A publication of the
National Wildfire Coordinating Group

NWCG Standards for Airspace Coordination

PMS 520 July 2023

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The *NWCG Standards for Airspace Coordination* standardizes safe, consistent approaches to issues involving airspace and agency land management responsibilities. This is an educational process that will contribute to a clear understanding of flight and coordination within the complexities of the National Airspace System (NAS). Additionally, it promotes airspace coordination with respect to environmental issues. The objectives of the *NWCG Standards for Airspace Coordination* are:

- Describe the components of the NAS and define airspace coordination responsibilities among the various agencies and users of the NAS.
- Describe the processes and procedures that an agency should employ so that users may:
  - Coordinate, deconflict, and conduct flight missions safely within the NAS with respect to safety concerns and operational requirements.
  - Coordinate, deconflict, and respond to airspace issues relating to the environment.
- Provide educational material aimed at both agency and military aviation and airspace managers that will contribute to a clear understanding of the complex nature of the airspace in which we all share.
- Identify airspace coordination responsibilities for agency personnel.

Table of Contents

Table of Figures

Tables

Chapter 1 – Introduction

Purpose

The Federal Aviation Administration (FAA) has been charged by Congress to administer and manage the national airspace in the public interest to ensure the safety of aircraft and the efficient utilization of airspace. The national airspace is a limited natural resource. Airspace users, rights, rules, and responsibilities are complex.

Airspace coordination and deconfliction is a shared responsibility among pilots, air traffic controllers, dispatchers, trainers, on-scene personnel, and managers of resources, operations, safety, and airspace. The primary focus in airspace coordination is mid-air collision avoidance. When performing most agency aviation tasks, the pilot's attention will be diverted out of the aircraft toward the ground, conflicting with their primary responsibility to "see and avoid" other aircraft or obstructions. Other users of this airspace may have similar workload distractions.

As airspace becomes more complex, effective processes are needed that will identify issues and facilitate coordination efforts. The FAA and Department of Defense (DoD) are our primary collaborative partners in minimizing risk during flight operations.

As always, it is the pilot's responsibility to comply with all FAA rules and regulations for flight through each type of airspace. The final responsibility for collision avoidance rests with the Pilot-in-Command (PIC) to "see and avoid."

An understanding and awareness of the procedures in this publication will improve aviation safety through coordinated use of the NAS. A consistent approach will maximize agency effectiveness and ensure compliance with the National Environmental Policy Act (NEPA) when responding to airspace proposals.

Background

The Interagency Airspace Coordination Guide revision was a result of a team effort involving the Department of Interior (DOI), United States Forest Service (USFS), DoD, and the FAA. The team decided it would best serve the participating agencies if educational material was included to explain the actions of the agencies with respect to airspace coordination. For example, material explaining the dispatching system was placed in the publication to facilitate DoD airspace managers' understanding of land management agency structure.

Note: The term "agency" used throughout the publication refers to land management agencies who use the publication (such as USFS), Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), National Park Service (NPS), Fish and Wildlife Service (FWS), etc.). The term "agency personnel" refers to land management personnel.

The target audience identified by the Airspace Guide Revision team includes an extensive list of users including:

- Agency personnel (aviation program managers, unit aviation officers, pilots, dispatchers, on-scene personnel, including Air Tactical Group Supervisors, Air Operations Branch Directors, Air Support Group Supervisors, Helicopter Managers, etc.).
- DoD airspace managers and schedulers.
- FAA personnel who interact with land management agencies.

Participating Agencies

The following agencies participated in the original development of this publication:

- USDA, Forest Service
- DOI, Office of Aviation Services
- DOI, Bureau of Land Management
- DOI, Fish and Wildlife Services
- DOI, Bureau of Indian Affairs
- DOI, National Park Service
- United States Navy
- United States Air Force
- Air National Guard and Reserves
- United States Army
- Participating States and local agencies
- Federal Aviation Administration

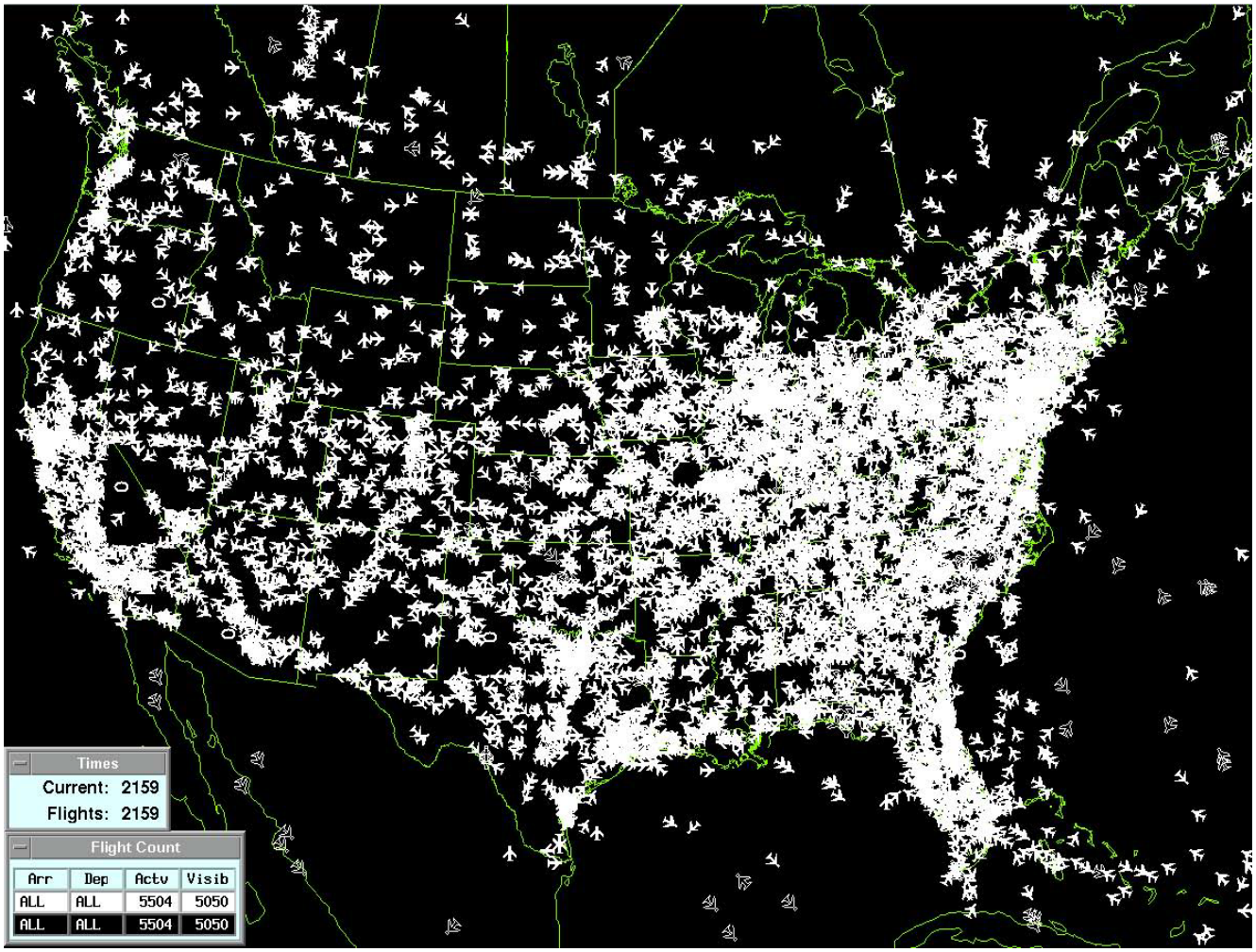


Figure 1-1: Example of Continental United States Aviation Traffic

Chapter 2 – Agency Organizations, Roles and Responsibilities, and Airspace Committees

Introduction

Flying safely is an ongoing responsibility of the PIC. Airspace management is the responsibility of the FAA and designated agencies, such as the DoD. Airspace coordination is the responsibility of multiple agencies including land management organizations. Specific agency missions result in diverse airspace and safety requirements with the end goal of resolving environmental issues. The following provides an overview of what agency users need to be familiar with in order to effectively coordinate airspace used by multiple agencies.

Federal Aviation Administration

The navigable airspace is a limited national resource that Congress has charged the FAA to administer in the public interest. Their overall goal is to ensure the safety of aircraft and the efficient use of the flight environment. Although the FAA must protect the public's right of freedom of transit through the airspace, full consideration must be given to all airspace users to include national defense; commercial and general aviation; and space operations. While a sincere effort must be made to negotiate solutions to conflicts over the use of the airspace for nonaviation purposes, the preservation of the navigable airspace for aviation must be the primary emphasis (FAA Order JO7400.2 April 3, 2014).

