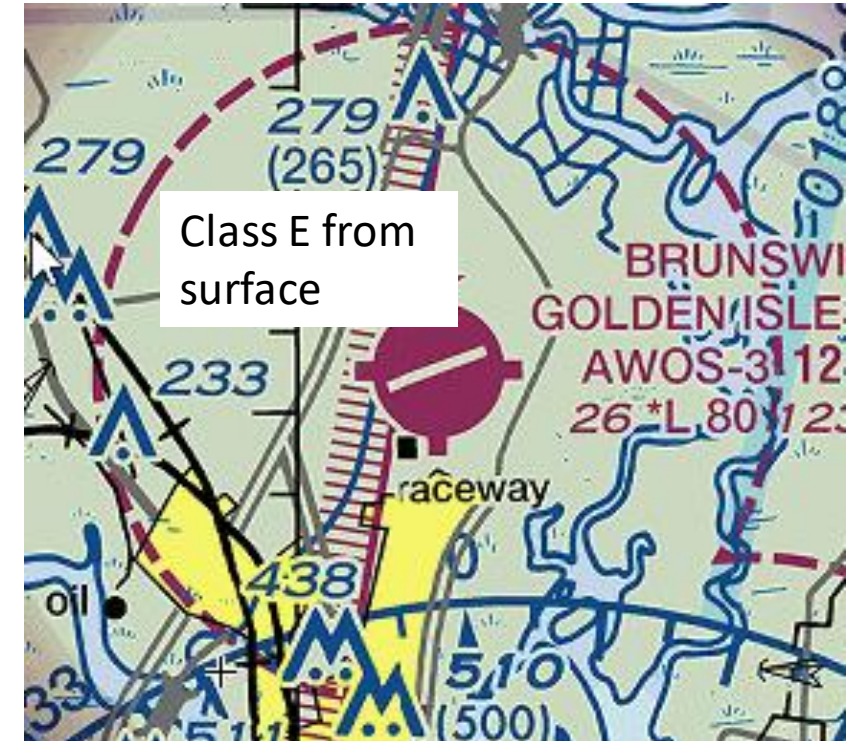
Class D Airspace

- Only exists when tower is operational
- **Blue** dashed line circle radius 5 SM/4.4NM 2,500ft AGL, MSL given in hundreds
- Requires
 - Two-way communication (ATC only needs to readback tail number)
- VFR Minimums: 3 SM and 1,000' above 500' below 2,000' horizontally (3 152)



Class E Airspace

- Protect federal airways
- Begin at 1200ft AGL and extend 4nm or 4.5° on either side, upper limit is 17,999ft MSL (then Class A) then again at 60,000ft to space
- Inside areas surrounded by magenta dashed line E goes to surface
- Inside fuzzy magenta vignette Class E goes from surface to 700ft AGL
- Requires
 - Nothing; no communication but technically still controlled airspace
- VFR Minimums <10,000' MSL: 3 SM and 1,000' above 500' below 2,000' horizontally (3 152)
- 10,000' MSL and higher: 5 SM and 1,000' above 1000' below 1 SM horizontally (5 111)



Class E from
700' AGL

Class G Airspace

- Uncontrolled
- Can be as high as 14,500 MSL unless specified but this is rare and is usually 1,200 AGL
- Requires
 - Nothing
- VFR Minimums:

Class G	≤ 1,200' AGL	Day	3 SM	Clear of clouds	1 COC
		Night	1 SM	1,000' above 500' below 2,000' horizontally	1 152 at night
	> 1,200' AGL and < 10,000' MSL	Day	3 SM		3 152
		Night	1 SM		1 152 at night
	> 1,200' AGL and > 10,000' MSL		5 SM	1,000' above 1,000' below 1 SM horizontally	5 111


