UAS Standards, Reg, Law & Exam

FAA Regulations: Part 107

Lesson 2b – Airspace Classification

Airspace Classification Objectives

- To determine that the applicant is knowledgeable in airspace classification
- To determine that the applicant is knowledgeable of airspace operational requirements

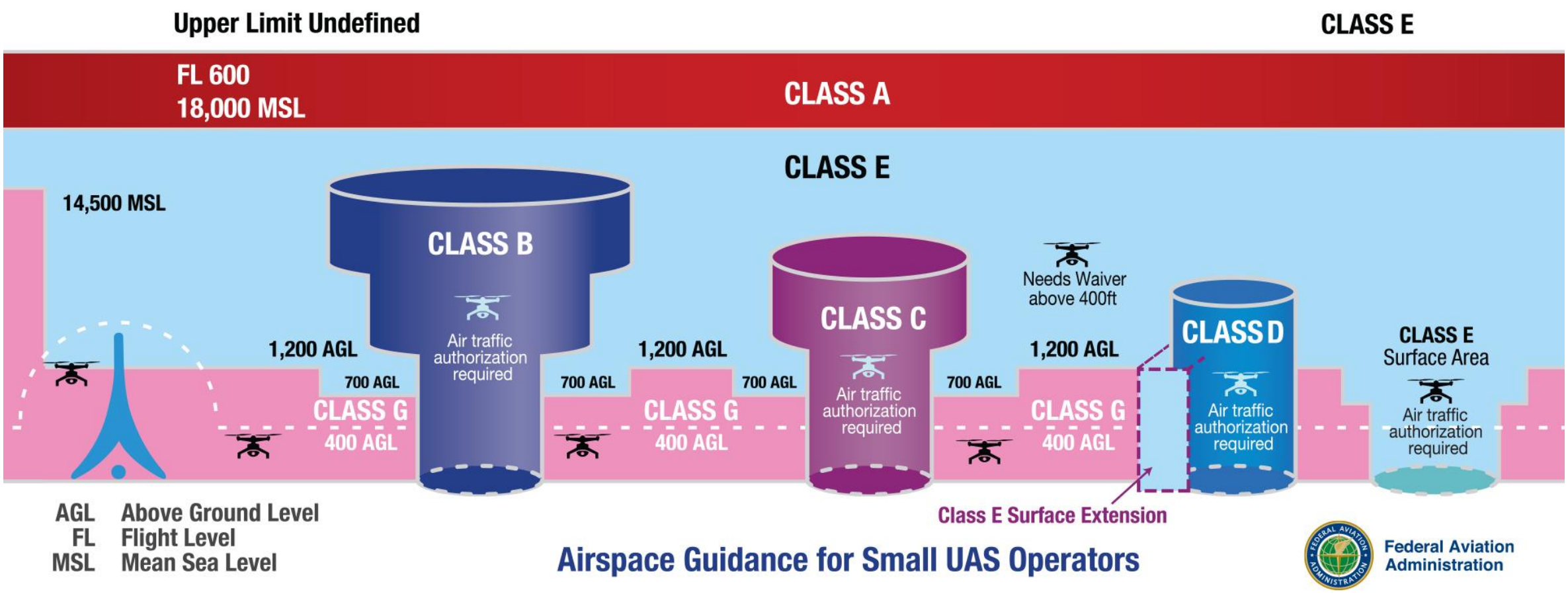
Airspace Classification – The National Airspace System (NAS)

- General Airspace
  - Class A controlled airspace
  - Class B controlled airspace
  - Class C controlled airspace
  - Class D controlled airspace
  - Class E controlled airspace
  - Class G uncontrolled airspace
- Special-use airspace, such as prohibited, restricted, warning areas, military operation areas, alert areas, and controlled firing areas
- Other airspace areas, such as Airport Advisory Services, Military Training Routes (MTRs), Temporary Flight Restrictions (TFRs), Parachute Jump Operations, Terminal Radar Services Areas (TRSAs), National Security Areas (NSAs), and Visual Flight Rules (VFR) routes
- Air Traffic Control (ATC) and the NAS

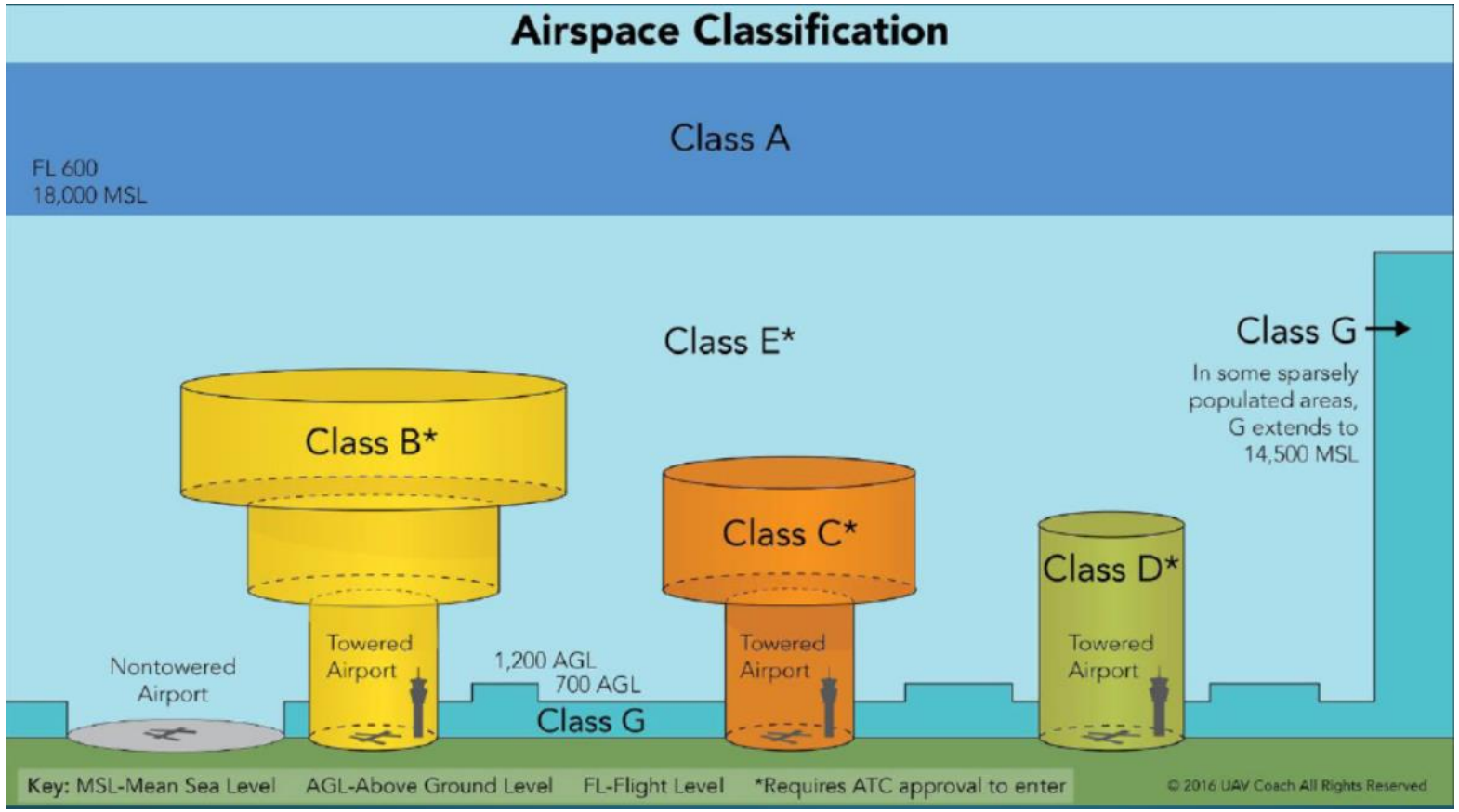
General Airspace

- Categories of Airspace
  - Regulatory – Airspace where the FAA has jurisdiction
  - Non-Regulatory – Airspace where the FAA does not make regulatory enforcement in those areas due to special (military) operations
- Types of Airspace
  - Controlled (Class A, B, C, D, E & Special Use Areas)
  - Uncontrolled (Class G)
  - Special use (prohibited, restricted, warning, military operations, alert, and controlled firing)
  - Other airspace (Airport Advisory Services, MTRs, TFRs, Parachute Jump Operations, TRSAs, NSAs, and VFR routes)
- Airspace Classes on Sectional Charts
  - Class A (Alpha) – You will NEVER fly here
  - Class B (Bravo) – Solid Blue Line
  - Class C (Charlie) – Solid Magenta Line
  - Class D (Delta) – Dashed Blue Line
  - Class E (Echo) – Dashed Magenta Line (surface to 700 AGL); Fuzzy/Solid Magenta Line (with floor 700 feet above surface and ceiling of 1,200 above surface); Fuzzy / Solid Blue Line (with floor 1,200 feet or greater above surface that abuts Class G airspace)
  - Class G (Golf) – Not shown on sectional charts
  - Other airspace – Hashed Blue or Magenta Line