In the 1950s, the advent of jet airliner service and faster aircraft in ever-increasing numbers created new challenges and hazards along the nation's air routes. Congress passed the Federal Aviation Act in 1958 that created the Federal Aviation Agency. The FAA was subsequently renamed the Federal Aviation Administration in 1967.

The Federal Aviation Act of 1958 (as amended) gave the FAA exclusive responsibility for the safe and efficient management of all navigable airspace within the continental United States. The Act requires the FAA to consider the requirements of national defense, commercial aviation, general aviation, and the public right of freedom of transit through the navigable airspace.

FAA Facilities and Functions

The FAA operates under the Department of Transportation (DOT) and is organized with a national headquarters and subordinate regions. The boundaries for the FAA regions are shown in Figure 2-1. The FAA's Air Traffic Organization (ATO) is organized into three Service Centers which is depicted in Figure 2-2. FAA's national headquarters provides policies and new or updated Federal Aviation Regulations which apply to airports, air traffic, and airspace matters. Regional Headquarters are charged with administration and enforcement within their respective boundaries. The term Air Traffic Control, or "ATC" refers to any entity that controls air traffic in real-time via radio. These entities include the Air Route Traffic Control Centers (ARTCC), Terminal Radar Approach Controls (TRACON), and control towers which clear aircraft for taxi, takeoff, and landing at specific airports.

Figure 2-1: FAA Regional Office Boundaries

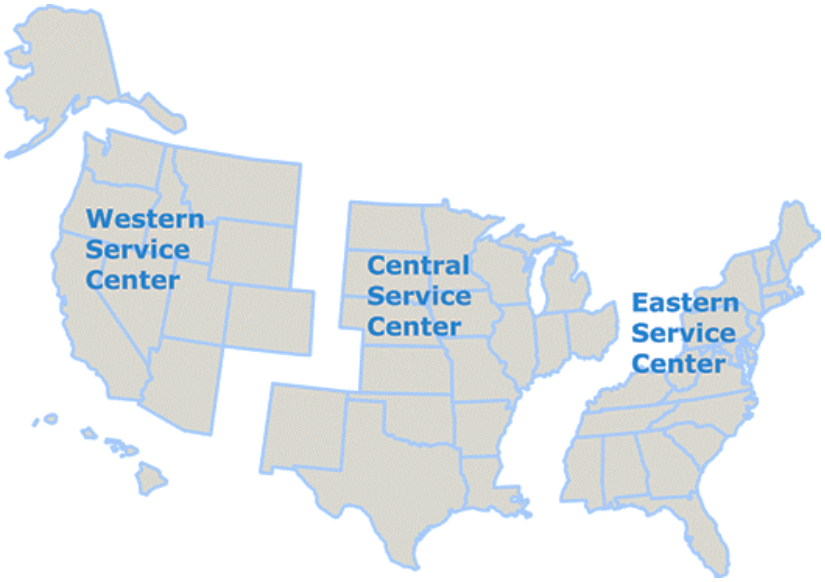


Figure 2-2: FAA ATO Service Centers

Air Route Traffic Control Center

The ARTCC is the FAA facility which is primarily responsible for separation and control of en route traffic operating under Instrument Flight Rules (IFR). An ARTCC is often referred to as "Center." Each ARTCC uses long range surveillance radar for tracking and control of aircraft. Some of the lower altitudes within an ARTCC are non-controlled due to radar coverage inconsistencies.

There are currently 22 ARTCC's in the United States. The boundaries for these ARTCCs are shown in Figure 2-3 below. On IFR en route Low/High Altitude Charts, the boundaries are depicted as a jagged blue colored line as shown in Figure 2-4. They are the initiating facilities for the regulatory 14 Code of Federal Regulations (CFR) 91.137 Temporary Flight Restrictions (TFRs). See Chapter 6 for TFR information.

Dispatch/coordination centers must know ARTCC boundary locations to submit requests for 91.137 TFRs to the correct ARTCC. Some dispatch centers have more than one ARTCC within their area of jurisdiction.