Charting Symbolology

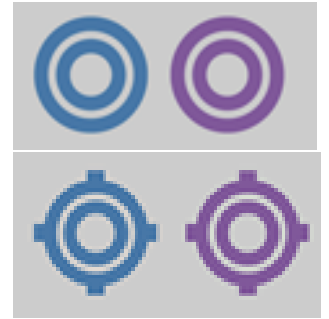
- **Latitude** – Lines are always 60nmi apart
- **Longitude** – Distance between them varies
- **Blue** for controlled airports **Magenta** for uncontrolled airports

No public services	Fuel available from 1000-1600LT	Private/restricted
		

- Hard-surfaced >1,500ft long shown with runway symbol
 - Less than 8,069ft airport symbol shown in circle otherwise no circle

Charting Symbolology

- **Military Airports** – A circle in a circle , require emergency or permission
 - Joint use has tick marks , large joint use are depicted as civil airports
- **Abandoned airports** – if >3,000ft 
- **Data grouping** – Name, Identifier in parentheses, elevation above MS, length of longest runway in hundreds of feet
 - “L” – surface lighting sunset to sunrise
 - “*L” – Lighting is pilot controlled
 - “C” – for CTAF
 - – Part time tower
 - “CT” – control tower
 - “ATIS” – for ATIS
 - “U” or “###.##” – Unicom frequency
 - “R” – Right traffic non-standard traffic pattern



VFR Charts

- MEF (Maximum Elevation Figure) in hundreds of feet Highest feature in area
- Dot shows location for 200ft obstacles near airport or higher than terrain
- VFR Checkpoints – ATC will know these for location reporting
 - Black symbol or flags = prominent structure
 - Blue = VOR
 - Magenta = Uncontrolled airport



Special Airspace

- **Special Use Airspace** – Airspace wherein activities must be confined because of their nature, or wherein limitations are imposed
- **Special Flight Rules Areas** – A region in which the normal regulations of flight do not apply and special training may be required; like around Washington D.C.

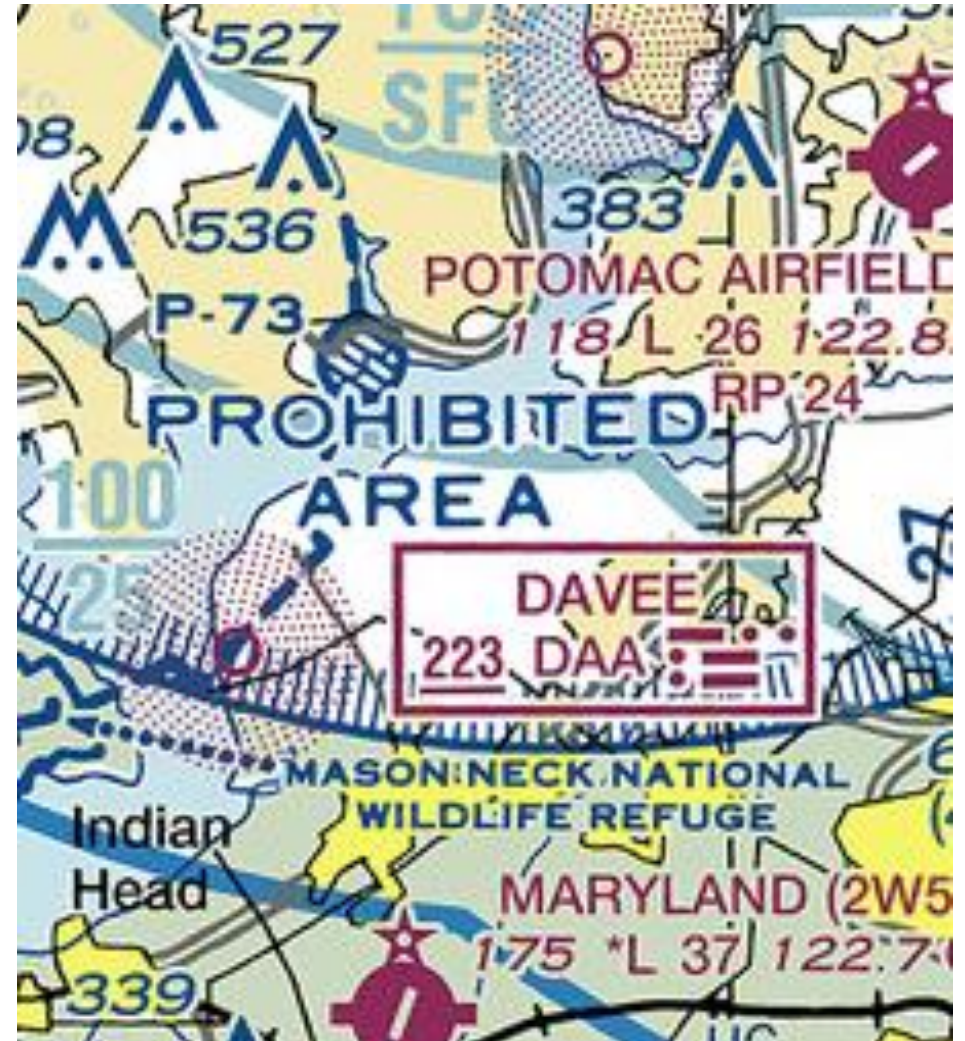
Temporary Flight Restriction (TFR)