Airspace Classification



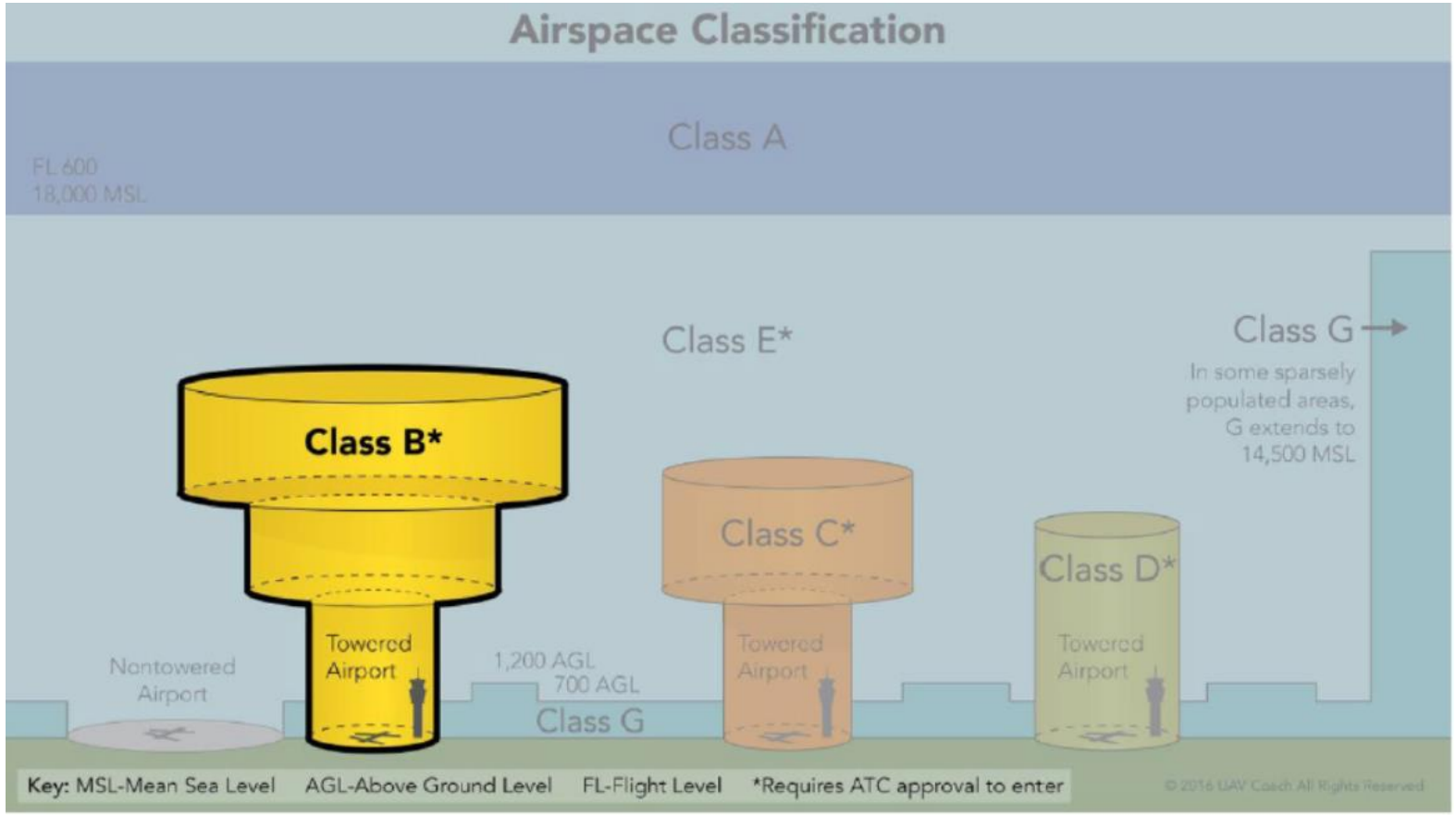
Class A



18,000 feet to 60,000 feet MSL

ATC Clearance is not required – because you will not be flying here!

Class B (Busy Big Blue City)

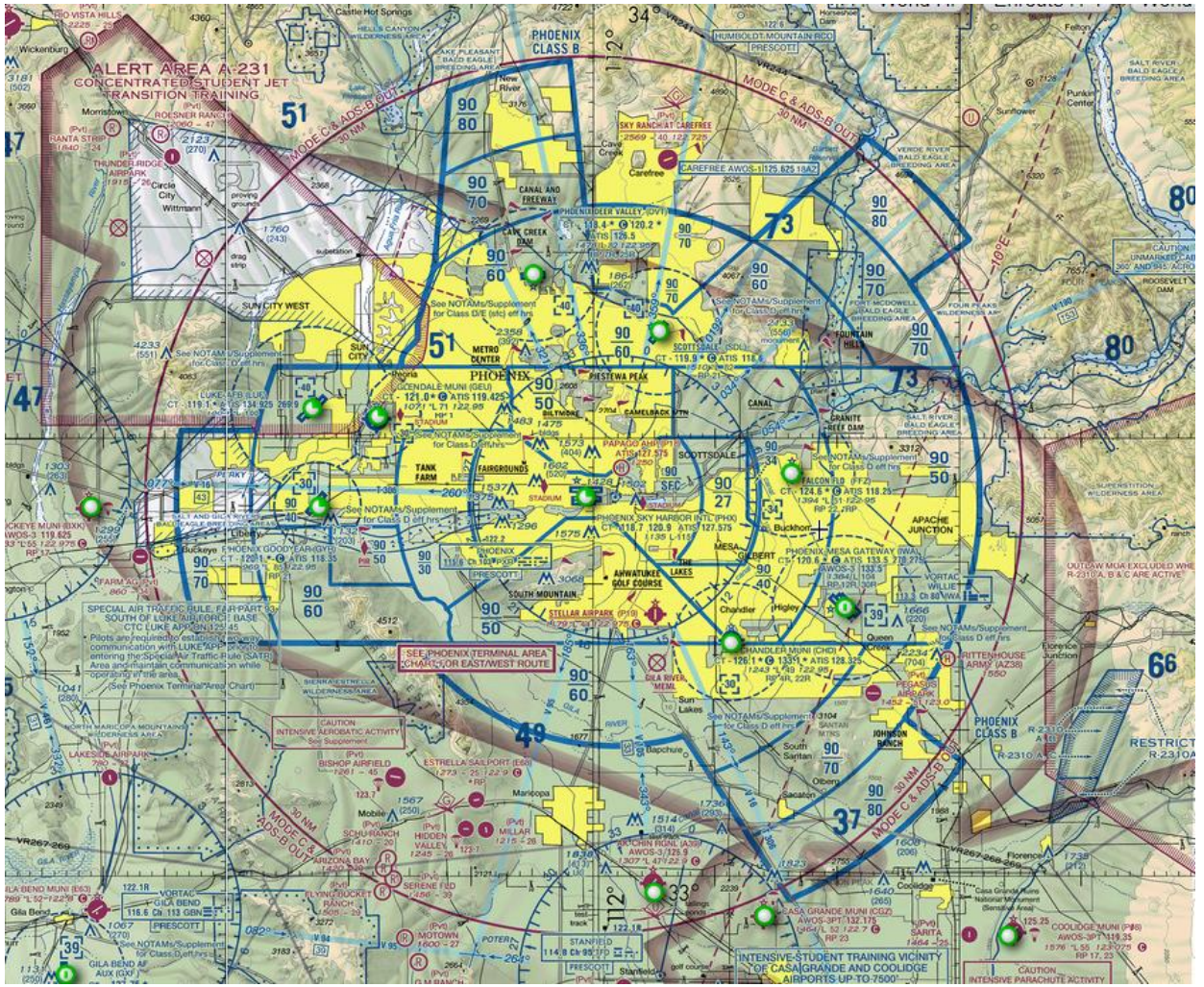


Surface to 10,000 feet MSL

ATC Clearance is required!