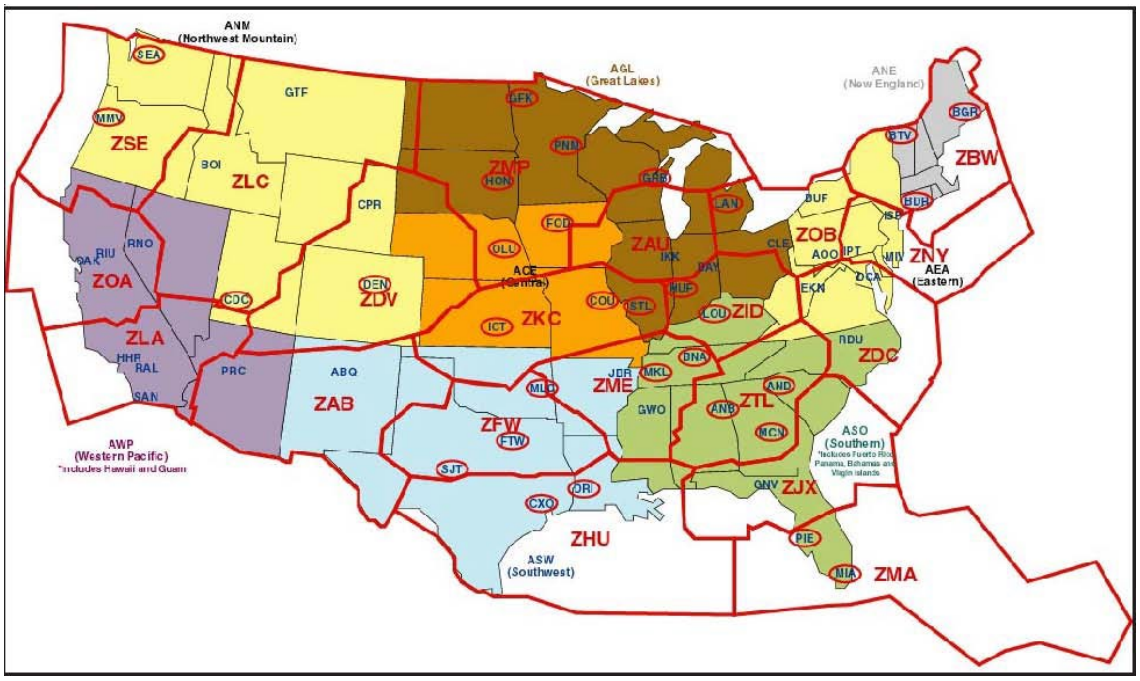


Figure 2-3: FAA ARTCC Boundaries over FAA Regional Boundaries

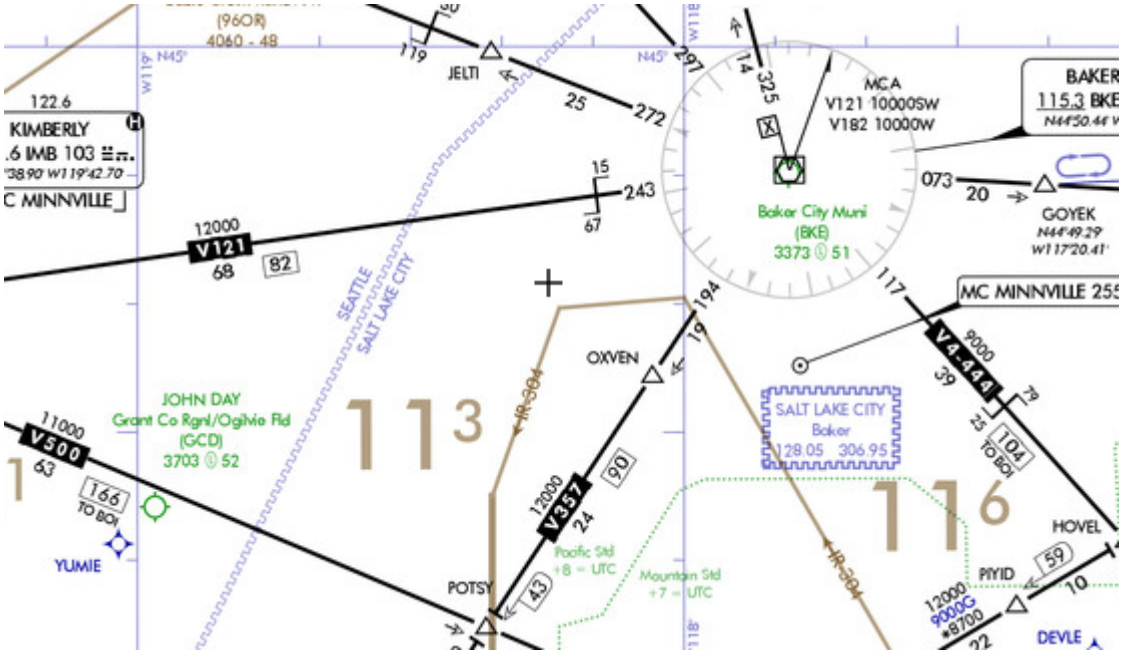


Figure 2-4: ARTCC Boundary Symbol on a Low Altitude IFR Chart

Terminal Radar Approach Control

TRACON facilities transition departing and arriving traffic between the en route system and the terminal environment. When an airport does not have an operating control tower, the TRACON may be the first or last ATC facility in contact with aircraft. In some areas, approach control service is provided by the military which uses the same ATC rules as an FAA TRACON. Radar Air Traffic Control Facility (RATCF–Navy), Radar Approach Control (RAPCON–Air Force), and Army Radar Approach Control (ARAC–Army) are examples of approach control facilities operated by the military.

Flight Service Station (FSS)

FSSs are either government or contract air traffic facilities that communicate directly with pilots to conduct preflight briefings, process flight plans, provide in-flight advisories, initiate search and rescue for overdue and missing aircraft, and provide general assistance to aircraft in emergencies. FSS may also relay ATC clearances and provide updates on aviation weather. FSS disseminates Notices to Air Missions (NOTAMs) with updates on the status of airports, navigation systems, and airspace including TFRs and Military Training Route (MTR) schedules. In addition, the FSS will receive and process requests for NOTAM (D) from agency personnel for situations that require notification to pilots. For further information, see Chapter 6.

Flight Standard District Offices (FSDOs)

FSDOs are the FAA field operating units of each region; they provide education, inspections, investigations, and enforcement of Federal Aviation Regulations. The FSDO is the office which conducts the primary investigation of pilot deviations (e.g., entering a TFR without permission) and near mid-air collision (NMAC) reports. See Chapter 8 for further discussion of these reports.

Law Enforcement Assistance Program (LEAP)

The FAA's LEAP consists of field investigative and operational activities that support federal, state, and local agencies by denying anyone who would threaten national security access to the NAS. They take regulatory enforcement actions and (as appropriate) provide aviation-related training and support for law enforcement agencies involved in airborne drug interdiction, criminal prosecution, etc. LEAP is a function of FAA headquarters Office of Investigations, and special agents assigned to regional security divisions, centers, and field offices. This office will work with agency or local law enforcement with the investigation of a TFR intrusion (or careless and reckless flying) by crewed and uncrewed aircraft operators.

The United States NOTAM Office (USNOF)

The USNOF is the authority for ensuring NOTAM formats comply with the criteria and procedures set forth in FAA Order 7930P. When questions arise on NOTAM dissemination, formats, contractions, or other aspects of the distribution system, the USNOF should be consulted. To ensure NOTAMs are issued consistent with policy, NOTAM originators, and certified sources must comply with USNOF personnel guidance.

The National Flight Data Center (NFDC)

The NFDC is part of the FAA's Aeronautical Information Services group. NFDC is responsible for the collection, validation, and quality control of aeronautical information that is disseminated to support NAS operations detailing the physical description, geographical position, and operational characteristics, and status of all components of the NAS. NFDC aeronautical information is used to develop and update Instrument Approach Procedures, digital products, aeronautical charts, and related publications.

The NFDC disseminates aeronautical information in accordance with standards established by the International Civil Aviation Organization (ICAO). Flight Data Center (FDC) NOTAMs are regulatory in nature, such as changes to an instrument approach procedure. TFRs are FDC NOTAMs.

Department of Defense

The DoD service branches (Army, Navy, Marine Corps and Air Force) must continually train their aviators with a wide variety of tactics in a variety of environments. With FAA concurrence, specific areas, and routes have been established to provide airspace necessary for the military mission. In most cases, these areas and routes are represented on a number of aviation charts to inform the public that increased vigilance and alertness are required due to the possibility of military aircraft operating in the area; while exercising the "see and avoid" concept of Visual Flight Rules (VFR). In addition, charting may provide segregation for hazardous ground operations. Each of the DoD service branches have flight rules and policies in addition to the Federal Aviation Regulations.

In airspace coordination, it is crucial to understand the various kinds of airspace in which the DoD flies and how to contact the appropriate DoD facility that schedules the airspace. The types of airspace that DoD typically uses is covered in Chapter 3. The following DoD personnel are key contacts in airspace coordination.

Military Representative to the FAA (MilReps)

Each military service has designated personnel located within FAA Service Centers to facilitate coordination with the FAA on air traffic and airspace issues. These personnel are referred to as AFREPS (Air Force and Air National Guard), NAVREPS (Navy/Marine Corps) and DARR (Department of Army). The MilReps are frequently a good starting point for locating military points of contact when dealing with airspace issues.

The MilReps also provide guidance and services to their assigned military units to coordinate creation and changes to airspace. They also serve as a focal point for disseminating information concerning hazards to navigation and other general airspace information. MilReps commonly deal with the following issues: noise complaints, flight violation reports, airspace proposals, Environmental Impact Statement (EIS)/Environmental Assessment (EA) scoping meetings, and airspace user forums. They provide an interface with land management agencies and serve as liaison to state, local, and other government agencies.

Additionally, each DoD Service Branch provides representation at FAA Headquarters in Washington, D.C.

1) Air Force Representative (AFREP)

   Regional AFREPs are established at FAA Service Centers. Each AFREP represents the Department of the Air Force (USAF) and the Air National Guard (ANG) Commands through liaison with the FAA. They are authorized to coordinate, negotiate, and communicate USAF/ANG positions on airspace and ATC matters within established policy and guidelines. The AFREPs represent the USAF in negotiations with competing aviation and land-use interests and assists with airspace proposals and environmental documents.

2) Navy Representative (NAVREP)

Navy Representatives to the FAA (NAVREPs) represent the Navy and Marine Corp and are located at FAA Service Centers. They provide liaison between the FAA and the Department of the Navy (DON), assuring that regional DON airspace matters are consistent with national DON policy. NAVREPs provide technical guidance and procedural assistance in matters such as sonic boom or jet noise complaints, flight violation reports, near mid-air collision reports, TFR intrusions, and airspace proposals.

3) Army Representative (DARR)

Department of the Army Representatives to the FAA (DARR) serve at FAA Service Centers and provide assistance to local Army commands. This includes coordination of air traffic and airspace actions with the FAA Regional Headquarters as well as the investigation of flight violations involving Army assigned airspace and aircraft. They provide local Army commanders with technical expertise and assistance in areas that significantly affect Army airspace, ATC, aeronautical information, aviation matters, and Special Use Airspace. They are the liaison with land management agencies in coordinating airspace issues. Additional information is available at Army Aeronautical Services Agency.

Other Sources of Assistance Within DoD and the FAA

1) DoD Unit Airspace Manager

Airspace managers have been assigned at some military facilities who are responsible for working with the FAA and other agencies to identify, coordinate, procure and manage airspace, and to develop and coordinate agreements/procedures to support military flight operations to meet both peace and war time requirements.

2) FAA Air Traffic Representative (ATRep)

An ATRep is an FAA Air Traffic Representative. Some military facilities have an ATRep assigned to serve as a liaison officer between the military and the FAA and between the military and civil users. They serve as a technical advisor in all phases of air traffic control in order to improve ATC service, evaluate the amount of airspace required for ATC and coordinate approval of airport traffic patterns. They participate in appropriate intra-military meetings in which the FAA has an interest, encourage lecture and training programs for base pilots and civil air user groups, and recommend changes, if necessary, to improve service. ATReps can be useful resources in coordinating with a DoD facility regarding specific airspace issues.

Using, Controlling and Scheduling Agency for SUA/Scheduling Activities for MTRs

MTRs and Special Use Airspace (SUA) must be scheduled for use by DoD aircraft. DoD schedulers are tasked as either Scheduling Activities for MTRs or Scheduling Agency for SUAs. Schedulers are the front-line resources that dispatch calls to deconflict or share airspace coordination information. The offices are listed on sectionals or DoD AP/1A for SUAs, and the DoD AP/1B Handbook for MTRs, Slow Routes, and Aerial Refueling Routes.