- Temporarily restricted access to certain designated areas of airspace, need to get clearance from ATC if you need to fly through them



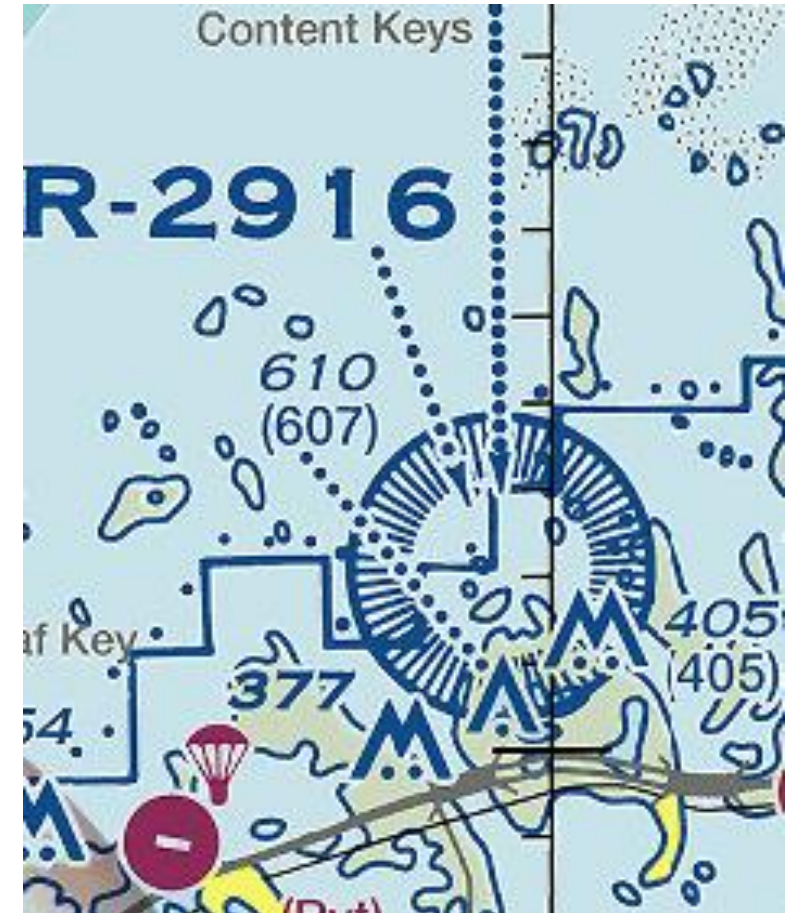
Prohibited Areas

- No entry under any circumstance
- Area Marked with **BLUE** hash and P following number