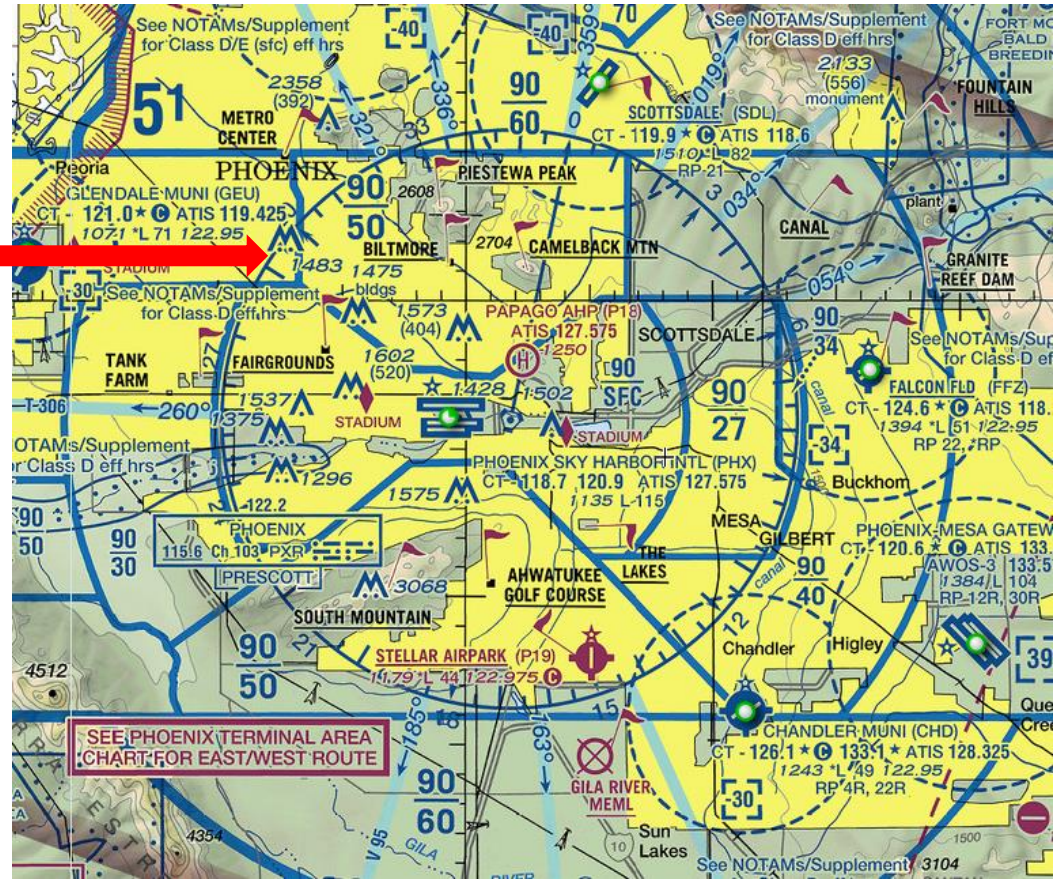
Class B on Sectional Charts – Solid Blue Line

- Class B airspace is controlled airspace that surrounds the country's busiest airports including major air travel hubs in big cities as these airports have some of the highest air traffic volumes in the entire national airspace; you can expect Class B airspace to also have the largest extent
- Airspace Altitude Layers – you may also notice from the graphic, several solid blue lines are surrounding the Phoenix Sky Harbor International Airport (KPHX), each with a unique shape; each of the bounded regions is also labelled with a number, and this number defines the altitude based and ceiling of the path of Class B airspace
- The symbols on the right graphic indicates that the base of the this particular area of Class B airspace starts at the surface and extends up to 9,000 feet

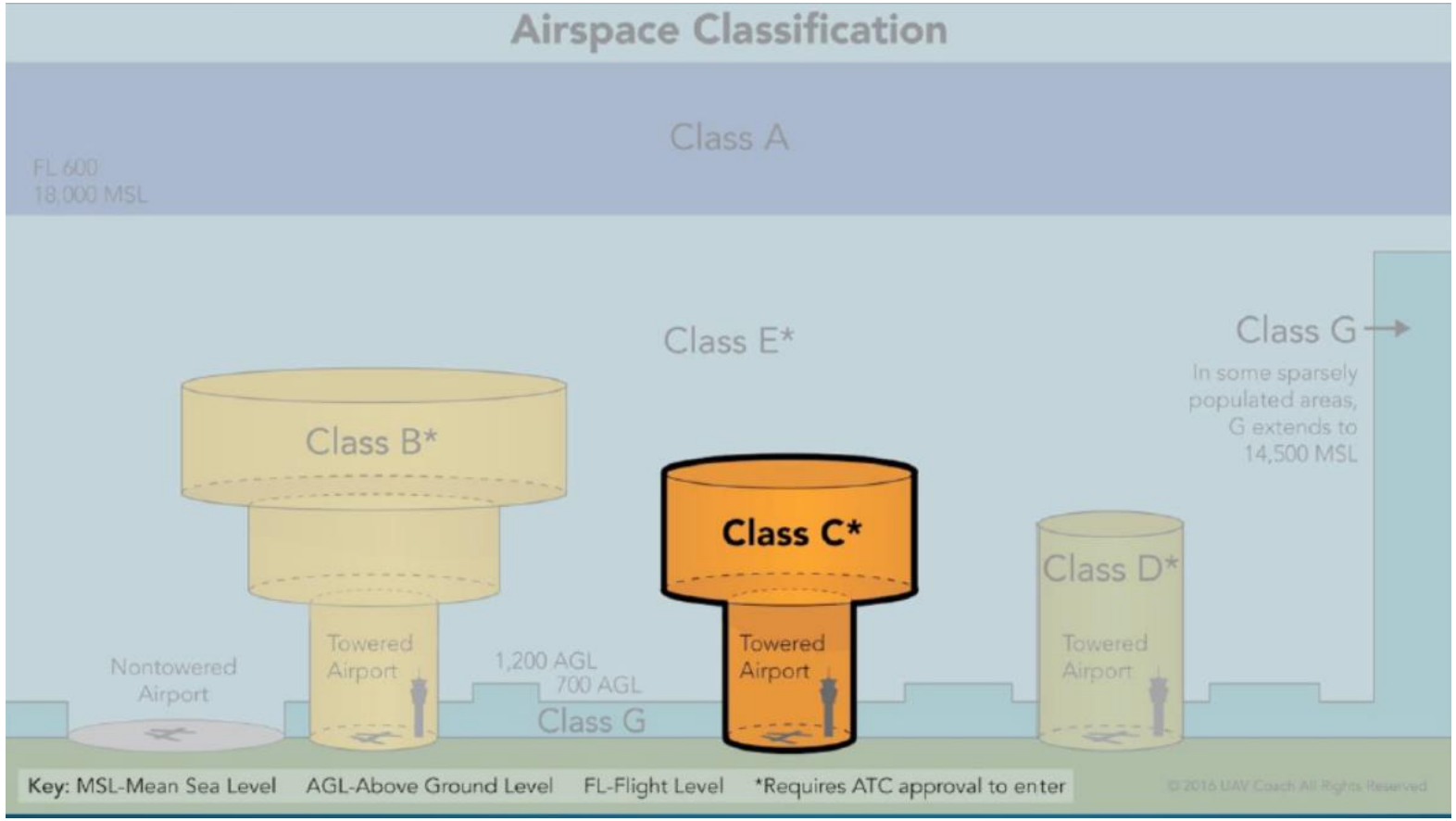


Airports with VOR

- Very High Frequency – Omni-Directional Range (VOR)
- VOR is a short-range radio navigation system used by aircraft to determine their position and navigate along airways
    - VOR is a short-range radio navigation system used by aircraft to determine their position and navigate along airways
    - VOR stations transmit radio signals that aircraft can use to determine their radial from station, providing directional information
    - This is NOT an indicator of airspace
    - Notched Blue Circle like a compass rose



Class C (City)