When coordinating with DoD facilities regarding airspace issues, the following organizational terminology applies:

1) Using Agency

   The Using Agency is that agency or military command organization designated by the FAA as responsible for the administration and management of the designated SUA/MTR. Normally, this is the cosigner(s) on the Interagency Airspace Agreement for the SUA/MTR.

2) Scheduling Agency/Activity

   The Scheduling Agency/Activity is that organization responsible for scheduling and day-to-day administration of the SUA or MTR on behalf of the Using Agency. The Scheduling Agency may be the same as the Using Agency or may be a delegated organization. Airspace will not be used for military activities unless scheduled by the responsible military office. There may also be an alternate Scheduling Agency/Activity for after-hours or weekend coordination. Note that the:

   - Scheduling Agency is the DoD term associated with SUA.
   - Scheduling Activity is the DoD term associated with MTRs.

3) Controlling Agency

   The Controlling Agency is the FAA or military designated facility responsible for ATC for a SUA. The controlling agency could either be an ARTCC responsibility, a TRACON facility, or a military RAPCON facility. Controlling agencies for SUAs are listed on the legend of a sectional chart or in the DoD AP/1A.

Land Management Agencies (USFS, DOI, and States)

The United States Congress has charged the federal land management agencies, primarily the USFS, and bureaus of the DOI, to administer public lands in the public interest. Similar responsibilities are assigned to state agencies. Although not a regulator of airspace, the land management agencies operate within the airspace above public lands in the administration of public service. As users of the NAS, agency flights are bound by the Federal Aviation Regulations. Many of their flights are primarily conducted at the same altitudes at which the military trains, and general aviation operates.

Most federal land management agencies (both USFS and DOI) have headquarter offices in Washington, D.C. They are further divided by region, area, or state, with subunits of these divided into National Forests (USFS), districts (BLM), reservations (BIA), National Parks and Monuments (NPS), and National Wildlife Refuges (FWS). Maps of the boundaries for these agencies may be found on the internet.

Not all government agencies are alike in organization or structure. Roles and responsibilities will overlap in some cases and differ in others.

Land Management Dispatch/Wildland Fire Logistical Support Organizations

Land management agencies that manage natural resources have a designated ordering procedure to support wildland fire use and suppression as well as natural disasters. Wildland fires and natural disasters are called “incidents” and are frequently managed using the Incident Command System (ICS). Associated with ICS are established ordering channels that provide for rapid movement of personnel, aircraft, and equipment in an efficient and effective manner to support incidents. There are three primary levels of coordination centers: national, geographic area, and local.

1) National Interagency Fire Center (NIFC)

The National Interagency Fire Center in Boise, Idaho, is the nation's support center for wildland firefighting. Eight different agencies and organizations are part of NIFC. Working together and in cooperation with state and local agencies, NIFC's role is to provide national response to wildfire and other emergencies, and to serve as a focal point for wildland fire information and technology. NIFC is home of the National Interagency Coordination Center (NICC.)

2) National Interagency Coordination Center

NICC is the focal point for overseeing all interagency coordination activities throughout the United States. NICC coordinates the mobilization of resources for wildland fire and other incidents throughout the United States. Located in Boise, Idaho, the NICC also provides Intelligence and Predictive Services related products designed to be used by the internal wildland fire community for wildland fire and incident management decision-making.

NICC is responsible for coordination and support of all resource movement between the Geographic Area Coordination Centers (GACCs) that are not covered by local operating plans.

3) Geographic Area Coordination Centers

The United States and Alaska are divided into 10 GACCs for the purpose of incident management and mobilization of resources (people, aircraft, and ground firefighting equipment). Working collaboratively, the GACC's mission is to provide leadership and support not only for wildland fire emergencies, but to other emergency incidents (e.g., earthquakes, floods, hurricanes, tornadoes, etc.), as necessary.

The primary mission of the GACC is to serve federal and state wildland fire agencies through logistical coordination and mobilization of resources (people, aircraft, and ground equipment) both internally throughout the geographical area, and to/from other geographic areas of the United States through NICC. GACCs also have support programs in predictive services, intelligence, and fire information.

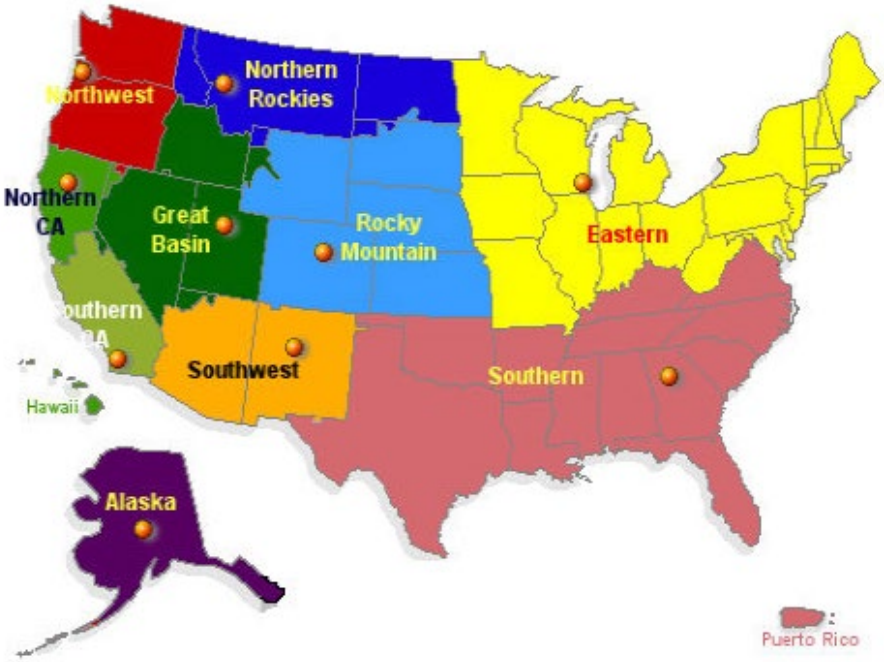


Figure 2-5: GACCs

4) Local Dispatch Coordination Centers

Dispatch responsibilities for initial attack are usually coordinated on a local level. Many dispatch offices are organized on an interagency basis to facilitate the "closest forces response concept" for resource assignment. Many dispatch offices at this level of responsibility initiate TFR requests and assist in coordinating airspace deconfliction.

Dispatch Organization and Ordering Channels

All agencies have designated ordering procedures for incidents and wildland fire support and services. These established ordering channels provide for: rapid movement of resources and cost effectiveness. These communications occur between dispatch centers, GACCs, and the NICC. NICC is responsible for coordinating the movement of all resources between geographical areas not covered by local operating plans.

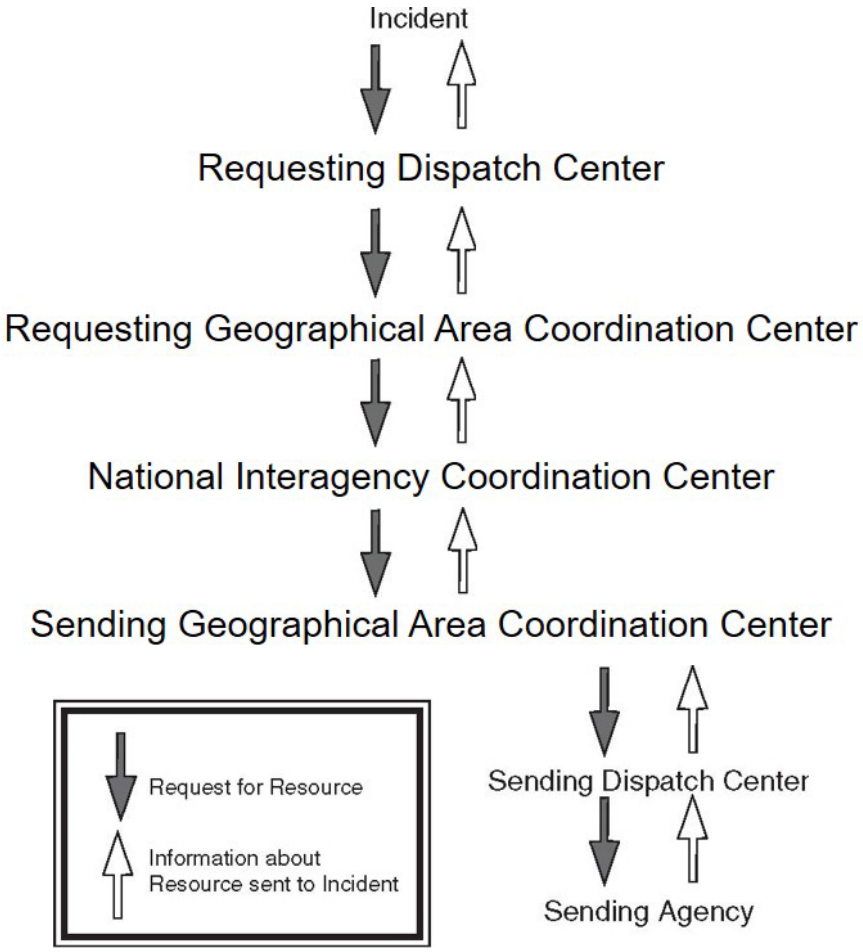


Figure 2-6: Dispatch Organization and Ordering Channels

Land Management Agencies Roles and Responsibilities

Airspace coordination is the responsibility of multiple agencies including land management agencies. Specific agency missions result in some diversity of airspace and safety requirements. The airspace above public lands is not owned by the agencies and proper coordination is a key to safe use.

