### II.K. National Airspace System

References: 14 CFR part 71, 91; Navigational Charts; AIM

**Objectives**

To develop knowledge of the elements related to the National Airspace System.

**Key Elements**

1. Entry Requirements
2. Communications Requirements
3. Visibility Requirements

**Elements**

1. Airspace classes and their operating rules, pilot certification, and equipment requirements
2. VFR weather minimums
3. Special Use Airspace
4. Other Airspace areas

**Schedule**

1. Discuss Objectives
2. Review material
3. Development
4. Conclusion

**Equipment**

1. White board and markers
2. References

**IP’s Actions**

1. Discuss lesson objectives
2. Present Lecture
3. Ask and Answer Questions
4. Assign homework

**SP’s Actions**

1. Participate in discussion
2. Take notes
3. Ask and respond to questions

**Completion Standards**

The student displays the ability to differentiate between the different airspaces and their respective weather minimums and requirements.
Instructors Notes:

Introduction:
Attention
Airspace is like different countries. Each type of airspace has its own controller or ruler, its own rules for those in their ‘territory,’ and its own benefits or services which are provided to its current ‘citizens.’ Borders are drawn and permission is necessary to enter certain airspaces (e.g. Passport).

Overview
Review Objectives and Elements/Key ideas

What:
Airspace is defined as, “the portion of the atmosphere above a particular land area, especially above a nation. The atmosphere above the United States is divided into several sectors, or classes and in each airspace class, specific rules apply.

Why:
Different airspaces have been defined to efficiently manage the large amount of air traffic that traverses the sky each day. In order to fly from place to place a pilot must know the rules and requirements regarding airspace.

How:
1. **Airspace Classes** (Pilot’s Encyclopedia; AIM 3-2-1)
   A. Class E Airspace
      i. Definition
         a. Generally controlled airspace that is not designated A, B, C, or D
         b. Where the majority of your flying time will be
      ii. Operating Rules and Pilot/Equipment Requirements
         a. Previously established rules apply:
            • Transponder above 10,000
               a. Transponder Requirements (91.215(d))
                  1. At or above 10,000’ MSL
                     a. Excluding airspace below 2,500’ AGL
                  2. Within 30 miles of a class B airspace primary airport, below 10,000’ MSL
                  3. Within and above all Class C airspace, up to 10,000’ MSL
                  4. Within 10 miles of certain designated airports
                     a. Excluding airspace which is both outside the Class D surface area and below 1,200’ AGL
                  5. Flying into, within, or across the ADIZ
            • Airspeeds (91.117)
               a. No more than 250 knots below 10,000’ MSL
               b. Below 2,500’ AGL within 4 nm of the primary class C, D airspace not over 200 knots
               c. Underlying Class B airspace designated for an airport or in a VFR corridor designated through class B airspace not over 200 knots
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b. Pilot Qualifications: Student Pilot

iii. ATC Services
   a. There are no communication requirements flying VFR but you can request traffic advisory services from ATC
      • Provided on workload-permitting basis

iv. Vertical Limits
   a. Unless designated at a lower altitude, Class E Airspace begins at 14,500’ MSL to, but not including, 18,000’ MSL overlying:
      • The 48 contiguous states including the waters within 12 miles from the coast
      • The District of Columbia
      • Alaska
   b. Extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace

