Area of Operation **II** - Task **K**

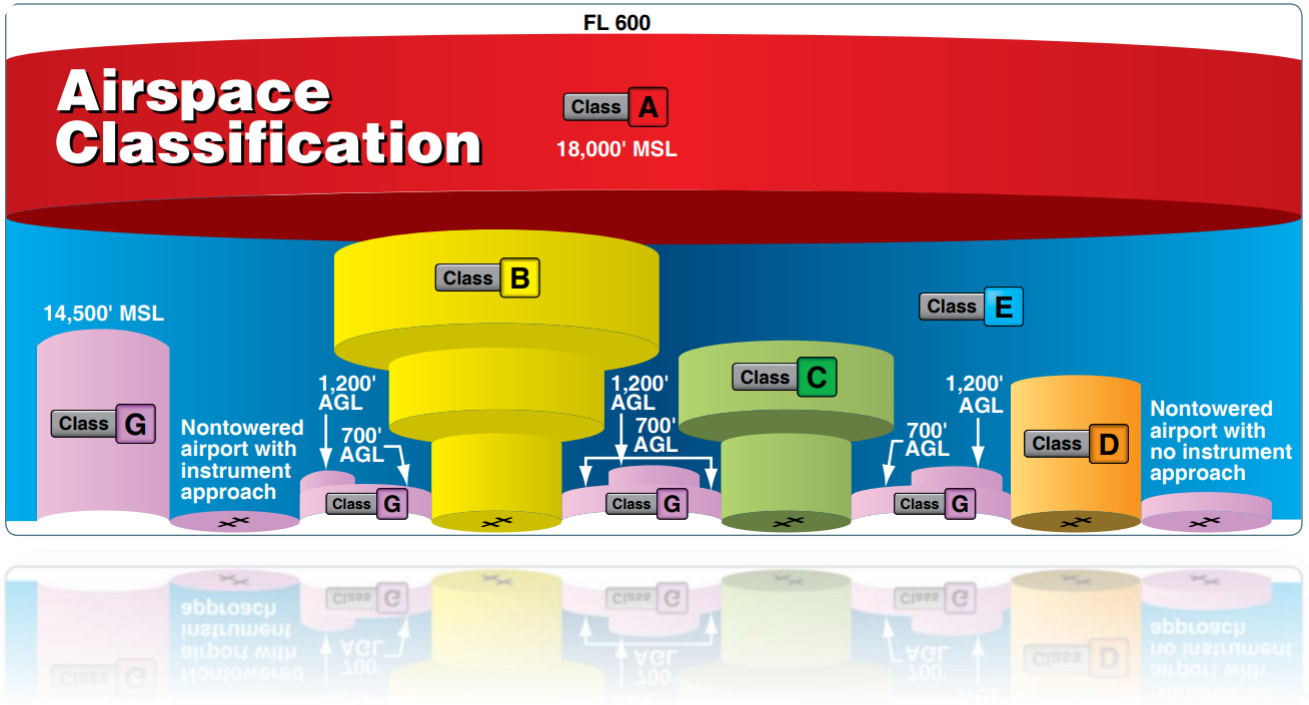
National Airspace System

Key References:
- 14 CFR Parts 71 and 91
- AIM and Navigational Charts
- Pilot's Handbook of Aeronautical Knowledge