The following provides an overview of the roles and responsibilities of land management organizations who are involved in airspace coordination.

State/Regional Aviation Manager

State or regional aviation managers provide leadership and oversight for agency airspace programs. If one is not available, consult with a national aviation program manager. Where appropriate, the state/regional aviation manager has the responsibility to:

1) Evaluate the airspace system and any potential issues.
2) Coordinate with the FAA, military, etc., in regard to airspace coordination issues.
3) Coordinate with other cooperating federal and state land management agencies to initiate airspace agreements with military facilities. Disseminate and discuss airspace coordination policy and procedures with local military bases, law enforcement, news media, and the FAA.
4) Ensure that all dispatchers, aviation managers, and other appropriate personnel receive training in airspace coordination policy and procedures.
5) Analyze airspace-related Aviation Safety Communique (SAFECOM) reports and discuss with DoD and FAA as appropriate.
6) When airspace activities affect environmental resources or land management activities, coordinate with local aviation managers, resource managers, and military airspace managers. Review airspace and environmental proposals (i.e., EAs and Environmental Impact Studies) for agency aviation concerns. Relay aviation concerns via the FAA comment process or through the NEPA process.
7) Brief agency planners and natural resource managers about any current or proposed airspace structure over agency lands.
8) Maintain awareness of local aeronautical issues (new airports, obstructions, noise abatement procedures, local general aviation events, etc.) that may have an impact on airspace and agency aviation operations.

Agency Resource Managers

Agency resource managers provide management of natural and cultural resources on public lands. This can include federally designated Wilderness, Wild and Scenic rivers, National Recreational Areas, and congressional designated areas. Where appropriate, the Agency Resource Manager has the responsibility to:

1) Review airspace, environmental proposals, and aviation projects that may affect environmental resource management. Coordinate with aviation managers and military facilities to mitigate potential impacts of airspace activities on environmental resources.
2) Provide technical advice on proposals to construct towers, wind farms, etc. See Chapter 4 for further information regarding obstruction evaluations and approvals as prescribed by the FAA.

National Interagency Coordination Center (NICC)

NICC coordinates and supports operations for managing wildland fire suppression and natural disasters throughout the United States. NICC receives resource orders for Airspace Coordinators (ASCOs) when the position cannot be filled on a local geographic basis.

Geographic Area Coordination Center

Note: Some GACCs have little to no involvement in airspace coordination while others are heavily involved on a daily basis due to their standard operation procedures. For questions regarding airspace, contact the appropriate GACC Aircraft Coordinator.

The GACC (or local dispatch center) will:

1) Deconflict SUA and MTRs with DoD as needed and coordinate TFR requests with the FAA.
2) Coordinate with appropriate incident Air Operations Branch Directors (AOBD) and the FAA ARTCC to design and manage large TFRs or multiple adjoining fire TFRs, to ensure they do not conflict or overlap.
3) Publish daily TFR information through intelligence reports or GACC websites. Immediately relay information of documented conflicts received from local unit dispatchers or aviation managers to the appropriate state or regional aviation manager.
4) Develop a comprehensive listing of phone and fax numbers for the MTRs, SUAs, and FAA facilities within its jurisdiction.
5) Maintain current sets of aeronautical sectional charts and the DoD AP/1B Handbook and charts.
6) Request an ASCO when the current wildfire situation involves airspace complexities or when the workload exceeds local/regional capacity. ASCO responsibilities are described later in this chapter.

Aviation Position Titles Involved in Airspace

The following may be useful in identifying individual titles with aviation responsibilities.

<u>DoD and FAA Airspace Titles:</u>

ATRep – FAA Air Traffic Representative to a DoD facility

AFREP – U.S. Air Force Representative to the FAA

NAVREP – U.S. Navy Representative to the FAA

DARR – Department of Army Regional Representative to the FAA

Airspace Manager – DoD Unit or Base Airspace Manager

<u>Land Management Agencies Aviation Titles:</u>

Refers to agencies with government responsibilities that include aviation activities–a partial list includes:

State Aviation Manager–BLM

Regional Aviation Manager–NPS

Regional Aviation Officer–(RAO) - USFS

Regional Aviation Safety Manager (RASM) - USFS

Unit Aviation Manager (UAM) – (may also be called a Forest or Unit Aviation Officer, or a District/Zone Aviation Manager)

Dispatch Titles:

Initial Attack Dispatchers

Aircraft Dispatcher/Aircraft Coordinator

Operations Coordinators

Support Dispatchers (Overhead, Crews, Equipment)

Supervisory Dispatchers

Logistics Coordinators

"On-Scene" Personnel (Tactical personnel located on an incident):

Airspace Coordinator

Helicopter Manager

Helispot Manager

Helibase Manager

Air Tactical Group Supervisor (also referred to as the "Air Attack" or "Aerial Supervisor")

Helicopter Coordinator (HLCO)

Lead Plane Pilot

Aerial Supervision Module (ASM)

Air Support Group Supervisor (ASGS)

Air Operations Branch Director (AOBD)

Fixed-Wing Base Manager

Airtanker Base Manager

Smokejumpers, Spotters

Helicopter Rappellers

Ramp Managers

Airtanker Pilots

Helicopter Pilots

Reconnaissance Aerial Observers

Resource Managers:

Wild and Scenic River Coordinators

Wilderness Specialists

Special Use Permit Specialists

Wildlife Biologists

Forest Insect Disease Specialists

Aerial Photography Specialists

Law Enforcement Specialists

Rangeland Mgt. Specialists

Wild Horse and Burro Specialists

Resource Advisors

Local Dispatch and/or Aviation Staff

During normal day-to-day operations, airspace coordination with the FAA and the DoD may be a local responsibility. Where appropriate, local dispatchers and/or aviation managers have the responsibility to:

1) Maintain airspace awareness and communicate any potential airspace issues within their area of jurisdiction.
2) Coordinate TFRs and other NOTAMs by:
    a. Relaying information regarding known airspace hazards or concerns to pilots and on-scene aviation personnel. Ensure that radio frequencies are distributed to expedite communications over an incident. Utilize an airspace boundary plan.
    b. Evaluating the need for TFRs and/or NOTAMs and coordinate requests. Obtaining complete information and documentation to meet FAA's needs as described in Chapter 6.
    c. Forward TFR and NOTAM requests to the GACC (when appropriate) and notify other affected agencies such as neighboring land management agencies and DoD. Document requests via agency procedures (i.e., resource orders, TFR Request Form, etc.).
    d. Modify TFR and NOTAM requests as needed. Coordinate modifications with on-scene personnel and determine the appropriate dimensions of the TFR as the incident size changes. Submit requests for a NOTAM modification if the incident air-to-air frequency changes.
    e. Verify TFR NOTAMs are published as requested and take immediate action to correct errors.
    f. Notify agency pilots and other affected personnel that TFR NOTAMs are in place. This may include helibases, airtanker bases, incident command posts, adjacent dispatch offices, airports, local military units, etc.
    g. Brief participating aircraft on procedures and points of contact for entering airspace. Brief incoming Incident Management Teams (IMTs), AOBDs, Area Command Teams, flight crews, and other aviation personnel on airspace issues, TFRs, deconfliction, hazards, etc.
    h. Cancel TFR NOTAMs when the restriction is no longer necessary. Coordinate with the on-scene official in charge (i.e., IMT AOBD) and notify the ARTCC.
3) Document all Near Mid-Air Collisions and TFR intrusions. Immediately notify the FAA (ARTCC), the military (if appropriate), and the state or regional aviation manager of any such events. Document all airspace issues in a SAFECOM.
4) Notify affected agencies and personnel of airspace activities, hazards, frequencies, and airspace coordination procedures when a TFR or NOTAM is not issued. Participate in local air base or flight crew briefings as appropriate.
5) Develop and utilize a comprehensive list of phone numbers for contacting MTR and SUA schedulers, and any FAA facilities within unit jurisdiction.
6) Address airspace activities that may impact environmental resources and land management activities by coordinating with resource managers, military airspace managers, etc.
7) Acquire knowledge of the national airspace and NOTAM systems; maintain current references including aeronautical sectional charts and the DoD AP/1B book and charts. Maintain aviation hazard maps.
8) Deconflict airspace for non-emergency activities (i.e., blasting, prescribed burning, etc.).