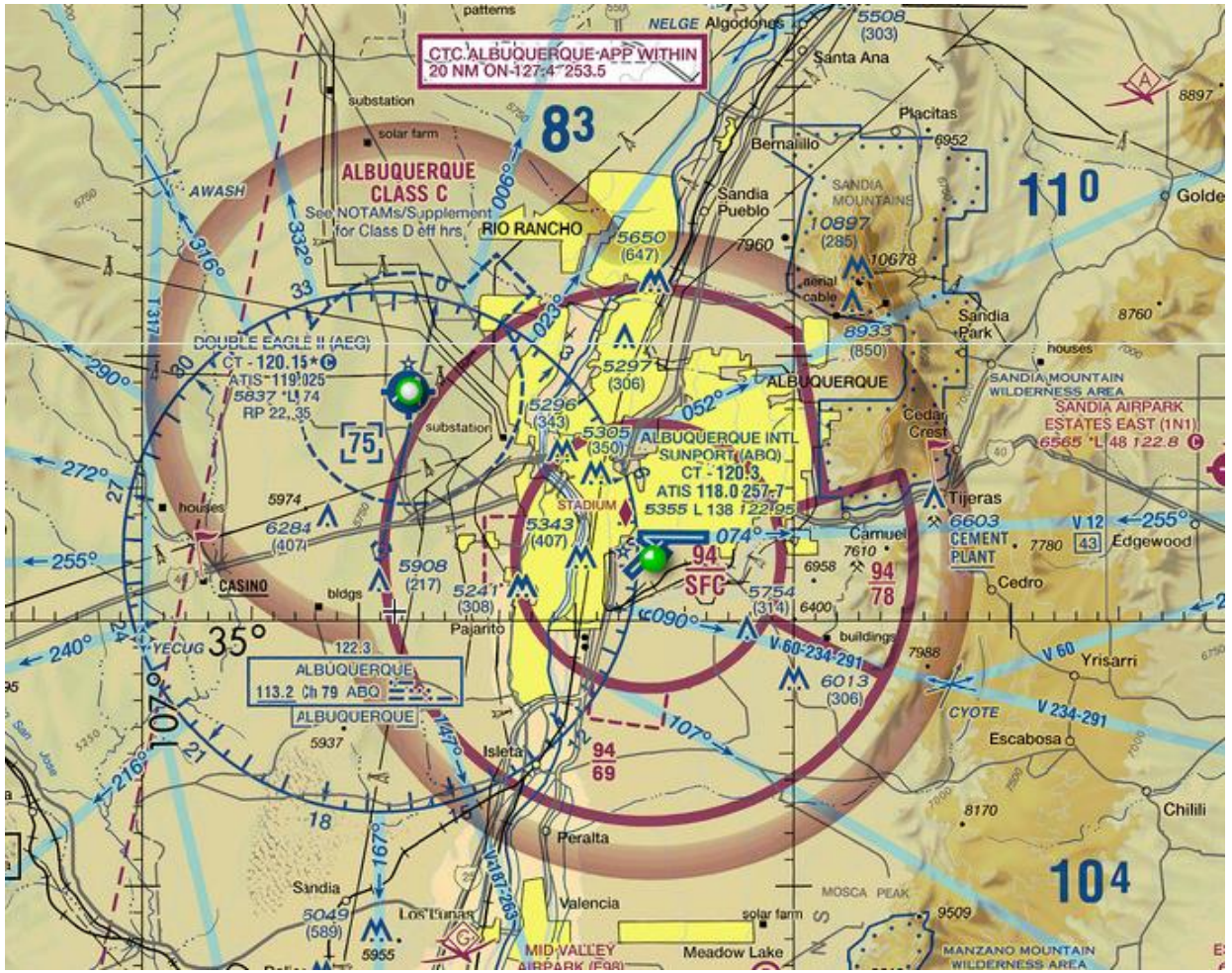


Surface to 4,000 feet AGL (shown in MSL in Sectional Charts, can vary by airport)

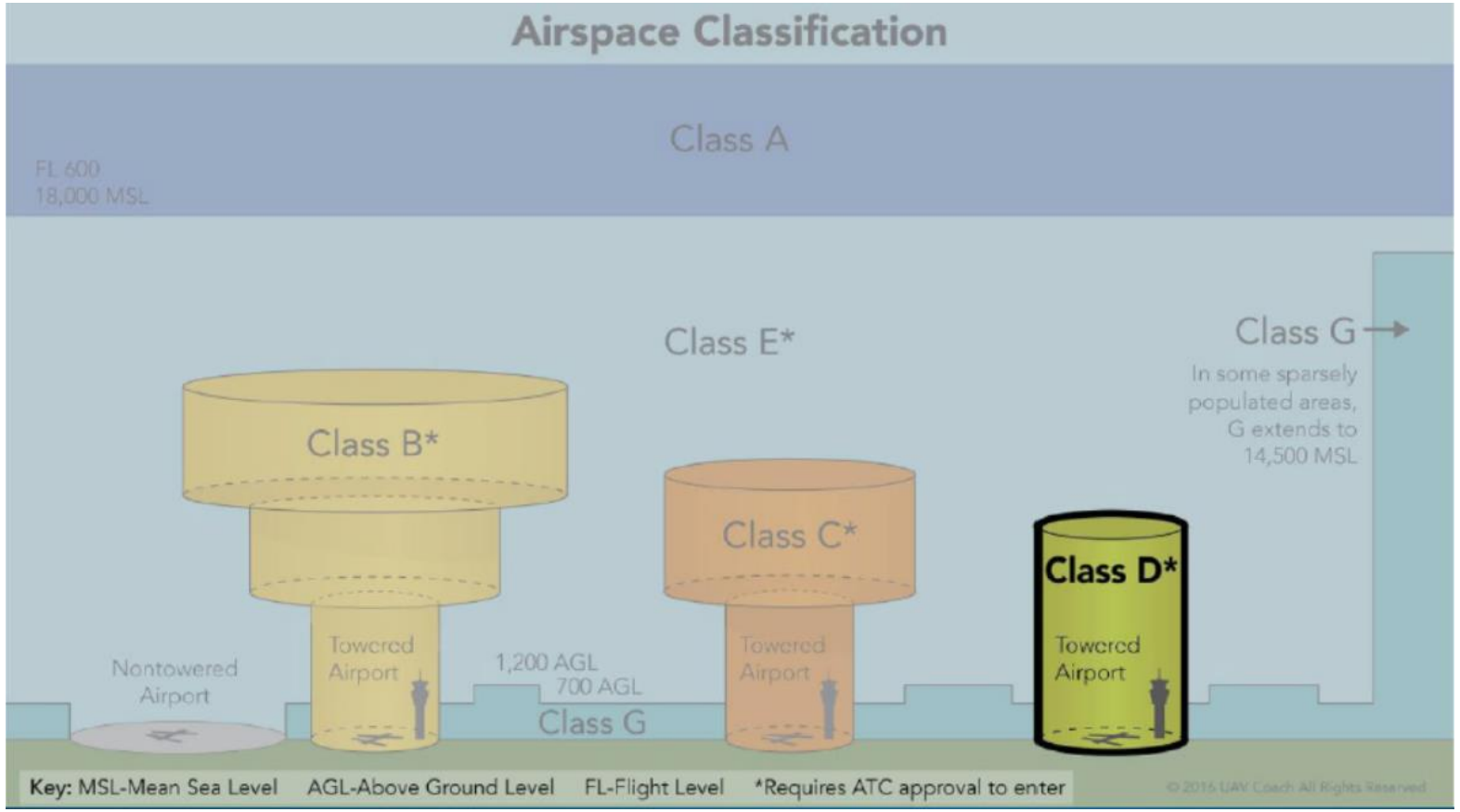
ATC Clearance is required!

Class C on Sectional Charts – Solid Magenta Line

- The extent of Class C airspace is likely smaller than Class B airspace
- You may notice that the base and ceiling of the innermost area is again defined by the same type of symbol, indicating that Class C airspace starts at the surface and extends to 9,400 feet; the base varies on the east side (7,800 feet) and the south side (6,900 feet)
- These slightly variations may have to do with the direction of air traffic in this airport or the presence of other air traffic facilities in the nearby areas



Class D

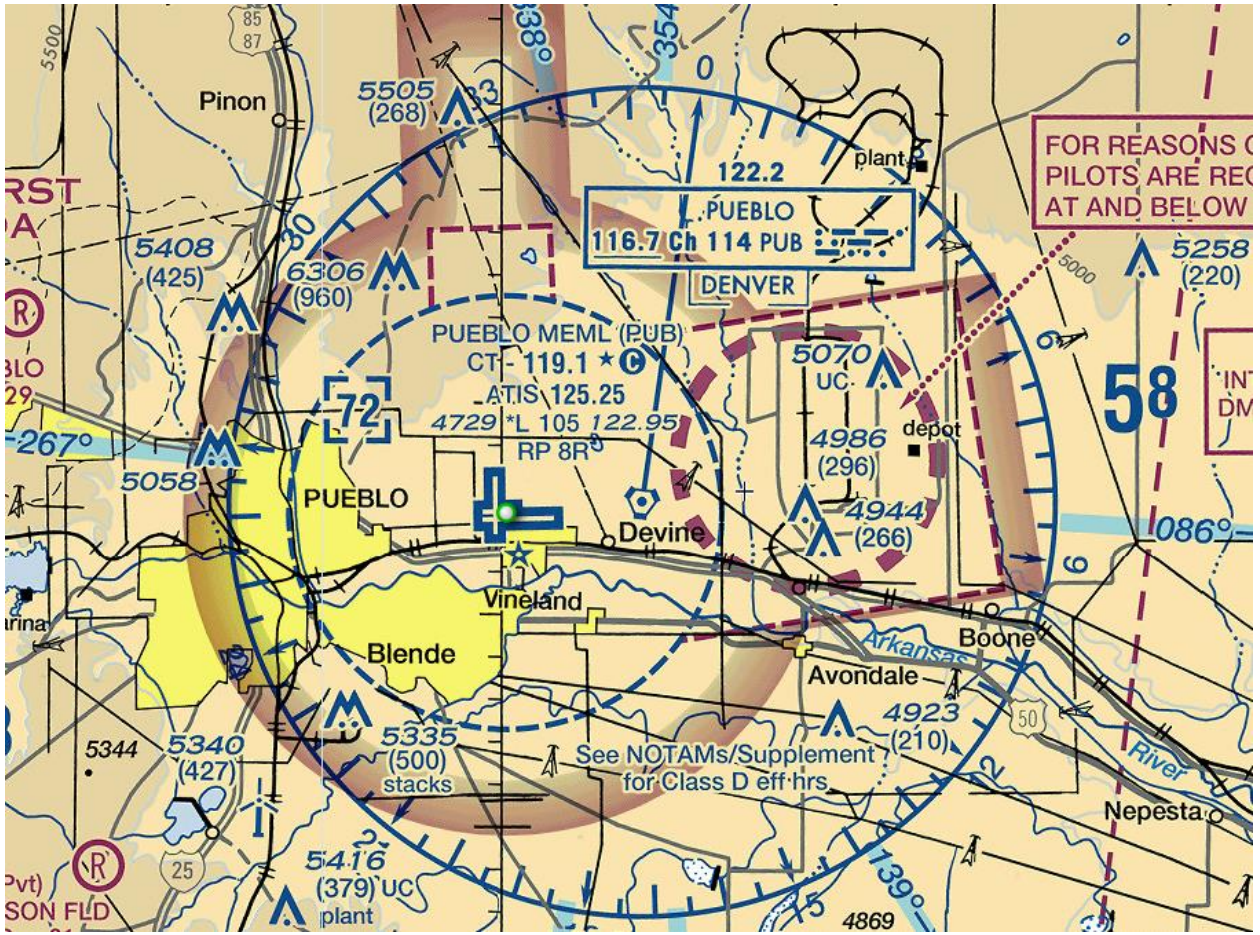


Surface to 2,500 feet AGL (shown in MSL in Sectional Charts, can vary by airport)