Content

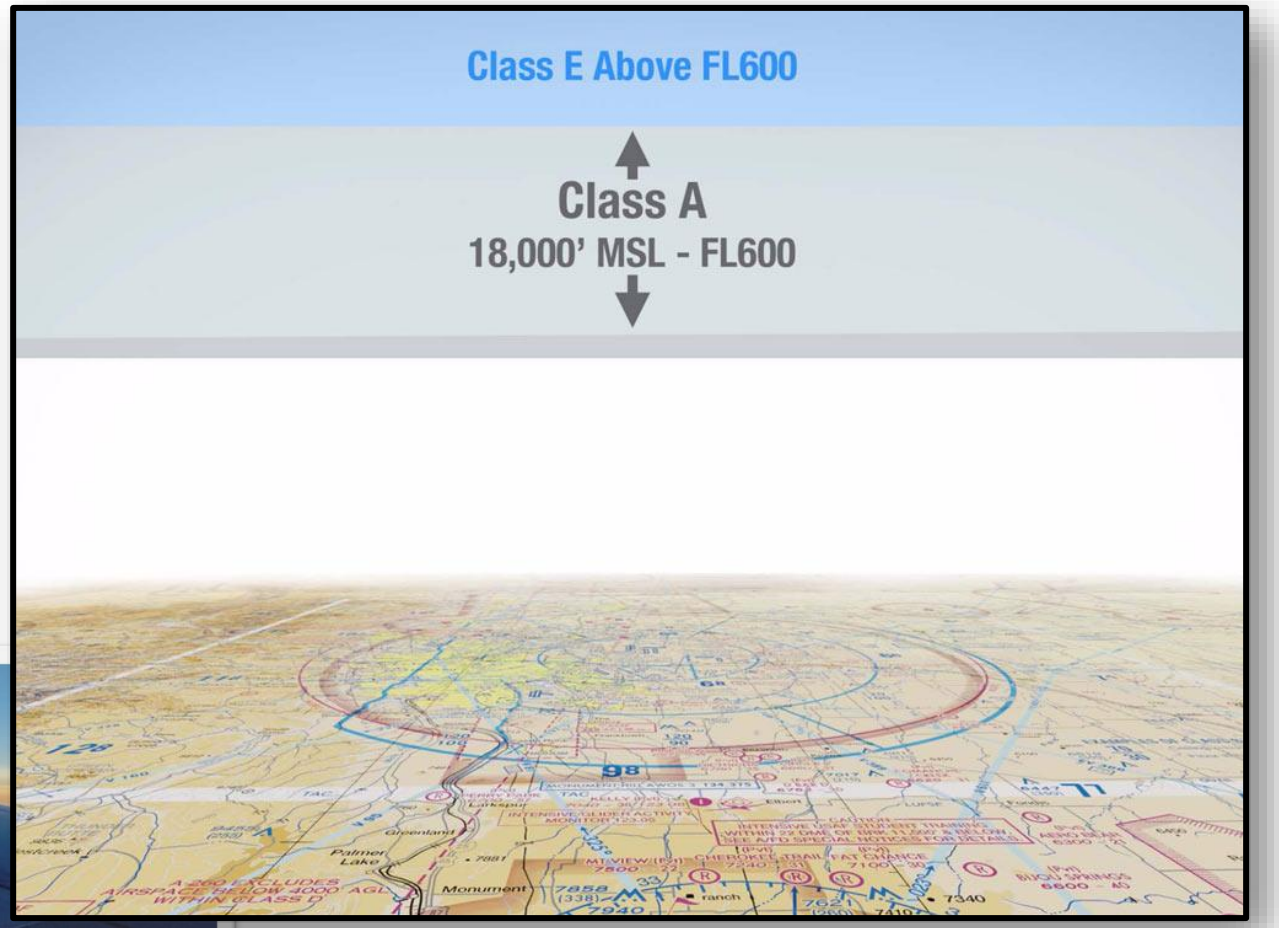
1. Introduction

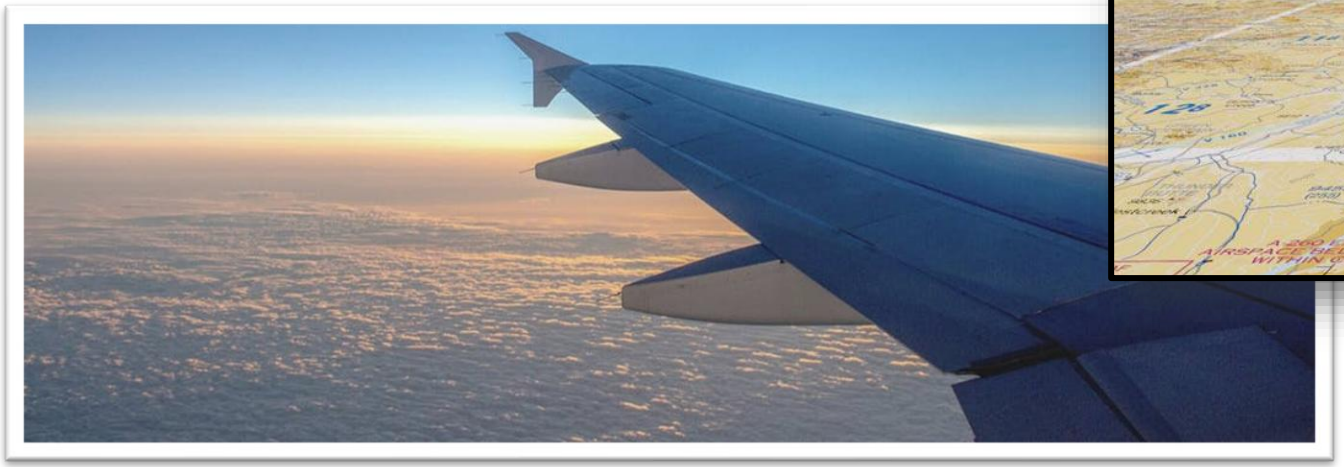
- **What**: Explain the different types of airspace and requirements to fly into them
- **Why**: Pilots must know where they are flying into, what is required, and what to avoid
- **Types of Airspace**
  - Regulatory
    - ✓ *Controlled (A, B, C, D, E)*
    - ✓ *Uncontrolled (G)*
    - ✓ *Some special use airspace*
      (e.g. Restricted areas)
  - Non-Regulatory (advisory in nature)
    - ✓ *Advisory in nature*
    - ✓ *Some special use airspace*
      (e.g. Warning areas)



2. Class A Airspace

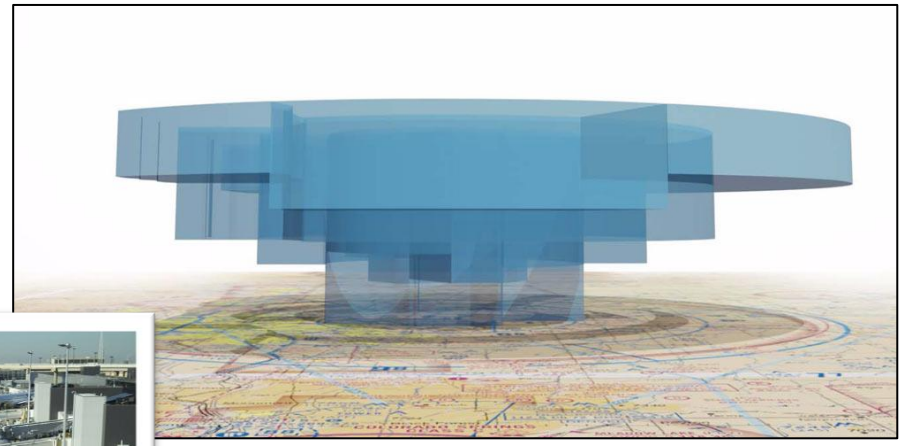
- Between 18,000ft MSL and ≤ FL600
- Only IFR operations allowed
  - ✓ *Aircraft equipped for IFR*
  - ✓ *Pilot must be Instrument rated and current*
  - ✓ *IFR Flight Plan*
  - ✓ *Contact with ATC*
- Once pilot reaches 18,000ft, turns altimeter setting to 29.92