Pilot

As a user of the NAS, pilots must fly in accordance with 14 CFR, Federal Aviation Regulations. Pilots who fly for land management agencies must also comply with agency regulations, procedures, and contractual clauses (if operating under a government contract). Where appropriate, the pilot has the responsibility to:

1) Be familiar with all available information concerning the flight including that which pertains to the airspace involved in the area of operations. Determine the status of SUAs/MTRs prior to flight near or within operational airspace. Participate in agency briefings and debriefings.
2) Report airspace conflicts to the aerial supervisor, dispatch, or the appropriate agency aviation manager(s) Using Agency or contractual reporting procedures. Document events in a SAFECOM.
3) Utilize transponder to make your position and altitude known to ATC for deconfliction. Use the national fire transponder code (1255) when appropriate.
4) Be familiar with agency procedures for flight following, dispatch coordination, and the communication protocols for entering the incident airspace using the procedures outlined in the *NWCG Standards for Aerial Supervision*, PMS 505, https://www.nwcg.gov/publications/505, for operations in a Fire Traffic Area (FTA).
5) When flying on incidents where a TFR is in place, follow established FTA procedures:
    a. Remain clear of incident TFRs when not assigned, unless otherwise authorized by the aerial supervisor in charge of the incident air operation.
    b. Establish contact with the aerial supervisor when assigned to an incident for the assignment of entry points, aircraft routes, orbit altitudes, frequencies, etc.
    c. Maintain assigned altitude or block assigned altitude unless otherwise cleared by the aerial supervisor.

    When arriving at a fire that does not have an aerial supervisor currently operating over the incident, establish contact with other pilots, the designated air-to-ground contact, or the incident commander for tactical assignments. In the absence of aerial or ground personnel, contact dispatch to acquire situational awareness of any aircraft activity or other hazards (towers, wires, etc.) in the incident airspace.

The PIC of an aircraft is responsible for, and is the final authority as to, the operation of that aircraft. In an in-flight emergency requiring immediate action, the PIC may deviate from any rule of this part to the extent required to meet that emergency. (14 CFR 91.3).

On-Scene Personnel

On-scene personnel include, but are not limited to, aerial observers, aircraft managers, project aviation managers, Aerial Supervisors, AOBD, ASGS, helitack personnel, Division/Group Supervisors, and Incident Commanders. When appropriate, on-scene personnel have the responsibility to:

1) Maintain knowledge and awareness of the airspace in which they are operating. Obtain or conduct briefings regarding incident airspace and associated hazards (i.e., MTRs, SUA, obstructions, etc.).

2) Provide accurate information to local dispatchers, ASCO, or aviation managers to request or modify a TFR. Relay change requests or updates relating to:
    - Incident location (latitude and longitude),
    - Frequencies,
    - TFR center point and radius if circular, or the corner coordinates if non-circular,
    - TFR ceiling altitude mean sea level (MSL),
    - Special considerations (for local airports and those in Class B, C, or D airspace),
    - Initial points for entry into a TFR and,
    - Potential for incident growth.
3) Brief responding and on-scene pilots about TFRs and known airspace hazards. Encourage lights on (strobe and pulsating lights) for safety.
4) Be familiar with agency procedures regarding aircraft entry into incident airspace.
5) When operations within incident airspace become unsafe, ensure that operations are temporarily suspended until unsafe situation is mitigated. Document unsafe situations with a SAFECOM.
6) When releasing aircraft from the incident, brief pilots regarding TFRs at other sites so they may avoid intrusions.
7) Consult with agency aviation personnel when risk assessment indicates the need for an FAA Temporary Tower.
8) Keep dispatch updated when agency flight operations escalate, change, or cease. Request new frequencies as needed and release frequencies when no longer needed.

Aerial Supervisor

The aerial supervisor is responsible for the assignment of all incident aircraft in safe orderly holding and mission flight patterns and routes. An aerial supervisor is normally an Air Tactical Group Supervisor (ATGS), but may also be an ASM, Helicopter Coordinator (HLCO), or Lead Plane Pilot. In addition to the on-scene responsibility of directing air traffic, the aerial supervisor will perform the responsibilities outlined in the *NWCG Standards for Aerial Supervision*, PMS 505. The airspace coordination responsibilities of an aerial supervisor include:

1) Conducting a briefing each morning that provides updated, accurate airspace information regarding TFRs, ingress, egress, etc. (**Note:** May be performed by Airtanker Base Manager, or Helibase Manager.) Briefings are covered in Chapter 7.
2) Following established agency procedures for entering and exiting the airspace.
3) Giving and requesting position reports within the incident airspace. Assigning flight patterns, routes, and checkpoints to establish safe vertical and horizontal separation as outlined in *NWCG Standards for Aerial Supervision*, PMS 505.
4) Advising pilots of other air traffic and flight hazards.
5) Maintaining radio communication; monitoring the status of all assigned aircraft in the airspace.
6) Maintaining visual separation and communicating position reports. Sequencing aircraft for safe and efficient operations.

7) Coordinating media, VIP, local emergency medical services (EMS), and other agency flights within TFR(s).

8) Conducting debriefings and recommending any necessary corrective actions regarding airspace, documenting issues in a SAFECOM as needed.

Airspace Coordinator (ASCO)

An ASCO may be ordered to assume or assist with airspace duties within a GACC, Regional Office, State Office, or Area Command. Their primary role is to assist IMTs and coordinate with the FAA, DoD, and local agency dispatch centers within the GACC.

An ASCO should be ordered when incident activity is widespread and involves a number of complex TFRs, complex airspace is involved, or difficult conflict resolutions exist with various agencies. Many GACCs request an ASCO when they have six or more TFRs in their geographic area. An ASCO may be ordered when the press of immediate tasks by aircraft dispatchers preclude appropriate attention to airspace issues. The position interacts with dispatch organizations, local airports, general aviation, FAA ARTCCs, the U.S. NOTAM Office, FAA Flight Service Stations, FAA Flight Standards District Offices, Fly In organizers, and DoD Scheduling offices for SUA and MTRs. They have extensive aviation backgrounds to facilitate coordinating airspace activity.

An Airspace Coordinator has responsibility to:

1) Assess the airspace situation and the impact that fire operations are having on specific FAA classes of airspace, ATC arrival and departure procedures, SUA and MTRs, and other users of the national airspace. Contact ARTCCs to discuss the incident situation, airspace coordination, and TFR procedures. Ensure effective deconfliction has been performed (i.e., by local or regional dispatch offices).

2) Know how to use the latest airspace coordination tools such as web-based TFR map building applications, Automated Flight Following (AFF), and the Enterprise Geospatial Portal (EGP) which depicts satellite heat signatures and fire perimeters. Maintain user profiles and proficiency in the FAA applications such as the NOTAM Entry System (NES), ENII, and the Federal NOTAM System (FNS). Be proficient in converting latitude and longitudes from decimal minutes or decimal degrees into the FAA-required format of degrees, minutes, and seconds.

3) Coordinate the ordering of TFRs with dispatch; acquire an A# (Aircraft Resource Order) for documenting each TFR. Maintain a log of all airspace discussions (for legal purposes).

4) Disseminate a list of daily TFRs and/or area GIS maps (when available) that depict the location and NOTAM numbers for all TFRs in the GACC. Data sheets for new TFRs should be sent to AOBDs, dispatch centers, and unit aviation managers that show the FAA map and NOTAM information for each new TFR. When able, provide maps to local fixed base operators (FBOs) and pilot organizations, and other airspace users affected by a TFR.