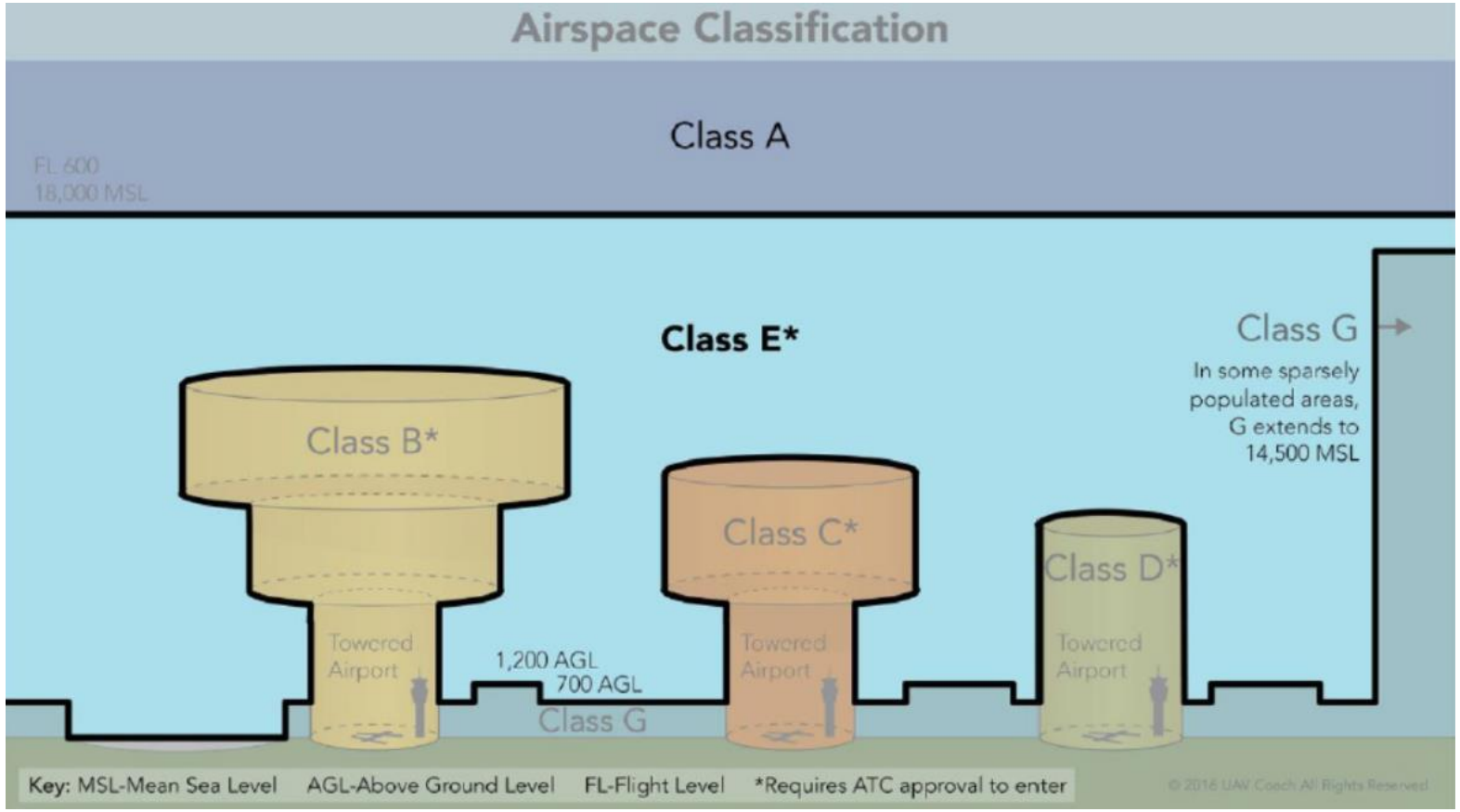
ATC Clearance is required!

Class D on Sectional Charts – Dashed Blue Line

- Not the notched line that is the compass rose or VOR
- Assigned to the smallest airports in the U.S., which means that they also have the smallest extend out of all controlled airspace classes
- Aside from being relatively small, Class D airspace always starts at the surface, making them easier to represent in sectional charts
- Instead of a figure indicating the base and ceiling of the controlled airspace, only a single number – 72 – enclosed by a square bracket
- This represents the ceiling of Class D airspace in this airport, which is 7,200 feet



Class E (Everywhere else, mostly)



Surface to 700 feet AGL or 1,200 feet AGL up to but not including 18,000 feet MSL

ATC Clearance is required!

Class E on Sectional Charts – Various Lines

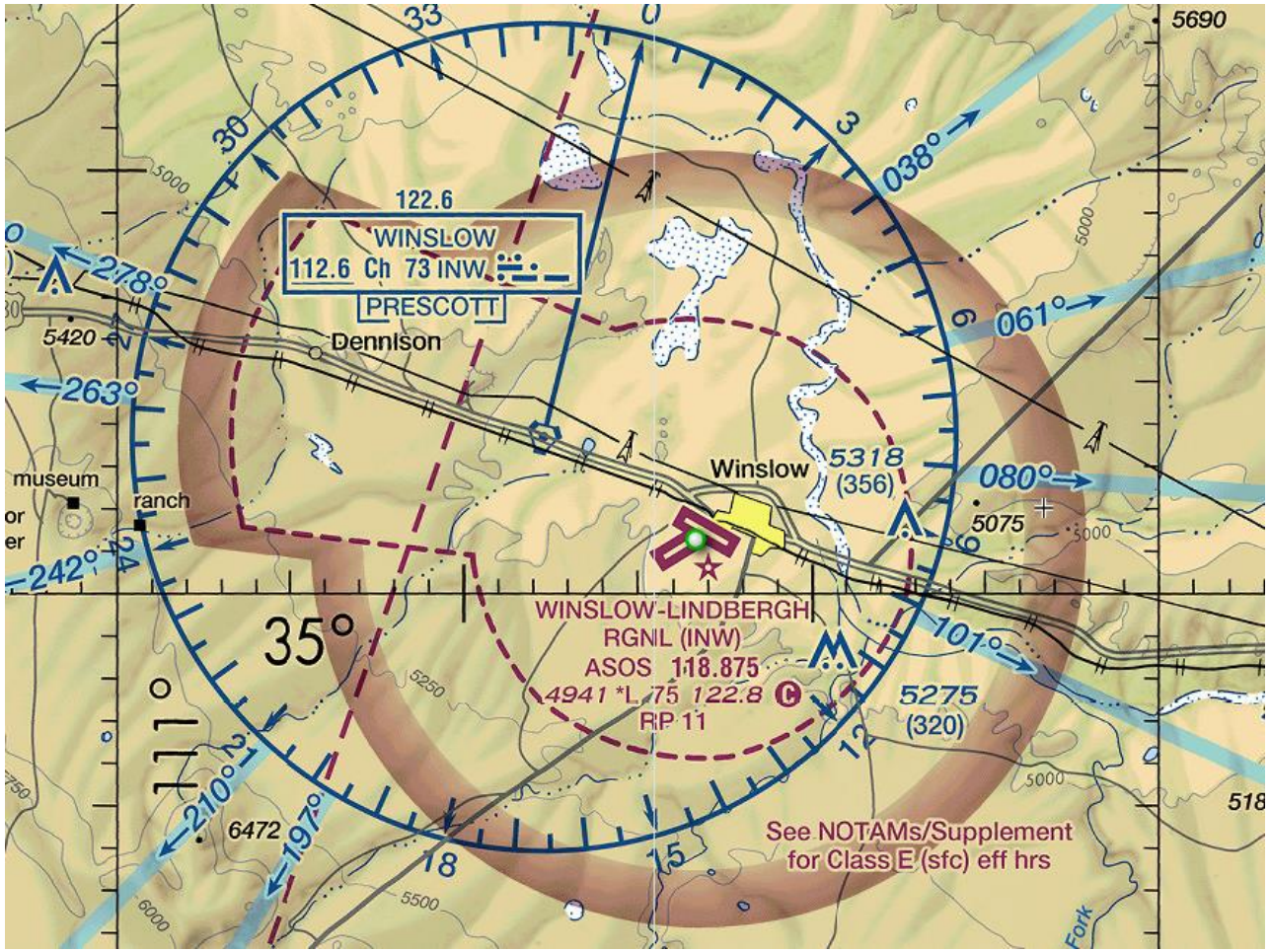
Class E airspace		Class E airspace starting at the surface and extending up to 700 feet
		Class E airspace from 700 feet to 1200 feet
		Class E airspace starting at 1200 feet
		This symbol indicates the floors of Class E airspace greater than 700 feet above ground level

Surface to 700 feet AGL or 1,200 feet AGL up to but not including 18,000 feet MSL

ATC Clearance is required!