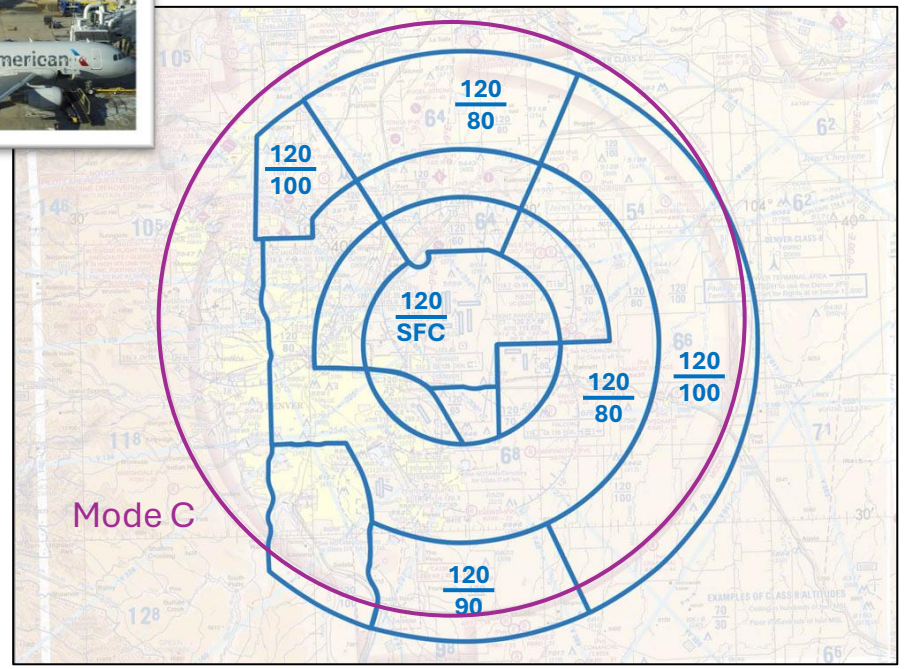




3. Class B Airspace

- From the Surface to 10,000ft MSL (several complex layers)
- Requires clearance to enter
- Designed to contain all instrument approaches inside
- Must be at least a Private Pilot
  - ✓ *Student/Recreational only w/ endorsement*
- Class B airports also defines the **Mode-C Veil**
  - 30nm out of primary airport, up to 10nm
  - Special requirements on equipment
- Services:
  - Basic radar services, sequencing, separation between ALL aircraft



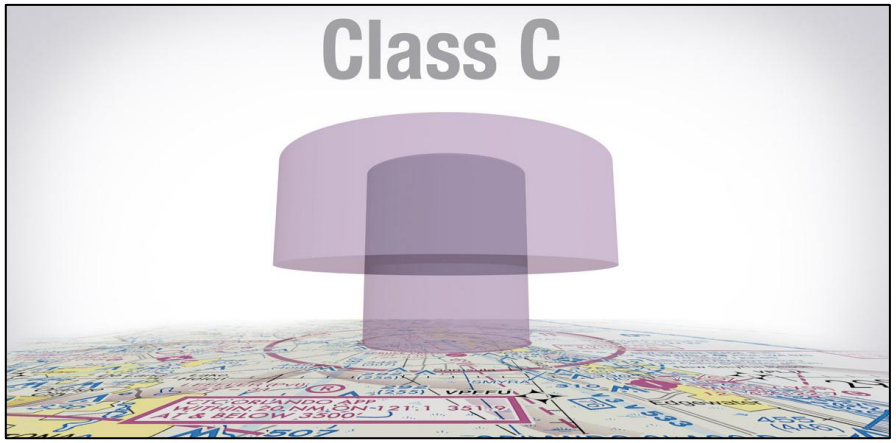


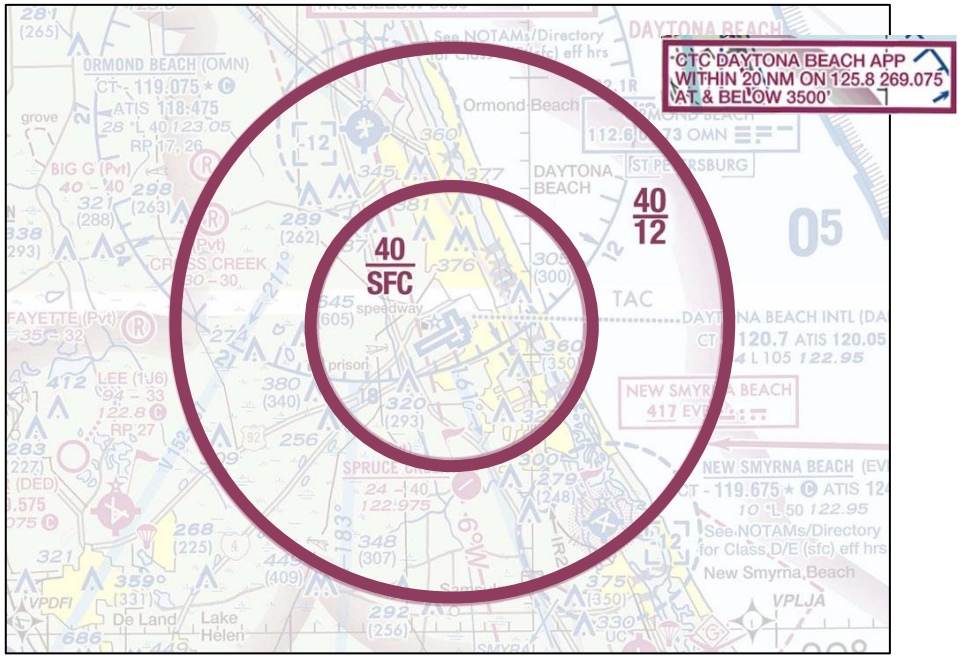
Weather Minimums (§91.155)

3 SM visibility, Clear of Clouds

4. Class C Airspace

- Upside down cake up to 4,000ft AGL
  - Inner ring: SFC to 4,000 AGL (5nm radius)
  - Outer ring: 1,200 MSL to 4,000 AGL (10nm radius)
  - ✓ *Note: altitudes are charted in MSL in the sectional*
- Requires establish communications with ATC
  - Contact Approach 20nm out
- Services:
  - Basic radar services, sequencing, separation VFR/IFR aircraft