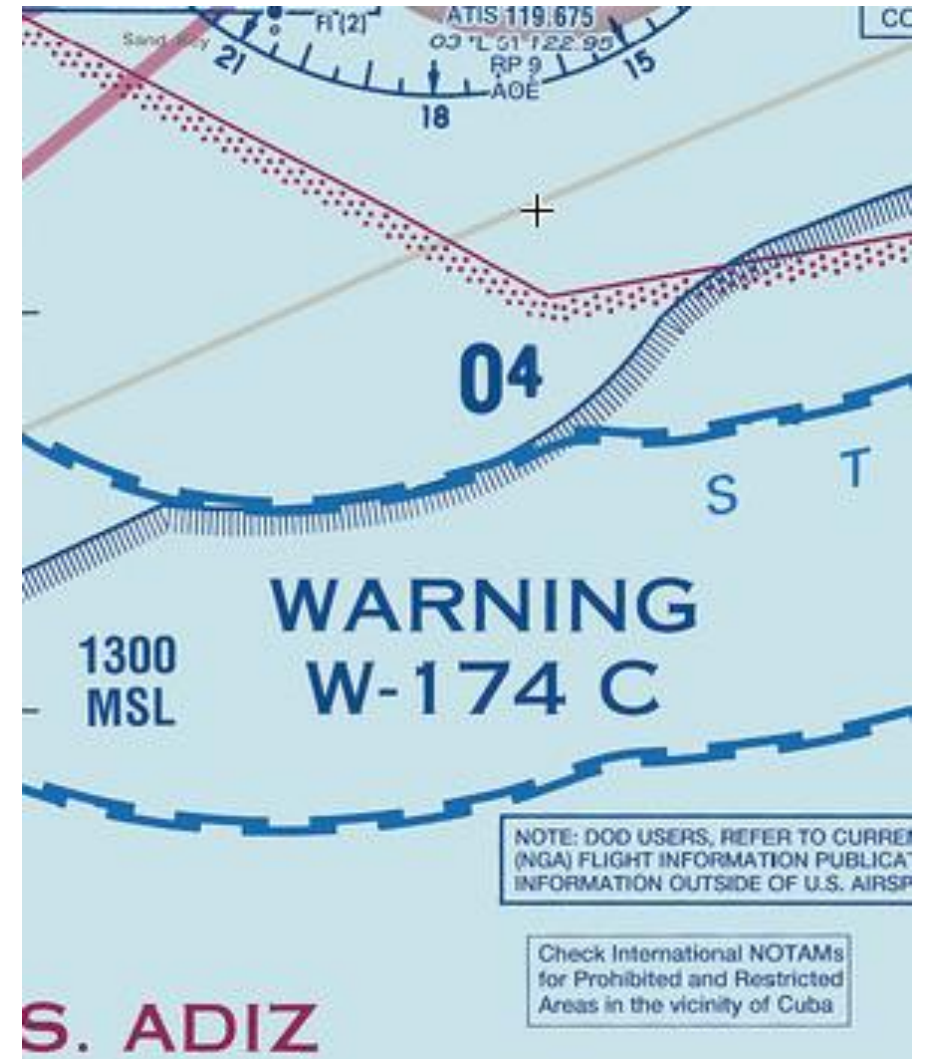
Restricted Areas

- Can fly through with permission, more details available on the sectional chart
- Areas Marked with **BLUE** hash and R following number