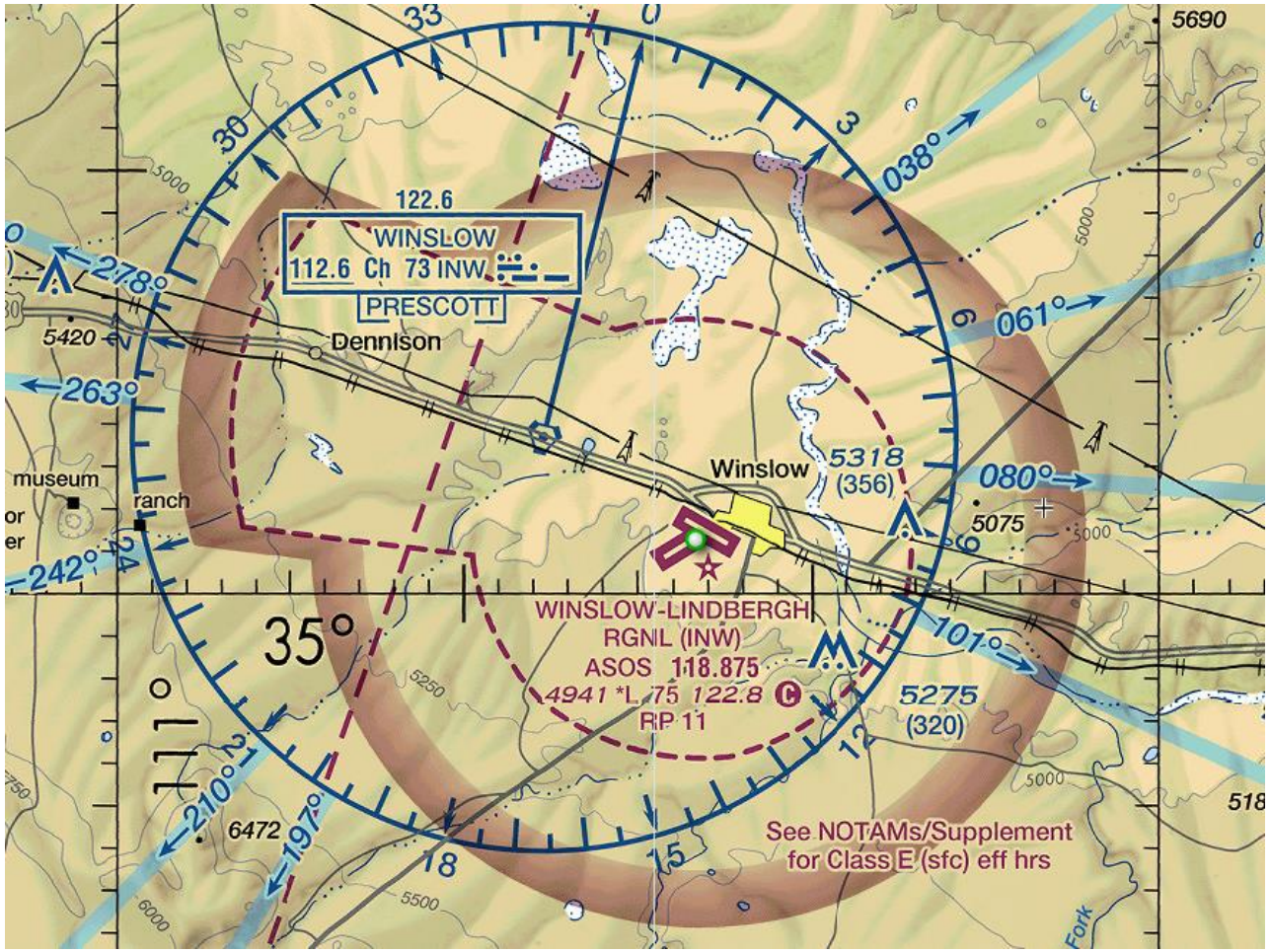
Class E on Sectional Charts

- Class E refers to all other areas of controlled airspace that have not been covered by the previous categories
- Because it fills in the empty spaces between the airspace classes B to D, most of the national airspace is actually categorized under Class E
- The good news is that most sUAS flight is authorized within Class E airspace without having to secure airspace authorization with just a few exceptions
- The general rule to follow is that you will still need airspace authorization if it occurs within the proximity of an airport
- Otherwise, you can go ahead and fly your drone without making such as request

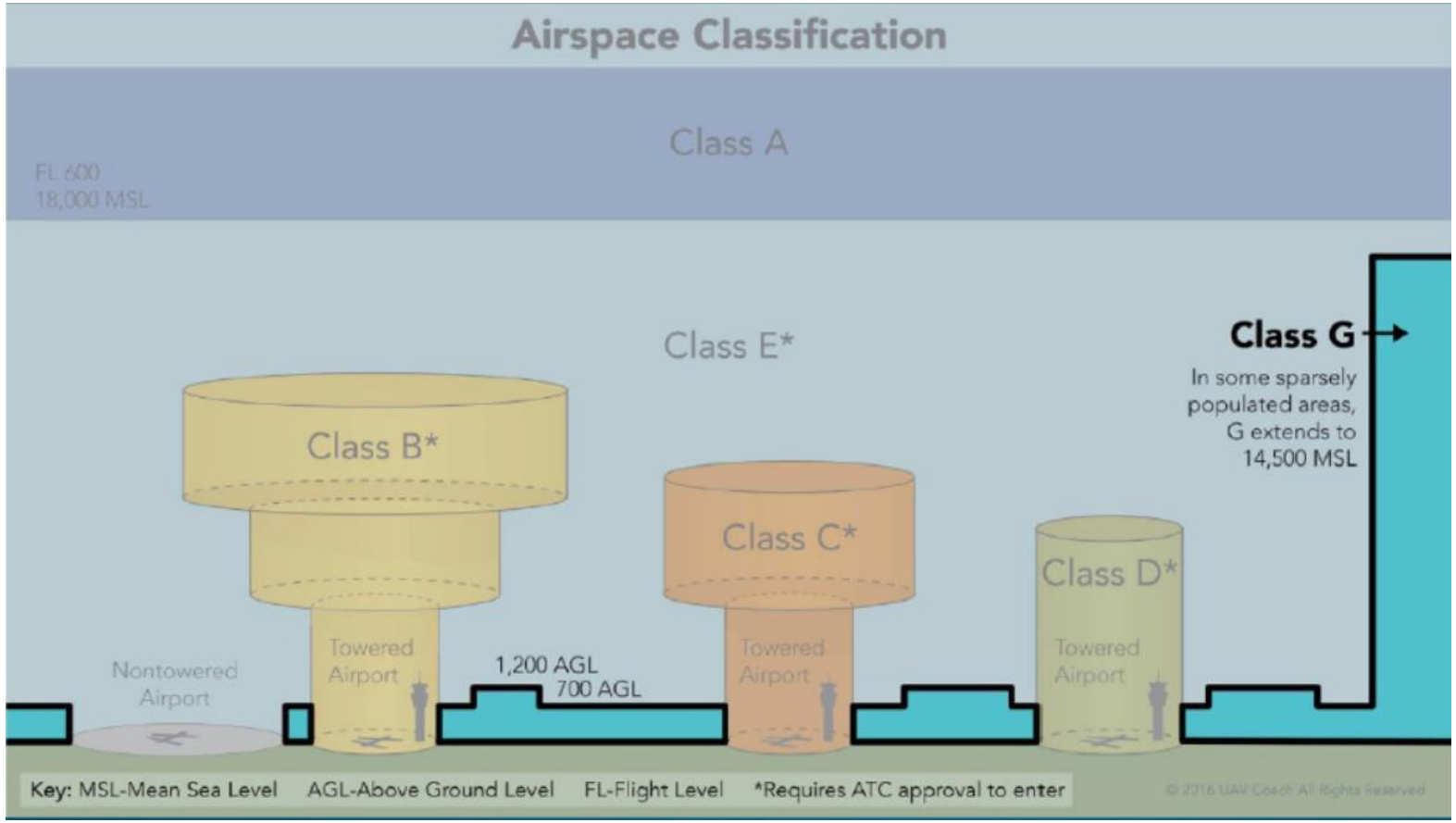


Notes on Class E

- Class E almost always has one of the four lower limits – the surface, 700 feet AGL, 1,200 feet AGL, or in some sparsely populated areas, 14,500 feet MSL
- Most of the U.S. has a Class E airspace lower limit of 700 or 1,200 feet AGL
- To operate in Class E airspace at surface you will need the required ATC permission if your operation is within the proximity of an airport
- If you entering Class E airspace vertically you are not required to get the permission ahead of time (for emergency)