(§91.155)
Weather Minimums

3-152

3sm visibility

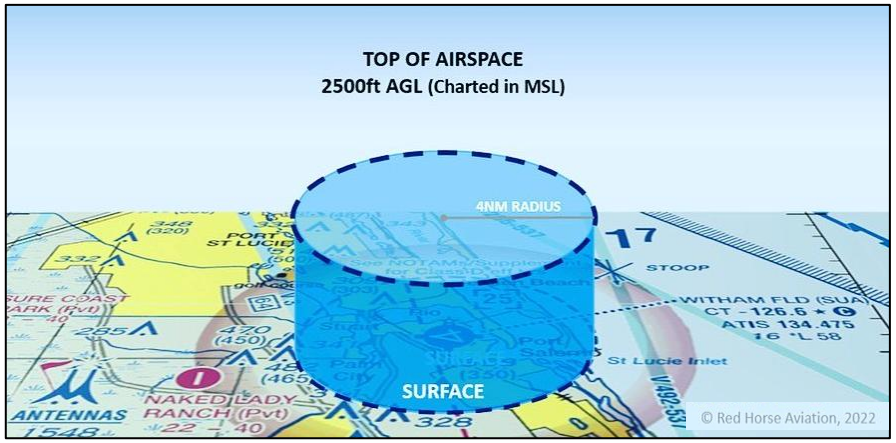
1000ft

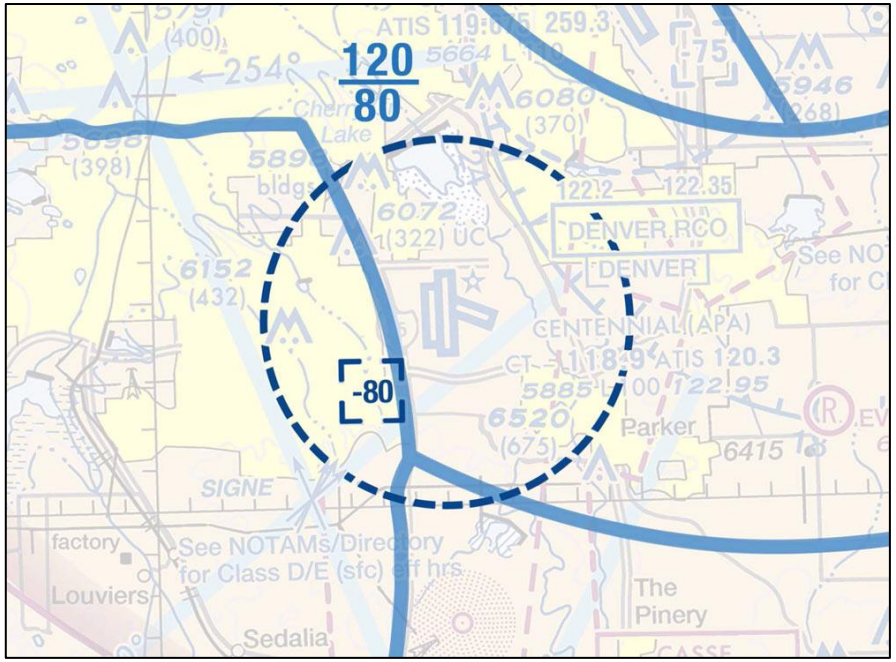
2000ft

500ft

5. Class D Airspace

- Surface to 2,500ft AGL, 4nm radius
  - Top altitude in MSL shown in a box (“29” = “2900ft MSL”)
  - If Altitude has a “-” then it means “up to but not including”
- Full or part-time control tower
  - When tower is closed, revert to Class E or G
- Requires establish communications with Tower
- Services:
  - Sequencing only