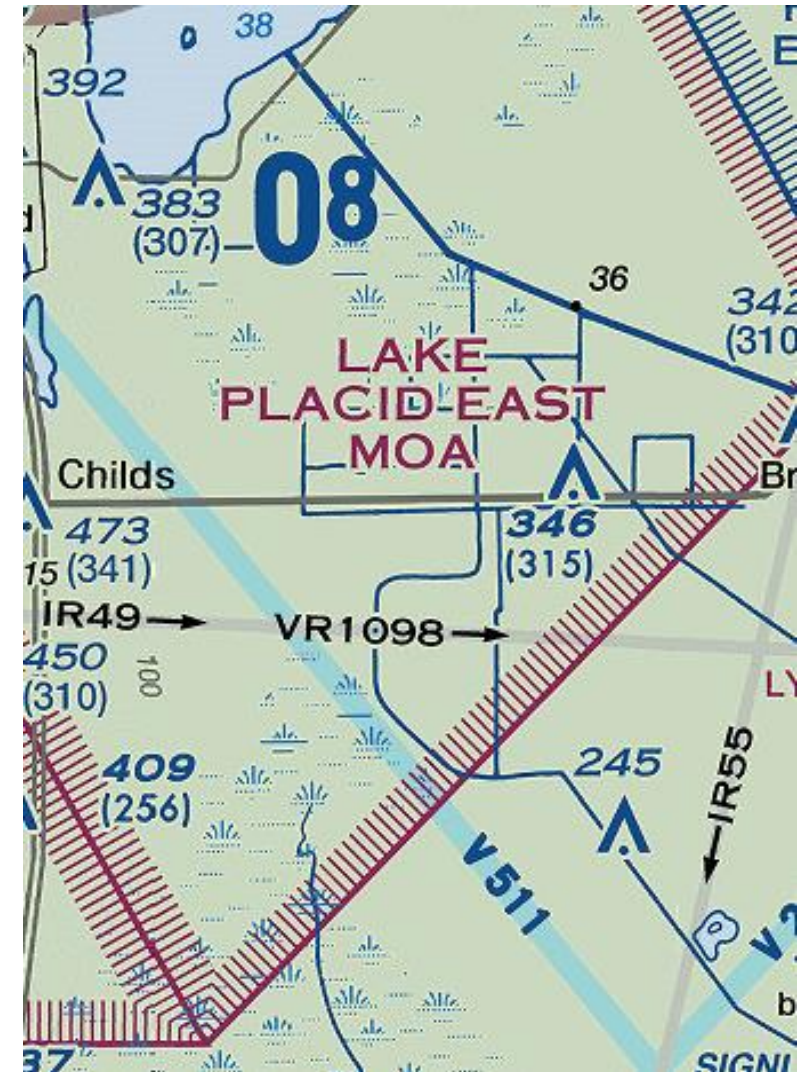
Warning Areas

- Use at own risk
(international waters),
unusual or invisible
risks



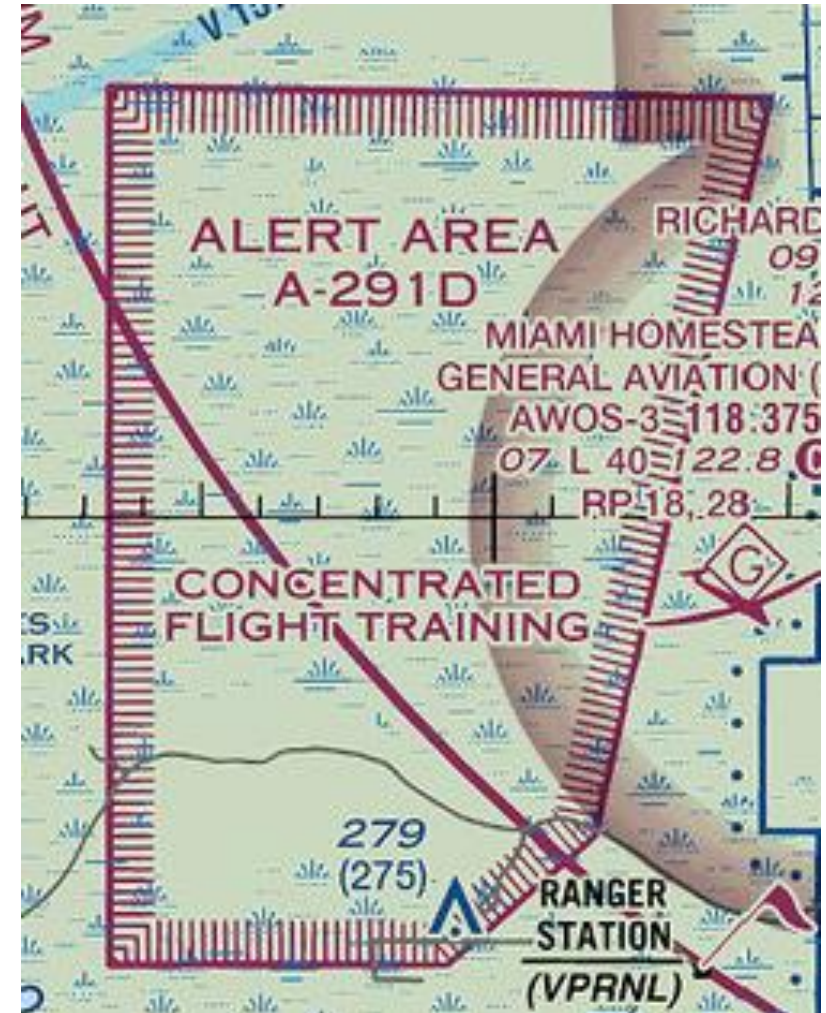
Military Operations Areas

- Marked with **MAGENTA** hash and the name
- No special permission required but can be dangerous



Alert Areas

- Marked with **MAGENTA** hash and a following number
- High volume training, no special permission required