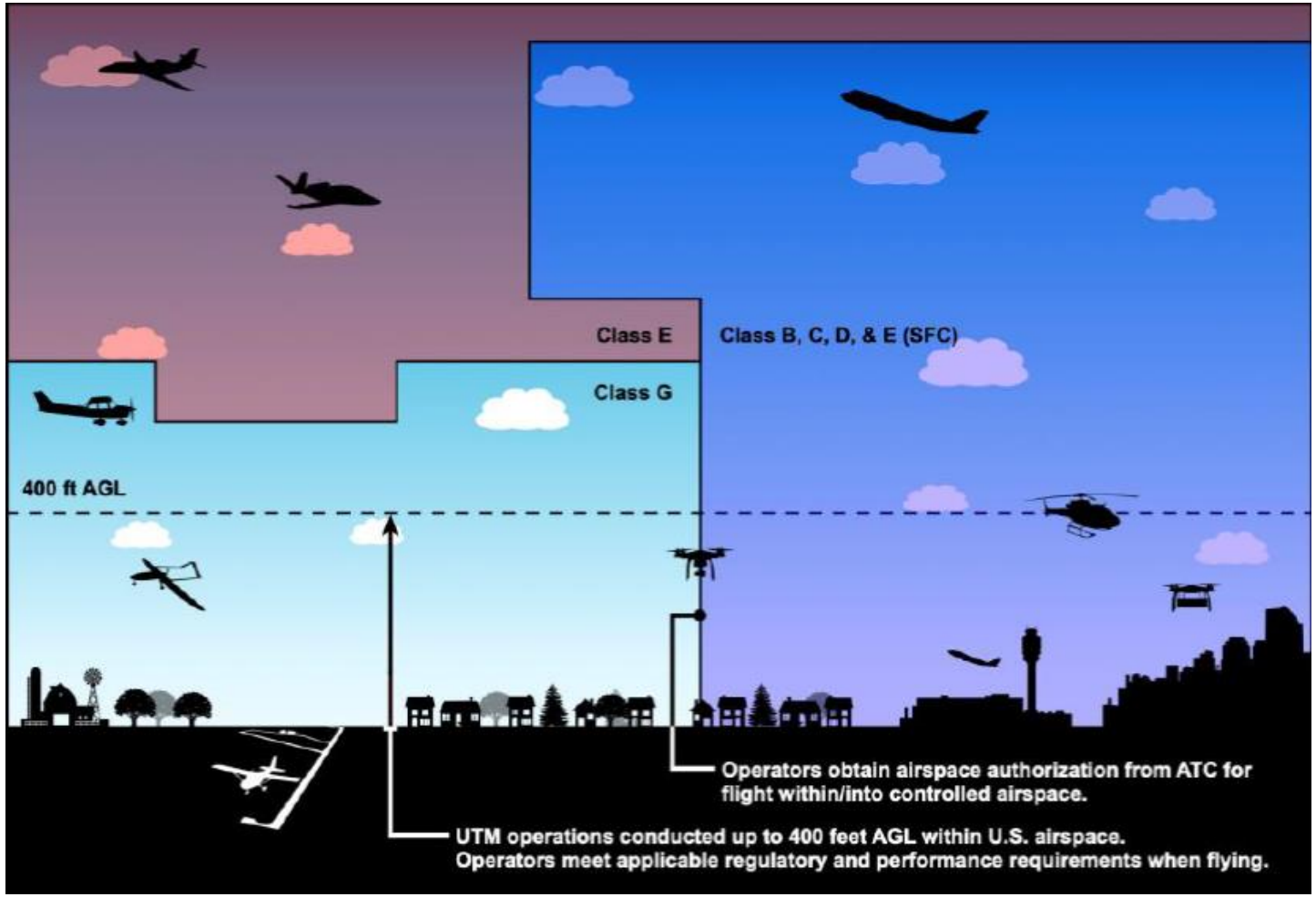
Class G (Ground)



Surface to 700 feet AGL or 1,200 feet AGL, Uncontrolled

ATC Clearance is NOT required!

Class G – Another View



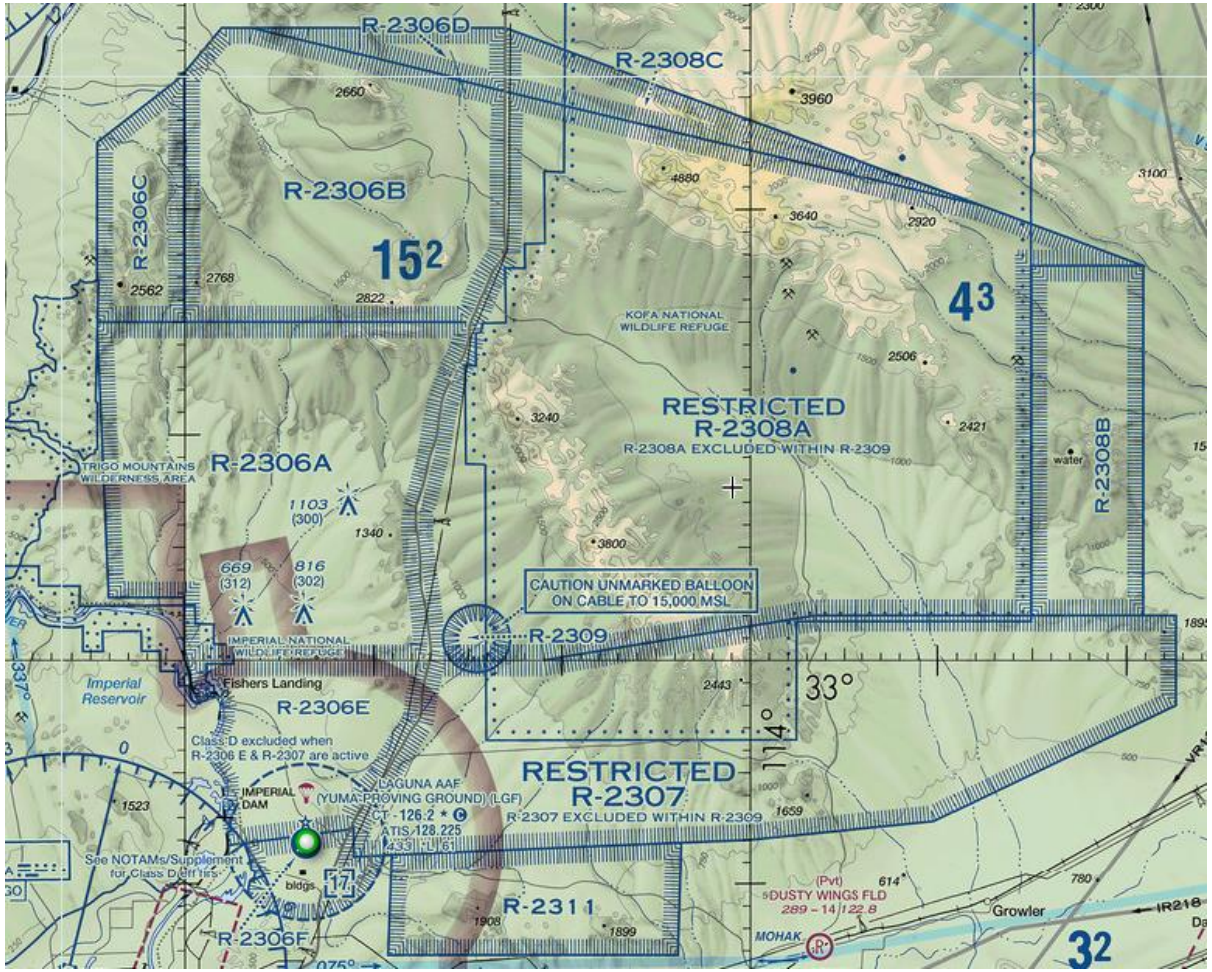
This is where you will fly most of the time!

Other (Non-Regulatory) Airspace

- Blue has
- Restricted Airspace – Blue Hash marks
- Prohibited Areas – Blue Hash marks
- Warning Areas – Blue Hash marks
- Military Operations Area (MOA) – Magenta Hash marks
- Alert Areas – Magenta Hash marks