(§91.155)
Weather Minimums

3-152

3sm visibility

1000ft

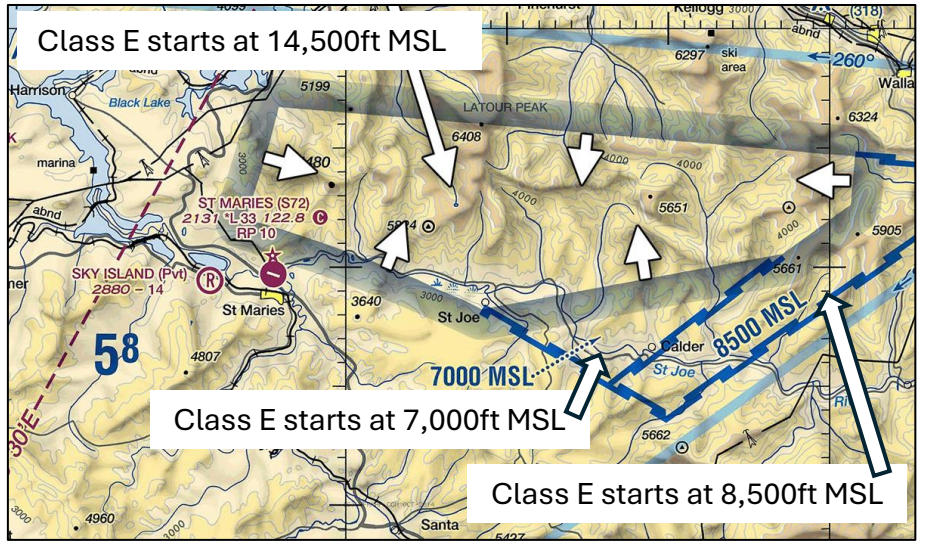
2000ft

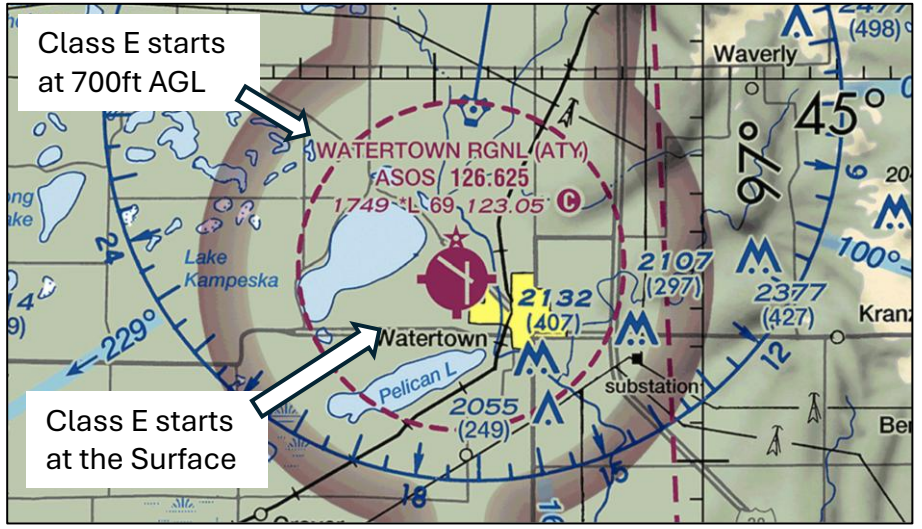
500ft

6. Class E Airspace

- All airspace above FL600
- Starts at 14,500ft MSL up to not including 18,000ft MSL
  - Floor can start at the Surface, 700ft AGL or 1200ft AGL

- Low airways (e.g. V-Airway) are Class E
  - 1200 AGL up to not including 18000ft MSL, 8nm wide





Weather Minimums
(§91.155)

≥10,000ft MSL — **5-111**
- 5sm visibility
- 1000ft above, 1000ft below, 1sm horizontal

<10,000ft MSL — **3-152**
- 3sm visibility
- 1000ft above, 500ft below, 2000ft horizontal

7. Class G Airspace

- Uncontrolled Airspace
- Anywhere not designed A, B, C, D or E
- Extends from the surface to the base of the overlying airspace
- ATC has no authority or control over Class G traffic

Weather Minimums

(§91.155)

>1200ft AGL

≥10,000ft MSL

5-111

- 5sm visibility
- 1000ft above, 1000ft below, 1sm horizontal

<10,000ft MSL

1-152

- 1sm visibility
- 1000ft above, 500ft below, 2000ft horizontal

3-152

- 3sm visibility
- 1000ft above, 500ft below, 2000ft horizontal

≤1200ft AGL

1-CoC

- 1sm visibility
- Clear of Clouds

3-152

- 3sm visibility
- 1000ft above, 500ft below, 2000ft horizontal

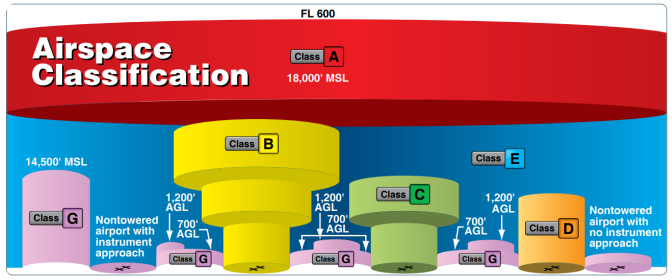
1-CoC

If traffic pattern

- 1sm visibility
- Clear of Clouds

8. Pilot and Aircraft Requirements

Class	Enter requirement	Equipment & Pilot requirements	FAR
A	• ATC clearance • IFR flight plan	• 2-way radio, Transponder (w/ alt reporting), ADS-B Out, IFR Equipped ✓ *Note: FAR 91.205 requires DME (or RNAV) ≥ FL240* • Instrument Rated pilot	§91.135
B	• ATC clearance	• 2-way radio, Transponder (w/ alt reporting), ADS-B Out • Private pilot (Student/Recreational pilot under exception)	§91.131
C	• Establish comms *(ideal 20nm out)*	• 2-way radio, Transponder (w/ alt), ADS-B Out	§91.130
D	• Establish comms	• 2-way radio	§91.129
E	• No communications required unless if flying IFR • Establish comms if airport has tower (within 4nm, ≤ 2500ft AGL)	See additional requirements	§91.127
G	• No communications required • Establish comms if airport has tower (within 4nm, ≤ 2500ft AGL)		§91.126



Transponder (Mode-C) and ADS-B Out Requirements in classes D, E, G (§91.215, §91.225)

- Above ceiling of class B and C airspace up to 10,000ft MSL
- Airspace ≥ 10,000ft MSL (excluding <2,500ft AGL) within US 48 states + DC
- Mode-C Veil: within 30nm from primary Class B airport (surface to 10,000ft MSL)
- *ADS-B only: Class E ≥3,000ft MSL over Gulf of Mex to 12nm from the US coast*