5) Coordinate with incident AOBDs and frequency coordinators when combining one or more incidents into a single TFR, or when constructing adjoining polygons that have a shared TFR boundary. Anticipate the need to proactively modify TFRs and consult with AOBDs on a timely basis. Initiate suggestions when activity is winding down, and a TFR could be reduced in size or cancelled.

6) Obtain copies of any airspace agreements involving land management agencies and military entities. Contact the Military Scheduling Activity office (MTRs) or Controlling Agencies (SUAs) to provide briefings and discuss deconfliction procedures or intrusions.

7) Carefully check published NOTAMs to ensure they match the submitted TFR request to verify for accuracy.

8) Coordinate with ASCOs in adjoining GACCs when TFRs are located on or near GACC boundaries, or if an IMT needs to enlarge a TFR that will cross into an adjoining GACC.

9) Coordinate with other agencies and cooperators (such as power companies conducting fire damage surveys) that may need to fly within the TFR. Establish contact with the respective AOBD and coordinate the agency's request for entry. Flights that are not related to the fire suppression or response effort are considered nonparticipating aircraft and should only be allowed into a TFR when it is not active, such as in the early morning hours before a "daily hours" TFR goes into effect. The FAA has established provisions for accredited news media agencies and law enforcement to enter disaster TFRs via 14 CFR Part 91.137(c.).

10) Process reports of any TFR intrusions to ensure ARTCC has been notified. Ensure agency aviation managers and aviation safety managers are notified. If the military is responsible for a TFR intrusion, ask for assistance from the appropriate scheduling activity, military airspace controllers, or the Military Operations Specialist (MOS) assigned to the ARTCC. Document all TFR intrusions via SAFECOM.

11) Provide a daily briefing as needed for the following stakeholders:

    a. Agency aviation managers, dispatchers, airtanker bases, helibases, smokejumper and rappel bases, and adjoining GACC Airspace Coordinators.

    b. Incident AOBDs, Aerial Supervisors, and Area Command teams.

    c. Local airport managers and general aviation (GA) user organizations. Where appropriate, coordinate the distribution of airspace maps and TFR posters that highlight the safety benefits of staying away from TFRs.

    d. FAA ATC facilities (ARTCC, TRACON, FAA Towers, etc.).

    e. Affected DoD Bases and MilReps (AFREP, NAVREP, ATREP, etc.)

    f. Local media agency pilots (media requests for fire information should be forwarded to the Fire Information Officer or local public affairs office).

12) Assist dispatch centers and incident AOBDs with requests for temporary towers. Additional information is available in Chapter 11.

13) Coordinate with the FAA and other agencies (i.e., Secret Service) when a Presidential or VIP TFR is established in or near an area with incident or agency aviation activity. VIP visits create an elevated level of complexity to airspace coordination. VIP TFR NOTAMs, which are issued under 14 CFR Part 91.141, will normally contain a clause that allows firefighting and other emergency aircraft operations to continue to operate under some specific instructions listed in the NOTAM. A Special Agent in charge will be assigned to work with the FAA ATC facility (ARTCC, TRACON, or local tower) that has jurisdiction over the affected airspace. The ASCO and/or GACC Aircraft Coordinator must coordinate with the Special Agent to facilitate the incident's continued use of the airspace. Pilots may receive additional or alternative instructions from ATC in real-time when the VIP TFR is in effect.

14) Maintain positive working relationships with the individuals, groups, and organizations described above. The ASCO is the primary point of contact for any land management agency that is using and sharing airspace with other users.

Airspace Coordination Groups and Committees

Either through acts of Congress, delegations of the military, or public interest, several airspace committees have been created to encourage interagency involvement and cooperation between agencies and public interest groups.

Interagency Airspace Subcommittee

The Interagency Airspace Subcommittee (IASC) provides guidance for and standardization of airspace issues in aviation operations. The committee supports aviation programs including firefighting, resource management, uncrewed aircraft operations, and all risk response. The IASC is the focal point for all interagency airspace coordination initiatives, proposals, and issues. The IASC reports to the National Interagency Aviation Committee (NIAC) under NWCG. Representatives are appointed by their respective agency members on NIAC which consist of the USFS, BLM, NPS, USFWS, BIA, Office of Aviation Services (OAS), and the National Association of State Foresters.

Interagency Airspace Natural Resource Coordination Group (IANRCG)

The IANRCG was formed in 1994 upon direction of the Senate Armed Services Committee to the Secretaries of Defense and the Interior to resolve airspace conflicts between the DoD, USFS, and the DOI agencies. The IANRCG provided a forum for interagency discussion, integrated planning, collaborative dispute resolution, and facilitation of local, and regional airspace issues. IANRCG resolved many airspace issues within DOI such as the noise issues at the numerous National Parks and U.S. Fish and Wildlife refuges. IANRCG also participated in the development of the 2003 Interagency Airspace Coordination Guide. The group became inactive when the U.S. Air Force Airspace and Range Councils (ARCs) meetings began to offer the opportunity for local resolution of airspace issues.

USAF/ANG ARCs Meetings

The ARC's meetings began to occur in 1989 and were formally endorsed by USAF Headquarters in 1995. These meetings ensure Air Force and ANG offices involved have a mutual understanding of agency objectives and key issues and provide an environment that encourages interagency involvement and cooperation to resolve airspace issues. The meetings are open to participants from all branches of the military services, land management agencies, and other interested, or concerned parties. Agency personnel are highly encouraged to attend ARC meetings to learn about the airspace issues that occur in the airspace above their units and make connections with local, regional, and national DoD airspace managers.

Federal Interagency Committee on Aviation Noise (FICAN)

FICAN was formed in 1993 to provide a forum for debating future research needs to better understand, predict, and control the effects of aviation noise. DOT, DoD, National Aeronautics and Space Administration (NASA), Environmental Protection Agency (EPA), Housing and Urban Development (HUD), and NPS conduct significant research on aviation noise. They are represented on FICAN along with agencies such as HUD and EPA that have broad policy roles with respect to aviation noise.

DOT/NPS Interagency Working Group (IWG)

In 1987, Congress enacted Public Law 100-91, known as the National Parks Overflights Act. It required both the USFS and the NPS to submit reports to Congress on the effects of overflights on USFS Wilderness areas and impacts to National Park resources and visitor experiences. NPS worked with the FAA to develop and issue a final plan to manage air traffic above the Grand Canyon.

On December 22, 1993, the Secretary of Transportation (Pena) and the Secretary of the Interior (Babbitt) formed an IWG to explore ways to further limit or reduce the impacts from overflights of national parks, including the Grand Canyon. The IWG (comprised of NPS and FAA) implemented recommendations from the NPS Overflight report of 1994 resulting in Special Federal Aviation Regulations (SFARs) being established the Grand Canyon and two parks in Hawaii.

The National Parks Air Tour Management Act (NPATMA) of 2000 provides for the regulation of commercial air tours throughout the National Park System. FAA and NPS are required to jointly develop an Air Tour Management Plan (ATMP) for every National Park where air tours exist or are proposed. In 2001, the National Parks Overflights Advisory Group (NPOAG) was established with representatives from general aviation, air tour operators, environmental groups, and Native American tribes to provide "advice, information, and recommendations to the FAA Administrator and NPS Director." To coordinate these efforts, the NPS Natural Sounds Program Office opened the Natural Sounds and Night Skies Division in October of 2000 at Ft. Collins, Colorado.

DoD Policy Board on Federal Aviation (PBFA)

The PBFA is a Pentagon based committee that represents DoD aviation interests as a partner with the FAA addressing domestic and international civil aviation issues. Each branch of the military has a centralized office that sets policy and oversees airspace matters for their respective branch. Airspace issues affecting multiple branches of the military are resolved by a DoD headquarters committee, and the DoD PBFA. The PBFA has a representative at the U.S. Air Force ARCs meetings to provide a conduit to the Pentagon to address issues that cannot be resolved locally.

State Aviation Committees and Interest Groups

Colorado, Alaska, Idaho, and California all have active Airspace Advisory Groups which are associated with either the State Aviation Board or the Governor's office and that coordinate airspace issues.

Aircraft Owners and Pilots Association (AOPA)

AOPA represents the interests of more than 415,000 general aviation members nationwide to promote, protect, and defend GA through work at the local, state, and federal levels. AOPA is a watchdog for airspace issues that threaten the "public right to freedom of transit" as outlined in the 1958 National Airspace Act.