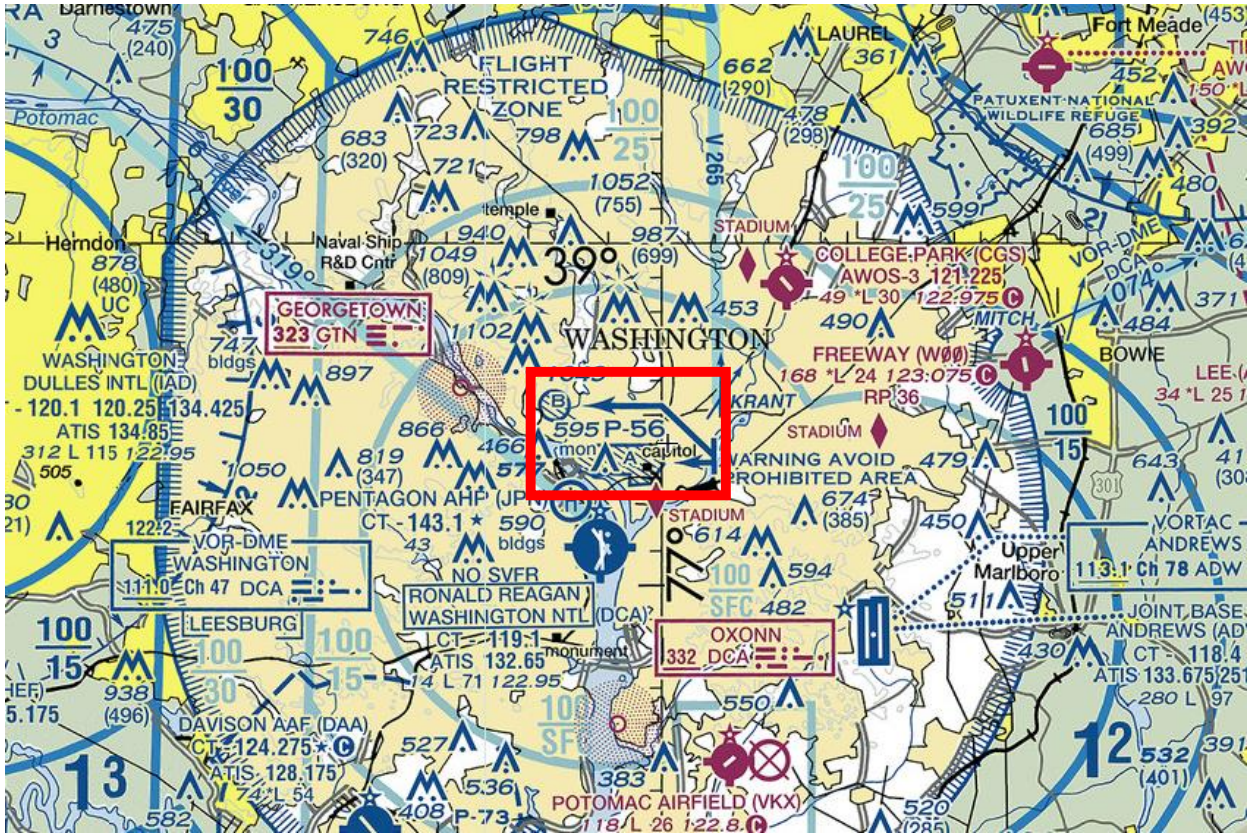
Restricted Airspace

- Blue Hash marks
- Military controlled
- Can seek permission but is subject to restrictions and it will likely take a long time, and therefore plan ahead
- Charted with an “R” followed by a number (e.g., R-2307) and area depicted on the enroute chart appropriate for use at the altitude or flight level (FL) being
- More information on the back of the sectional chart



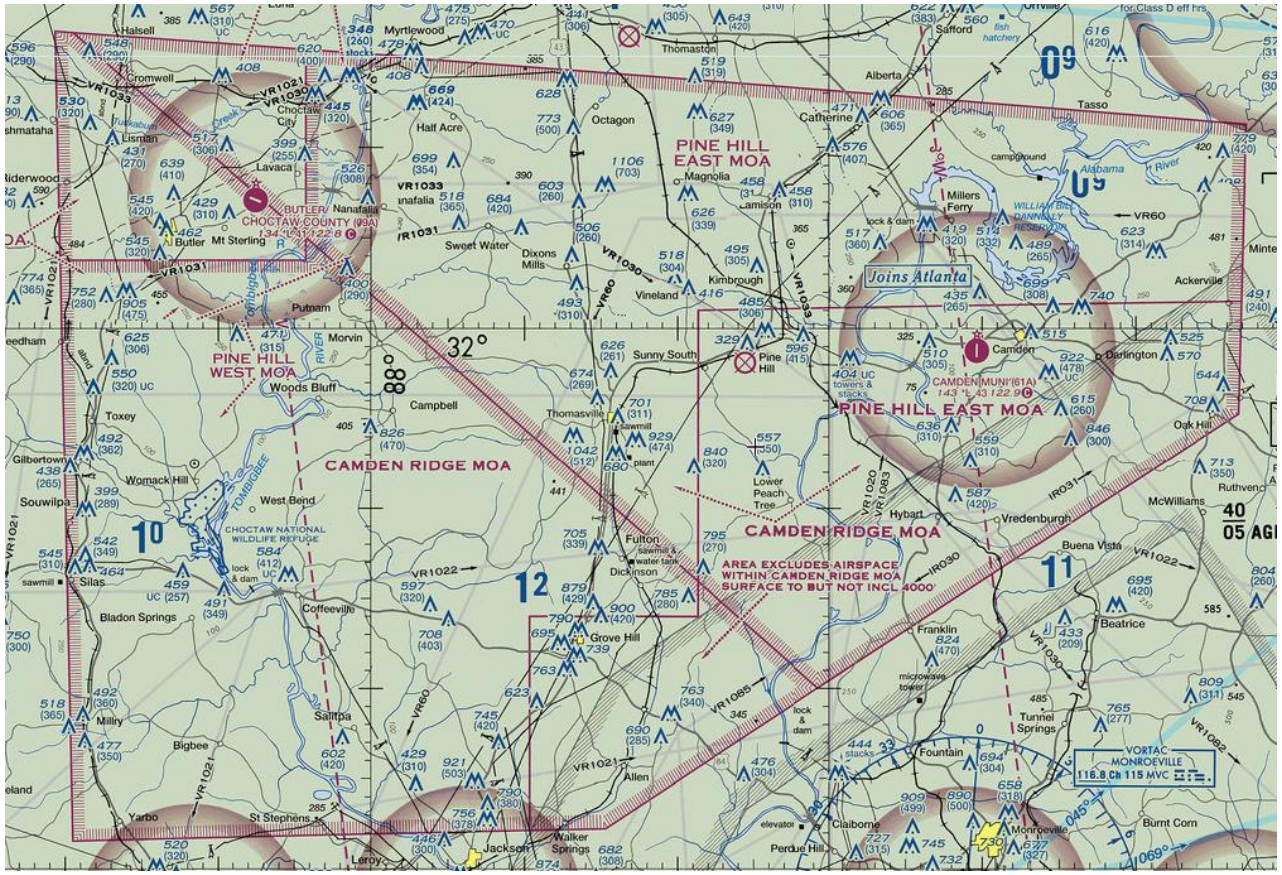
Prohibited Areas

- Blue Hash marks
- Cannot fly here, period
- The area is charted as a “P” followed by a number (e.g., P-56)



Military Operations Areas (MOAs)

- Magenta Hash marks
- Can fly in you are in Class G but must not impinge on any other controlled airspace, but it require caution
- Before flying contact Flight Service Station to determine if the area is “hot”, and if it is “hot”, there is no chance or not going to happen to get permission to fly; if it is “cold”, likely can get permission to fly
- MOAs are depicted on sectional charts, visual flight rules (VFR) terminal area charts, and enroute low-altitude charts, and are not numbered (e.g., Camden Ridge MOA)
- Each pilot is responsible for collision avoidance



Controlled Firing Areas (CFAs)

- Areas where potentially hazardous activities might endanger non-participating aircraft if not done in a controlled environment
- Activities must be suspended if spotter aircraft, radar, an/or ground lookouts indicate an aircraft might be approaching the area
- They do not appear on sectional charts as they do not require approaching aircraft to modify their flightpath
- CFAs are a tool used by the Marine Corps to meet training requirements without affecting general aviation

Military Training Routes (MTRs)

- MTRs are identified as Instrument Flight Rules (IFR, denoted as IR on sectional charts) and Visual Flight Rules (VFR, denoted VR on sectional charts), followed by a number (e.g., VR97-1059; IR18)
- All of this information is displayed on a straight line, with an arrow
- Routes with four numbers denote routes flown at 1,500 feet AGL and below.
- Routes with two or three numbers denote routes flown with at least one segment above 1,500 feet AGL

More Airspace Areas

- Local Airport Advisory (LAA) – provided by Flight Service Station (FSS) facilities for selected airport; not relevant to UAS flights
- Parachute Jump Operations – indicated on Sectional Chart with this icon 
- Terminal Radar Service Areas (TRSAs) – depicted on VFR charts and terminal area charts with a solid black line and altitudes for each segment; the Class D portion is charted with a blue segmented line; participation is voluntary but encouraged
- National Security Areas (NSAs) – they 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; flight in NSAs may be temporarily prohibited; a NOTAM will be issued with all necessary details

More Airspace Areas

- Visual Flight Rules (VFR) – published visual flight rules (VFR) routes are for transitioning around, under, or through some complex airspace; these routes are generally found on VFR Wall Planning charts; on these charts you might see terms such as VFR flyway, VFR corridor, Class B airspace VFR transition route, and terminal area VFR route
- Highlights
  - The primary purpose of the Air Traffic Control (ATC) system is to prevent a collision between aircraft operating in the system and to organize and expedite the flow of traffic
  - The safety of flight is a top priority of all pilots and the responsibility associated with operating an aircraft should always be taken seriously; the air traffic system maintains a high degree of safety and efficiency with strict regulatory oversight of the FAA
  - It is important that pilots be familiar with the operational requirements for each of the various types or classes of airspace
  - See and Avoid