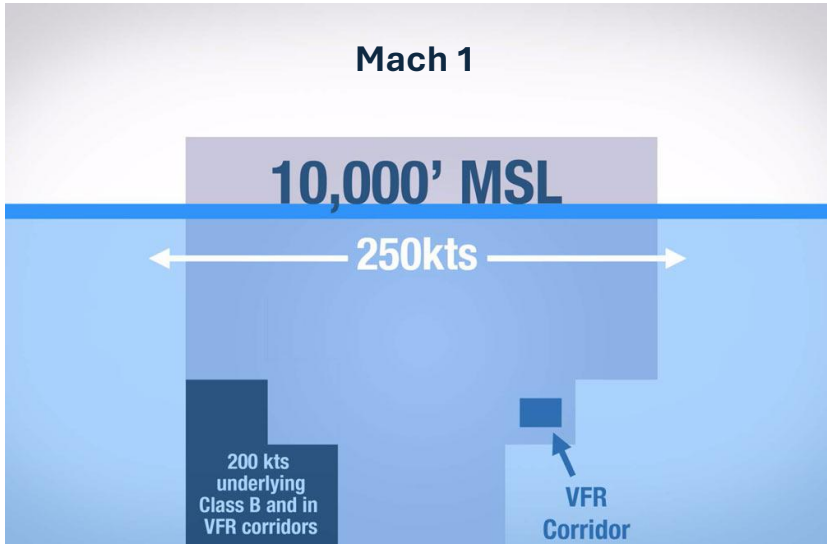
9. Special VFR

- **Regulated by FAR 91.157**
  - Clearance to operate under VFR with less than the VFR Weather Minimums
    - ✓ *For a controlled airport, this usually helpful when MVFR*
  - Weather minimum: **Clear-of-Clouds** and **≥1sm visibility**
  - Requires ATC clearance (requested by the pilot)
  - Valid <10,000ft MSL within lateral boundaries of the airport's controlled airspace
  - Between sunset/sunrise ➔ Pilot needs Instrument Rating and IFR-equipped aircraft
  - Prohibited at certain airports (Part 91 Appendix D section 3) ➔ "NO SVFR"

- **Flight Categories**
  - VFR: >3000' AGL and >5sm
  - MVFR: 1000' to 3000' AGL and/or 3-5sm
  - IFR: 500' to <1000' AGL and/or 1sm to <3sm
  - LIFR: <500' AGL and/or <1sm

10. Airspeed Limitations

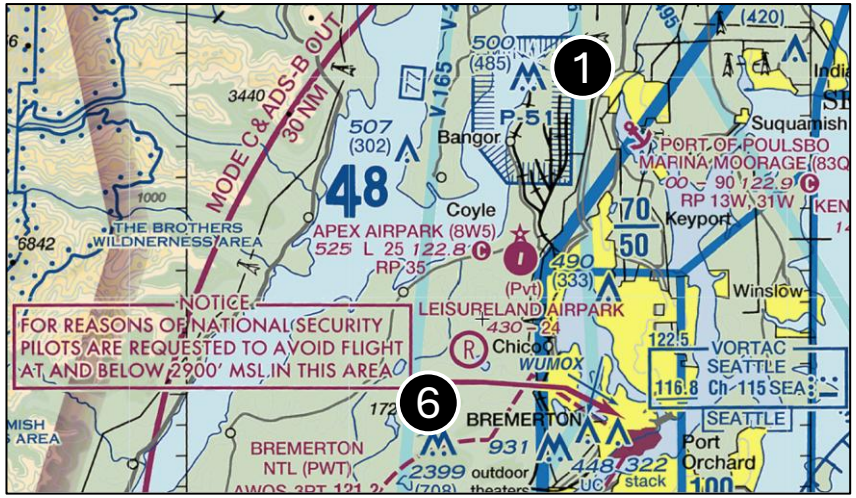
- **Defined by FAR §91.117**
  - 200 kias ➔ At/below 2500ft AGL within 4nm of primary class C/D airport
  - 200 kias ➔ Underneath class B airspace or in a VFR corridor
  - 250 kias ➔ Below 10,000ft MSL
  - Mach 1 ➔ At/above 10,000ft MSL (Civil aircraft) (§91.817)
- If the aircraft's min safe speed is greater than the max airspeed above ➔ can operate at their min safe speed

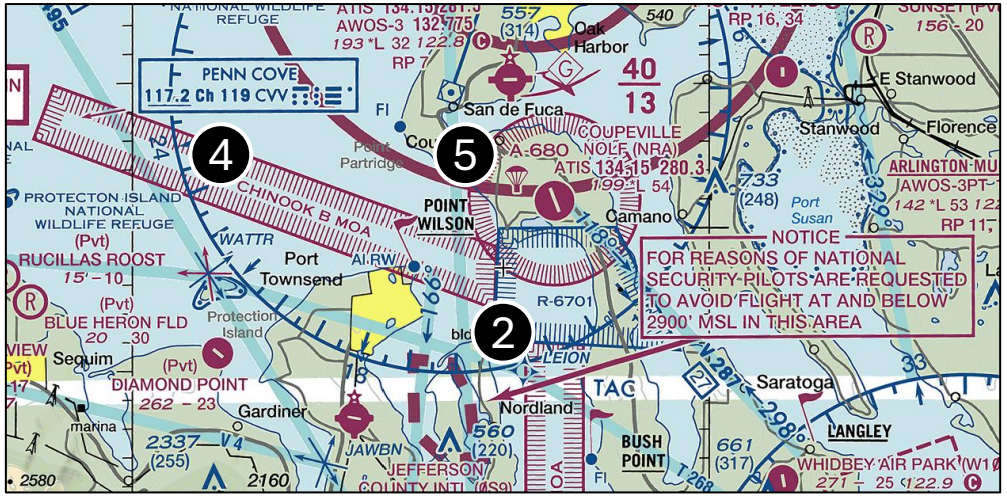


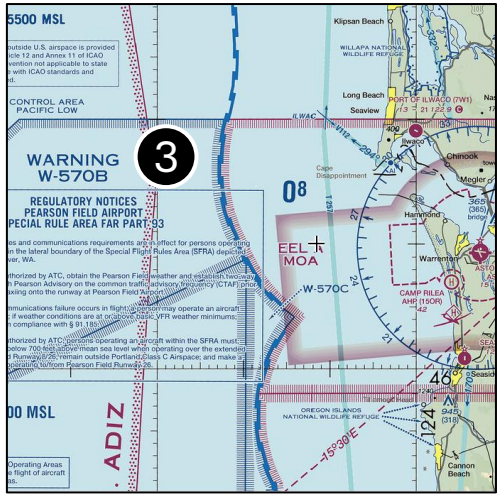
11. Special Use Airspaces

AIM 3-4

1. **Prohibited Areas** ➔ Flight is prohibited for security or other reasons associated with national welfare
2. **Restricted Areas** ➔ Not prohibited, but subject to restrictions (active/inactive) - e.g. aerial gunnery, artillery firing, etc
3. **Warning Areas** ➔ Extend from 3 nm outward from coasts with potentially hazardous activity
4. **Military Operations Areas (MOAs)** ➔ Separate military training activity from IFR traffic. No restriction against VFR
5. **Alert Areas** ➔ Alert pilots to high volumes of training or unusual activity
   - **Controlled Firing Areas** ➔ Activities hazardous to aircraft; not chartered (suspended when an aircraft is approaching)
6. **National Security Area** ➔ Requirement for increased security and safety of ground facilities