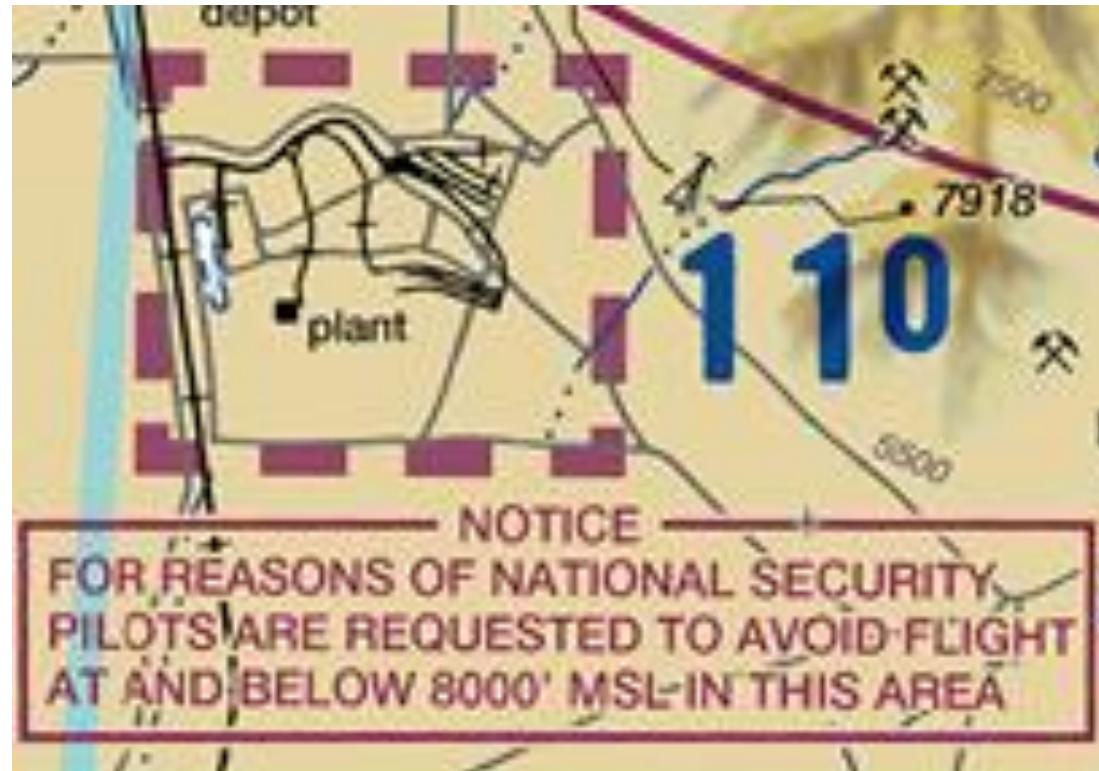
Military Training Routes

- IR = instrument, VR = visual, number indicates altitudes
- Four digits = <1500' AGL Three digits = >1500'AGL



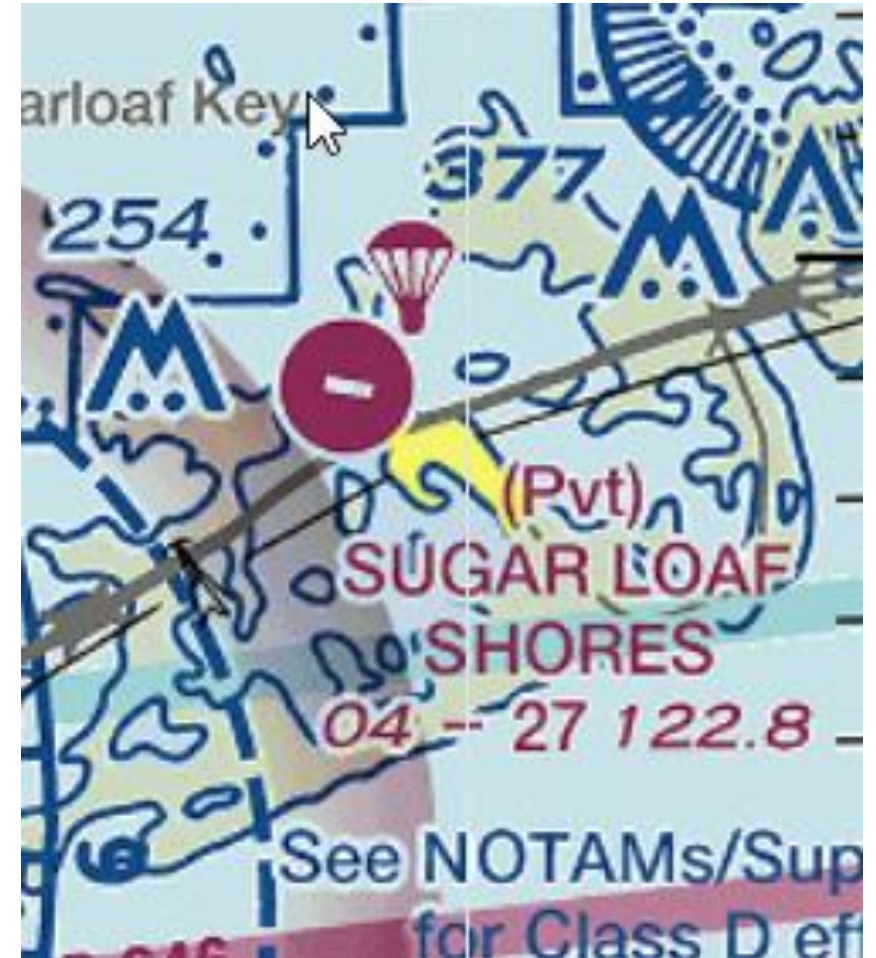
National Security Areas

- Powerplants, ammunition Voluntarily avoid



Parachute Jumping Areas

- High activity of skydivers



Victor Airways

- Class E from 1,200 AGL - 18,000 AGL; point to point VOR navigation; like “sky highways”