v. Segments of Class E Airspace
   a. Class E and the Low Altitude Airway System
      • Connects one navaid to another
         a. VOR to VOR (Victor Airways)
         • Unless otherwise specified, they extend upward from 1,200’ to, but not including, 18,000’ MSL
            a. Mountainous terrain may have a floor above 1,200’
            • Airways are usually 8 nm wide
   b. Class E and Airports
      • Extension to a Surface Area
         a. There are Class E airspace areas that serve as extensions to Class B, Class C, and Class D surface areas designated for an airport. Such airspace provides controlled airspace to contain standard instrument approach procedures without imposing a communications requirement on pilots operating VFR
            1. EX: Athens – Class E Surface Area
            2. EX: Washington Wilkes – Class E extension
      • Airspace Used for Transition
         a. Allow IFR traffic to remain in controlled airspace while transitioning between the enroute and airport environments
         b. There are Class E airspace areas beginning at either 700’ or 1,200’ AGL used to transition to/from the terminal or en route environment
            c. EX: Baldwin??
   c. When needed for IFR control purposes
      • En Route Domestic Areas
         a. Provide controlled airspace in those areas where there is a requirement to provide IFR en route ATC services but the Federal Airway System is inadequate
         b. Airspace areas that extend upward from a specified altitude as an en route domestic airspace
      • Offshore Airspace Areas
         a. Provide IFR en route ATC services and within which the US is applying domestic procedures
         b. Airspace areas extending upward from a specified altitude to, but not including, 18,000’ MSL to provide controlled airspace beyond 12 miles from the coast of the US
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B. Class D Airspace
   i. Definition
      a. Generally extends from the surface to 2,500 feet above the airport elevation
      b. Normally 4 nm radius
         • Changes depending on needs
      c. These airports have a part time operational control tower
         • Class D only when the tower is in operation
         • Otherwise Class E
      d. The configuration of Class D airspace is configured to meet the operational needs/instrument procedures of the area
   ii. Operating Rules and Pilot/Equipment Requirements
      a. Pilot Certification
         • No specific certification required
      b. Equipment
         • Two-way radio
            a. Must establish two-way radio communication with the tower prior to entering the airspace

C. Class C Airspace
   i. Definition
      a. Generally extends from the surface to 4,000 feet above the airport elevation
      b. These airports have an operational control tower and are serviced by a radar approach control, and with a certain number of IFR operations or passenger enplanements
      c. The airspace usually consists of a 5 NM radius core surface area that extends from the surface to 4,000 feet above airport elevation, and a 10 NM radius shelf area that extends from 1,200 feet to 4,000 feet above the airport elevation
   ii. Operating Rules and Pilot/Equipment Requirements
      a. Pilot Certification
         • No specific certification required
      b. Equipment
         • Two-way radio
            a. Must establish two-way radio communication with ATC prior to entering the airspace
            • Operable radar beacon transponder with automatic altitude reporting equipment

D. Class B Airspace
   i. Definition
      a. Generally the airspace from the surface to 10,000 feet MSL surrounding the nation’s busiest airports (IFR traffic)
      b. The configuration of Class B airspace is individually tailored to the needs of a particular area and consists of a surface area and two or more layers
         • Represents an upside down wedding cake
         • Designed to contain all instrument procedures once entered
   ii. Operating Rules and Pilot/Equipment Requirements
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a. For VFR Operations:
   • At least a Private Pilot Certificate is required
     a. Exception: student/recreational pilots seeking private pilot certification with an endorsement (CFR 61.95)
   • ATC Clearance is required before entering
   • Must be equipped with an operable two-way radio
   • 4096-code Mode C transponder
   • Mode C Veil
     a. Airspace within 30 nm of a primary Class B airport, from the surface to 10,000’ MSL
     b. Aircraft operating in this airspace must be equipped with automatic pressure altitude reporting equipment having Mode C capability

b. For IFR operations:
   • An operable VOR or TACAN receiver
   • An operable radar beacon transponder with automatic altitude reporting equipment

E. Class A Airspace
   i. Generally the airspace from 18,000 feet MSL up to and including FL600, including the airspace overlying the waters within 12 NM of the coast of the 48 contiguous states and Alaska
   ii. Operating Rules and Pilot/Equipment Requirements
       a. Unless otherwise authorized, all operation in Class A airspace will be conducted under IFR

F. Class G Airspace
   i. Definition
      a. Uncontrolled Airspace
      b. The portion of airspace that has not been designated as Class A, B, C, D, or E
   ii. Extends from the surface to the base of the overlying Class E airspace
   iii. Although ATC has no authority/responsibility to control air traffic here, there are VFR minimums which apply to Class G airspace
<table>
<thead>
<tr>
<th>Class Airspace</th>
<th>Entry Requirements</th>
<th>Equipment</th>
<th>Minimum Pilot Certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>ATC Clearance</td>
<td>IFR Equipped</td>
<td>Instrument Rating</td>
</tr>
<tr>
<td>B</td>
<td>ATC Clearance</td>
<td>Two-way radio, transponder with Altitude Reporting Capability</td>
<td>Private – with exception</td>
</tr>
<tr>
<td>C</td>
<td>Two-way radio communications prior to entry</td>
<td>Two-way radio, Transponder with Altitude reporting capability</td>
<td>No specific requirement</td>
</tr>
<tr>
<td>D</td>
<td>Two-way radio communications prior to entry</td>
<td>Two-way radio</td>
<td>No specific requirement</td>
</tr>
<tr>
<td>E</td>
<td>None for VFR</td>
<td>No specific requirement</td>
<td>No specific requirement</td>
</tr>
<tr>
<td>G</td>
<td>None</td>
<td>No specific requirement</td>
<td>No specific requirement</td>
</tr>
</tbody>
</table>
### Basic VFR Weather Minimums