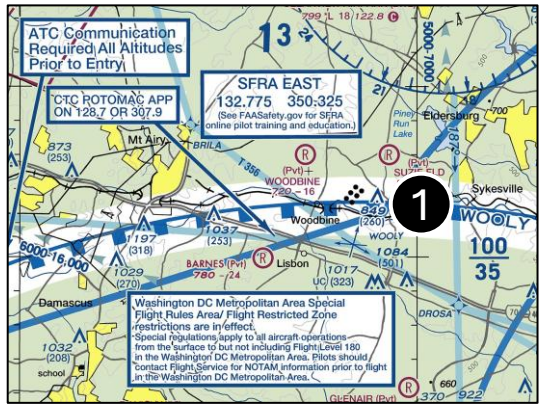


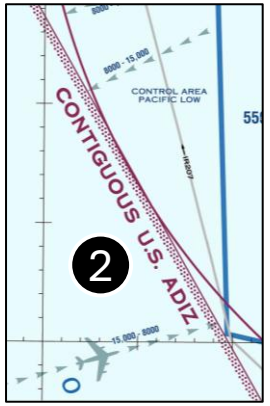
12. Other Airspaces

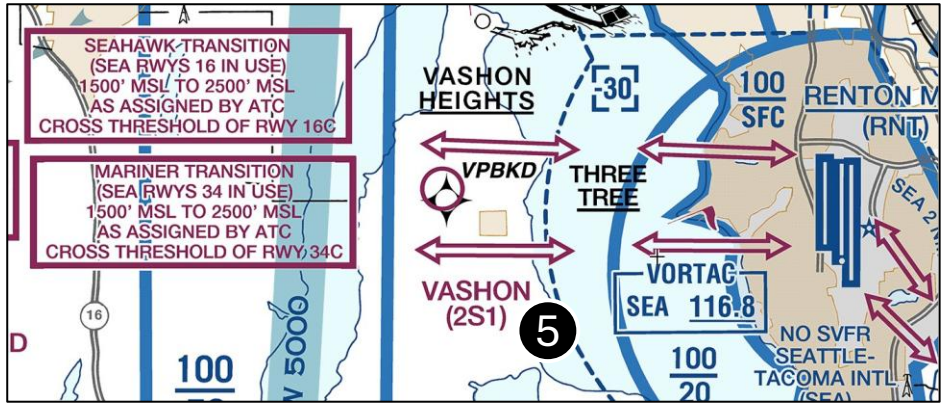
AIM 3-5

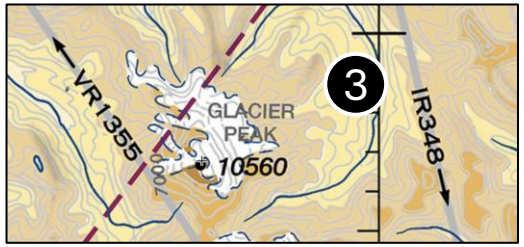
- **Temporary Flight Restrictions (TFR)** ➔ Defined by FDC NOTAM (use foreflight to map it)

1. **Special Flight Rules Area (SFRA)** and **Special Air Traffic Rules (SATR)** ➔ Governed by their specific rules (Part 93), e.g. DC
2. **Air Defense Identification Zone (ADIZ)** ➔ Usually at the borders, aircraft identification is required
   - ✓ *Needs transponder (w/ altitude), 2-way radio, filed IFR or Defense VFR (DVFR) flight plan, depart w/ 5min*
3. **Military Training Route (MTR)** ➔ IR (instrument) or VR (VFR), usually <10,000ft and speeds above 250kias
   - ✓ *If 4 digits (e.g. VR1355) then at/below 1500ft AGL. If 3 digits (e.g. IR342) then any altitude*
4. **Parachute Jump Aircraft Operations** ➔ Area with high activity of parachuting
5. **Published VFR Route** ➔ For transitioning around, under, or through complex airspace
6. **Terminal Radar Service Area (TRSA)** ➔ Areas where pilots can receive radar services