VFR Flyways

- General flight path to SFC, no ATC clearance; helps avoid busy airspace



VFR Corridors

- “Tunnel” through B airspace, no ATC clearance



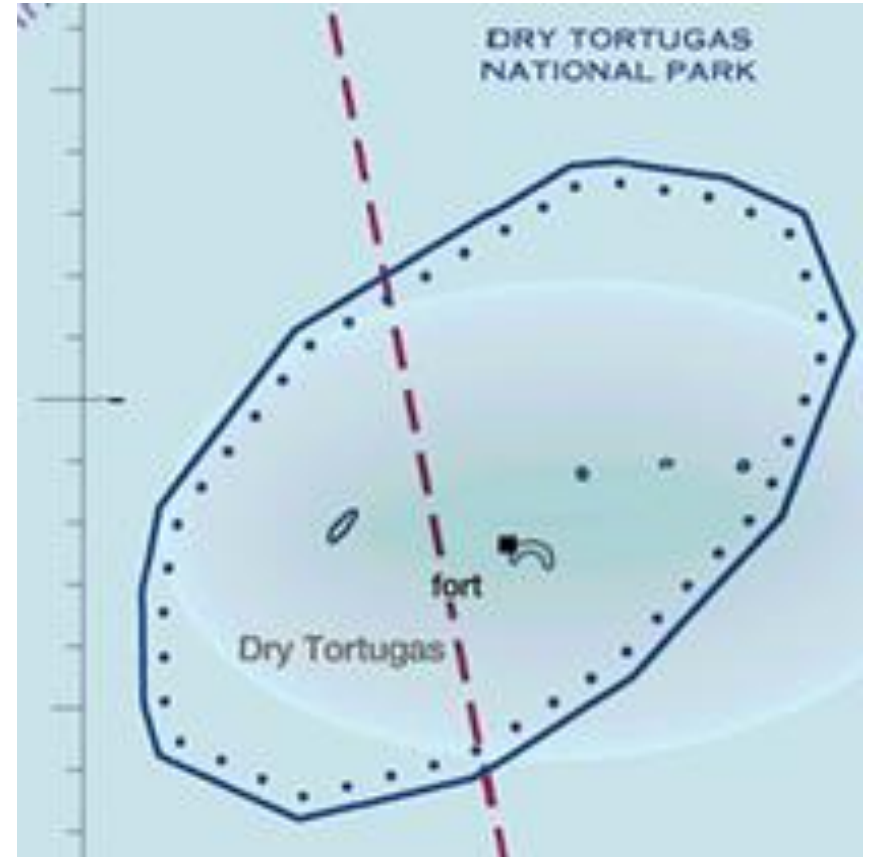
VFR Transition Routes

- Specific course at specific altitude; NEEDS ATC CLEARANCE



Special Conservation Areas

- Protect national parks, blue line with dots inside, stay $>2000'$ AGL



Terminal Radar Service Areas

- Voluntary radar service when requested;
gray line



Speed Limits

- No faster than the speed of sound (Mach 1)
- **250** knots below 10000' MSL
- **200** KIAS under Class B, in corridor, or within 4NM of Class C or D

Cloud Clearance Review

Airspace	Visibility Requirement		Cloud Clearance Requirement	Mnemonic
Class A	None		None	IFR Only
Class B	3 SM		Clear of clouds	3 COC
Class C	3 SM		1,000' above	3 152
Class D	3 SM		500' below	
Class E	< 10,000 MSL	3 SM	2,000' horizontally	5 111
	≥ 10,000 MSL	5 SM	1,000' above 1,000' below 1 SM horizontally	
Class G	≤ 1,200' AGL	Day	3 SM	1 COC
		Night	1 SM	1 152 at night
	> 1,200' AGL and < 10,000' MSL	Day	3 SM	3 152
		Night	1 SM	1 152 at night
	> 1,200' AGL and > 10,000' MSL		5 SM 1,000' above 1,000' below 1 SM horizontally	5 111

Questions?