<table>
<thead>
<tr>
<th>Airspace</th>
<th>Flight Visibility</th>
<th>Distance From Clouds</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLASS A</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>CLASS B</td>
<td>3 Statute Miles</td>
<td>Clear of Clouds</td>
</tr>
<tr>
<td>CLASS C</td>
<td>3 Statute Miles</td>
<td>500 feet below</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,000 feet above</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2,000 feet horizontal</td>
</tr>
<tr>
<td>CLASS D</td>
<td>3 Statute Miles</td>
<td>500 feet below</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,000 feet above</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2,000 feet horizontal</td>
</tr>
<tr>
<td>CLASS E</td>
<td>3 Statute Miles</td>
<td>500 feet below</td>
</tr>
<tr>
<td>Less than 10,000 feet MSL</td>
<td></td>
<td>1,000 feet above</td>
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<tr>
<td></td>
<td></td>
<td>2,000 feet horizontal</td>
</tr>
<tr>
<td>At or above 10,000 feet MSL</td>
<td>5 Statute Miles</td>
<td>1,000 feet below</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,000 feet above</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 mile horizontal</td>
</tr>
<tr>
<td>CLASS G</td>
<td>1 Statute Mile</td>
<td>Clear of Clouds</td>
</tr>
<tr>
<td>1,200 feet or less above the surface (regardless of MSL altitude)</td>
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<td></td>
</tr>
<tr>
<td>Day, except as provided in section 91.155(b)</td>
<td>1 Statute Mile</td>
<td>500 feet below</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,000 feet above</td>
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<tr>
<td></td>
<td></td>
<td>2,000 feet horizontal</td>
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<tr>
<td>Night, except as provided in section 91.155(b)</td>
<td>3 Statute Miles</td>
<td>500 feet below</td>
</tr>
<tr>
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<tr>
<td></td>
<td></td>
<td>2,000 feet horizontal</td>
</tr>
<tr>
<td>More than 1,200 feet above the surface but less than 10,000 feet MSL</td>
<td>1 Statute Mile</td>
<td>500 feet below</td>
</tr>
<tr>
<td>Day</td>
<td></td>
<td>1,000 feet above</td>
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<td>2,000 feet horizontal</td>
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<td>More than 1,200 feet above the surface and at or above 10,000 feet MSL</td>
<td>5 Statute Miles</td>
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<td>1 mile horizontal</td>
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*Exception – 91.155 (b)(2)*
3. Special Use Airspace

Special Use airspace exists where activities must be confined because of their nature. In special use airspace, limitations may be placed on aircraft that are not a part of the activities.

A. Prohibited Areas
   i. Airspace within which the flight of aircraft is prohibited
   ii. Established for security or other purposes associated with the national welfare
   iii. Published in the Federal Register and are depicted on aeronautical charts

B. Restricted Areas
   i. Airspace within which the flight of aircraft, while not wholly prohibited, is subject to restrictions
   ii. Denote the existence of unusual, often invisible hazards to aircraft
       a. Such as artillery firing, aerial gunnery, or guided missiles
   iii. An aircraft may not enter a restricted area unless permission has been obtained from the controlling agency
       a. If it is not active ATC will allow the aircraft to operate in the airspace
       b. If it is active the ATC will ensure the aircraft avoids the restricted area
   iv. Restricted areas are depicted on aeronautical charts and are published in the Federal Register

C. Warning Areas
   i. Airspace extending from 3 nm outward from the coast of the US, that may be hazardous to nonparticipating aircraft
       a. The activities may be much the same as those for a restricted area
   ii. The purpose is to warn nonparticipating pilots of the potential danger
   iii. They are depicted on aeronautical charts