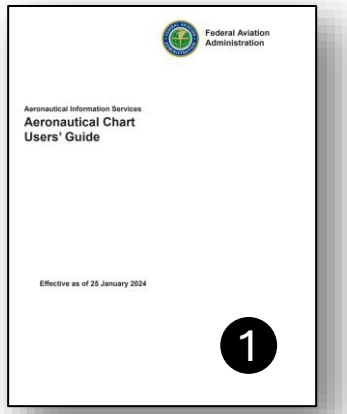


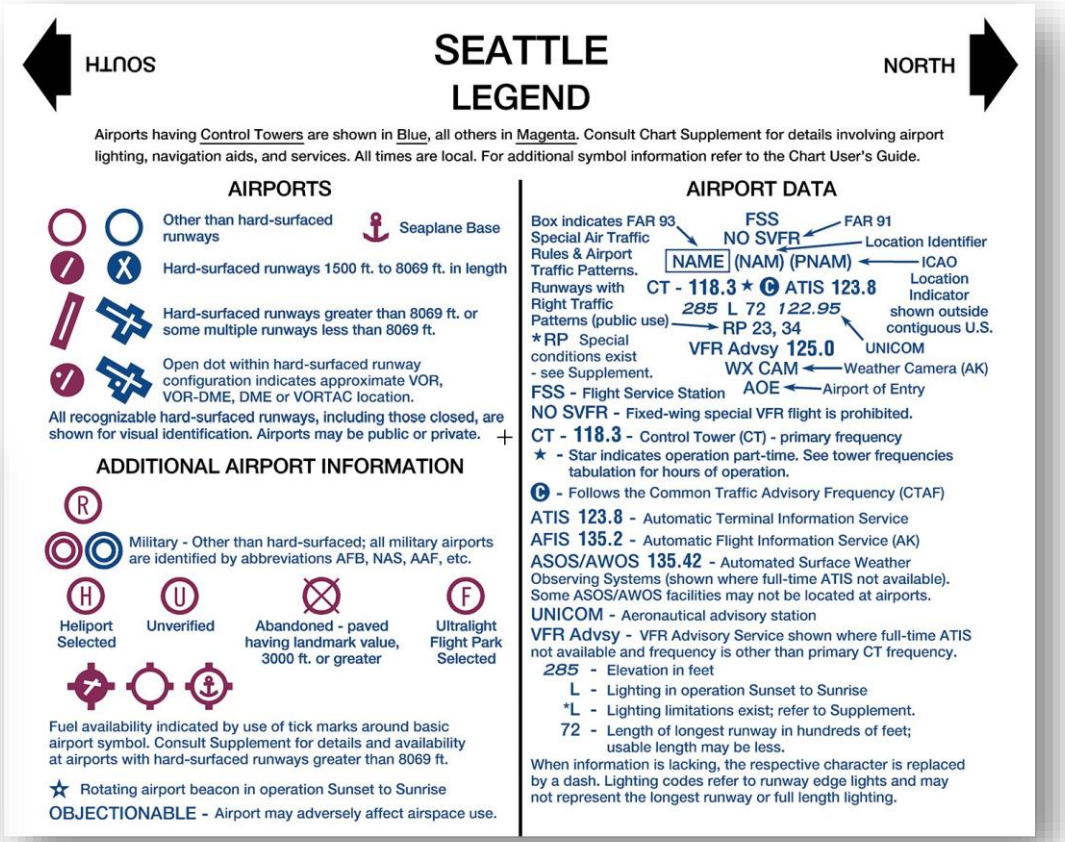


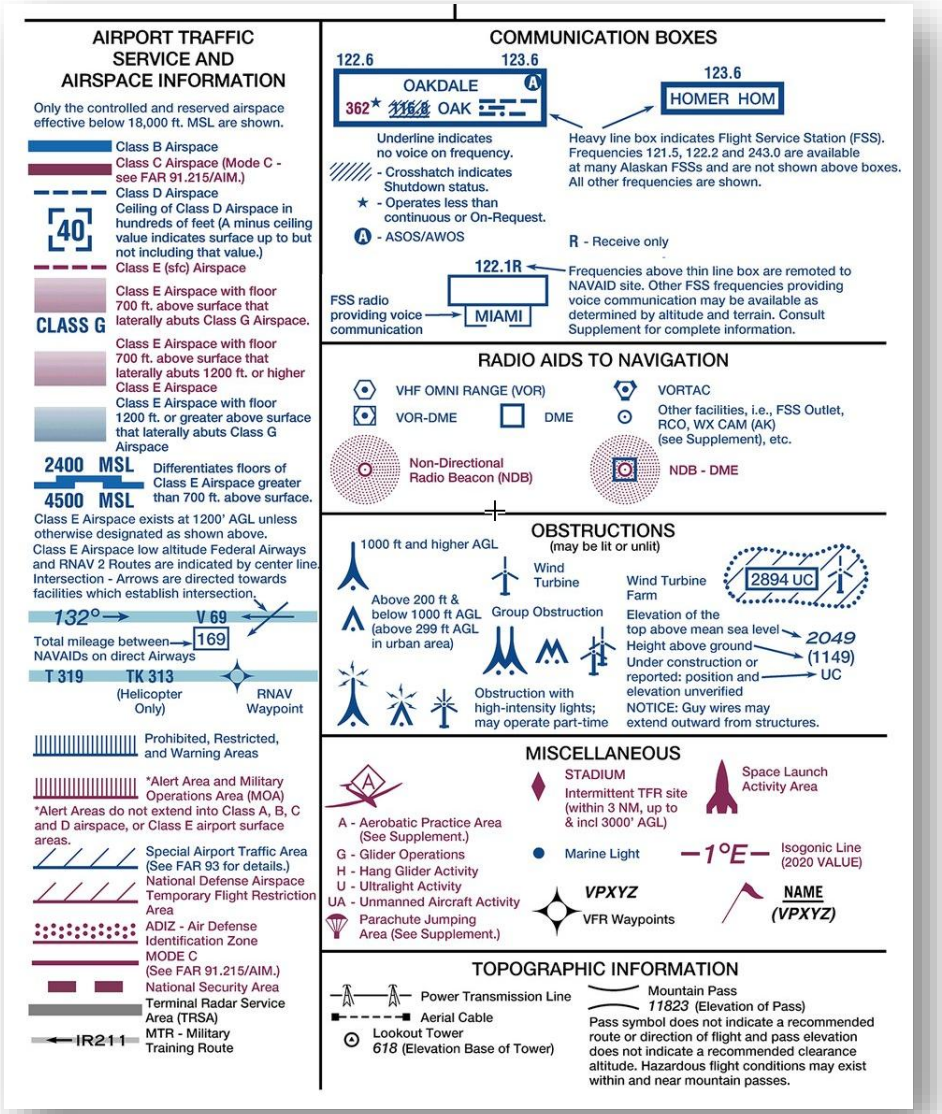


13. Aeronautical Charts

1. User guide: https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/aero_guide/
   - Sectional is updated every 56 days
   - Legend found in the side of the paper chart (or “Documents” in Foreflight)







Questions?