D. MOAs (Military Operation Areas)
   i. Consist of airspace established for the purpose of separating certain military training activity from IFR traffic
   ii. IFR traffic may be cleared through a MOA if IFR separation can be provided by ATC, otherwise ATC will reroute the traffic
   iii. There is no restriction against a pilot operating VFR in these areas
       a. A pilot should, although, be alert since training activities may include aerobatic and abrupt maneuvers
   iv. MOAs are depicted on aeronautical charts

E. Alert Areas
   i. Are to advise pilots that a high volume of pilot training or unusual aerial activity is taking place
   ii. They are depicted on aeronautical charts

F. Controlled Firing Areas
   i. Contain activities, which, if not conducted in a controlled environment, could be hazardous to nonparticipating aircraft
   ii. Activities here must be suspended when a spotter aircraft, radar, or ground lookout position indicates an aircraft might be approaching the area
   iii. No need to chart since they do not cause a nonparticipating aircraft to change its flight path

4. Other Airspace Areas

A. Airport Advisory Areas
   i. An area within 10 SM of an airport where a control tower is not operating, but where a FSS is located
   ii. At these locations, the FSS provides advisory service to arriving and departing aircraft

B. Military Training Routes
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i. Developed to allow the military to conduct low-altitude, high-speed training.
ii. The routes above 1,500 feet AGL are developed to be flown primarily under IFR, and the routes 1,500 feet AGL and less are for VFR flight
iii. The routes are identified on sectional charts by the designation “instrument (IR) or visual (VR)”

C. Temporary Flight Restrictions (TFRs)
   i. An FDC NOTAM will be issued to designate a TFR
      a. The NOTAM will begin with the phrase “FLIGHT RESTRICTIONS” followed by the location of the temporary restriction, effective time period, area defined in statute miles, and altitudes affected
      b. The NOTAM will also contain the FAA coordination facility and telephone number, the reason for the restriction, and any other information deemed appropriate
   ii. Purposes for establishing a TFR:
      a. Protect persons and property in the air or on the surface from an existing or imminent hazard
      b. Provide a safe environment for the operation of disaster relief aircraft
      c. Prevent an unsafe congestion of sightseeing aircraft above an incident or event, which may generate a high degree of public interest
      d. Protect declared national disasters for humanitarian reasons in Hawaii
      e. Protect the President, VP, or other public figures
      f. Provide a safe environment for space agency operations
   iii. Very important to check these before flying
      a. Very bad to fly through one accidentally

D. Parachute Jump Areas
   i. Published in the AFD
   ii. Frequently used sites are depicted on sectional charts

E. Published VFR Routes
   i. For transitioning around, under, or through some complex airspace
   ii. Also called: VFR flyway, VFR corridor, Class B airspace, VFR transition route, and terminal area VFR route
   iii. Generally found on VFR terminal area planning charts

F. Terminal Radar Service Areas (TRSA)
   i. Areas where participating pilots can receive additional radar services
   ii. The purpose is to provide separation between all IFR operations and participating VFR traffic
   iii. The primary airport(s) within the TRSA become Class D Airspace
      a. The remaining area of the TRSA overlies other controlled airspace, which is normally Class E Airspace at 700 or 1,200 feet and established to transition to/from the en route terminal environment
   iv. TRSAs are depicted on VFR sectional charts and terminal area charts with a solid black line and altitudes for each segment
      a. The Class D portion is charted with a blue segmented line
   v. Participation is voluntary
      a. However, VFR traffic is encouraged to use

G. National Security Areas
   i. Consists of airspace of defined vertical and lateral dimensions established at locations where there is a requirement for increased security and safety of ground facilities
   ii. Pilots are requested to voluntarily avoid flying through these depicted areas
   iii. When necessary, flight may be temporarily prohibited
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Conclusion:
Brief review of each main point
Overview of the differences based on airspace and traffic

PTS Requirements:
To determine that the applicant exhibits instructional knowledge of the elements of the national airspace system by describing:

1. Basic VFR weather minimums—for all classes of airspace.
2. Airspace classes—their operating rules, pilot certification, and airplane equipment requirements for the following:
   a. Class A.
   b. Class B.
   c. Class C.
   d. Class D.
   e. Class E.
   f. Class G.
3. Special use airspace (SUA).
4. Temporary flight restrictions (TFR).
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