National Business Aircraft Association (NBAA)

NBAA is the voice of business aviation and maintains strong relationships with government and industry. NBAA analyzes proposed governmental legislative and rule changes, alerts Congress and its members of any airspace proposals that may affect the use of the national airspace by NBAA members.

Helicopter Association International (HAI)

Since its inception nearly 60 years ago, the HAI has become the world's largest association representing the international helicopter industry. Its mission is to promote the civil use of helicopters and to promote safety. Over 17,000 professionals attend HAI's annual Heli-Expo which is the world's largest helicopter industry convention and tradeshow. Several committee meetings and panel discussions are held at the event to encourage interaction and communication between federal and state regulators and helicopter professionals on a variety of topics including land management issues and airspace coordination. For more information visit: https://rotormedia.com/.

Chapter 3 – Airspace Basics

The National Airspace System

The NAS consists of all airspace over the United States above the ground up to 60,000' MSL. Despite the apparent vastness of this resource, it has become crowded (in some places) and competition for its use is increasing. By law, the FAA is the controlling authority for all airspace in the United States and, in order to provide for the orderly and safe use of the airspace, has published numerous regulations which are found in Chapter 14, CFR.

This chapter presents basic airspace information as it might pertain to land management agencies. Consult the FAA website for current regulations and procedures regarding flight planning or navigating.

Understanding VFR/IFR Flight Terms

The terms IFR and VFR are used throughout this document. General aviation aircraft flying between local airports, flight training, sightseeing, etc., comprise the majority of VFR flying. VFR weather conditions allow pilots to fly using visual reference to surface features such as highways, rivers, towns, etc. In order to fly VFR, the horizontal visibility and cloud ceiling (above the surface) must meet or exceed certain minimum requirements that are specified in 14 CFR Part 91.155. These conditions vary in the different classes of airspace. As a general rule, where there is controlled airspace designated to the surface, taking off and landing under VFR requires at least three miles of horizontal visibility and a cloud ceiling of at least 1,000' above ground level (AGL). In all cases, a pilot flying under VFR must remain far away from clouds, during daytime hours and at night. Navigation in VFR conditions using ground references is normally augmented by, but not solely dependent on electronic navigation aids such as a VHF Omnidirectional Range (VOR) or GPS. VFR flight does not usually require a clearance from ATC except in busy airspace, such as Class B and C. VFR pilots exercise “see and avoid” tactics, altering course heading or altitude as necessary to avoid conflicts with other aircraft.

IFR flights that penetrate or transition through clouds require the use of instruments as the sole reference for aircraft control and navigation. IFR pilots are trained and certified in specific navigational methods and procedures and are required to adhere to specific ATC clearances with assigned flight routes and altitude directions. Strict adherence to the ATC communication requirements, and compliance with ATC instructions and published procedures enables the FAA to separate IFR traffic via radar. In many cases, IFR procedures enable a pilot to fly all the way down to the landing environment, even when poor visibility and low cloud ceilings exist at low altitudes. All flight operations conducted above 18,000', even on clear days, must operate under an IFR flight plan with an ATC clearance, communications, and with radar separation services provided by ATC.

Airspace Categories

The national airspace is divided into two broad categories controlled, and uncontrolled airspace. Within the controlled airspace category, there are a variety of classifications which determine flight rules, pilot qualifications, and aircraft capabilities required to operate in the airspace. The specific classification of any area is determined by the FAA and depicted on aeronautical sectional charts. The class of any airspace is largely based on the complexity or density of air traffic, the nature of operations conducted within the airspace, the level of safety required, as well as national and public interest.

It is important that pilots, dispatchers, and managers be familiar with the operational requirements of the various types of airspace in order to assess the impact on agency aircraft operating over agency lands. It is also incumbent on both the pilot and the dispatcher to be familiar with the appropriate points of contact within the FAA and DoD regarding Controlled Airspace, SUA, and MTRs. Unfortunately, there is no "one call solves all" point of contact in airspace coordination. Each type of FAA airspace, including SUA, has its own designated entity that is responsible for controlling, scheduling and/or coordinating the use of their designated portion of the national airspace.

Overview of Airspace Designations of the United States

To describe how airspace is structured and managed, the explanation is grouped into major categories with sub-categories as follows.

- Controlled Airspace
- Class A Airspace
- Class B Airspace
- Class C Airspace
- Class D Airspace
- Class E Airspace
- Class F Airspace (an international designation that is not found in United States)
- Uncontrolled Airspace
- Class G Airspace
- En route Routing System
- Victor Airways (Low Altitude VFR or IFR routes between VORs)
- Transition Routes (aRea NAVigation (RNAV)–GPS–Low Altitude IFR)
- VFR Flyways and transition routes (found in or beneath Class B airspace)
- Jet Routes (VOR–High Altitude IFR)
- Q Routes (RNAV–GPS–High Altitude IFR)
- Special Use Airspace (SUA)
- Prohibited Area (PA)
- Restricted Area (RA)
- Military Operations Area (MOA)
- Alert Area (AA)
- Warning Area (WA)
- Controlled Fire Area (CFA)
- Military Training Route (MTR), Military Training Routes (IR) and Military Training Routes (VR)
- Slow Routes
- Other Kinds of Airspace

- Maneuver Areas/LOWAT (Low Altitude Tactical)
- Low Altitude Tactical Navigation Areas (LATN)
- Local Flying Areas
- Air Refueling Routes
- Temporary Special Use Airspace (TSUA)
- Cruise Missile Routes
- National Security Areas (NSA)
- Air Traffic Control Assigned Airspace (ATCAAs)

Airspace Classifications

There are seven primary classes of airspace designated in the NAS that are lettered A through G (see Figure 3-1). In addition, there are a variety of terms utilized to identify operational structures, hazards, and unique areas within the airspace. Controlled and uncontrolled are broad terms that refer to the level of ATC services that is either available or required to operate within the airspace. Most controlled airspace has specific, predetermined dimensions whereas uncontrolled airspace can be of almost any size. Class G is the only class of uncontrolled airspace. Except as noted in the following descriptions, the FAA normally is the controlling agency for all classes of airspace.

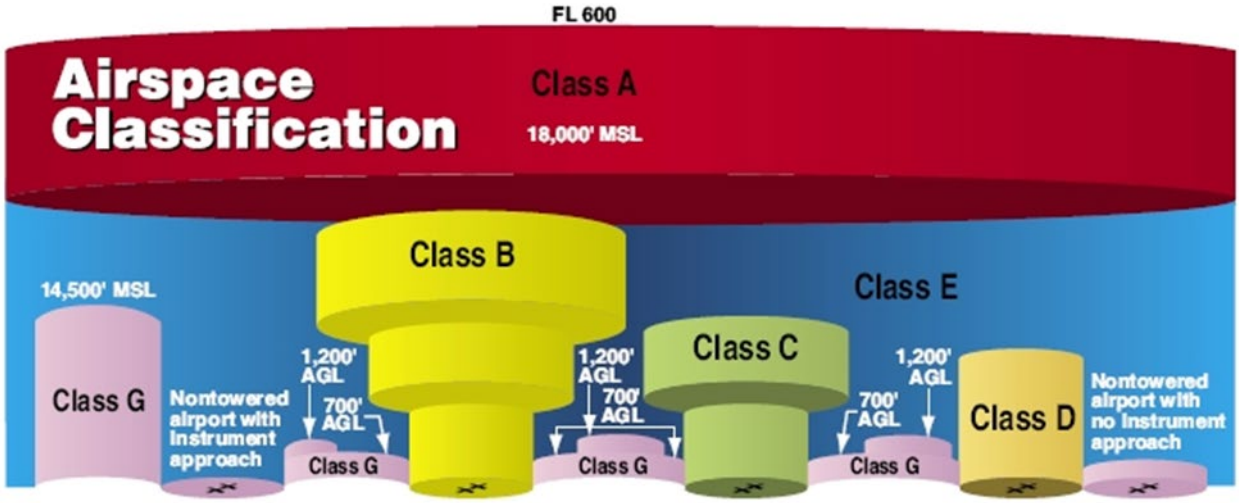


Figure 3-1: National Airspace Classification

Class A Airspace

Generally, Class A Airspace includes the airspace from 18,000' MSL up to 60,000' MSL (Referred to as "Flight Level 600" [FL600] by the FAA) including the airspace overlying the waters within 12 nautical miles (NM) of the coast of the 48 contiguous states and Alaska. All operations within Class A airspace must be under IFR and is flown under the direct control of ATC. Class A airspace is not specifically charted or designated on sectional maps commonly used for airspace coordination.

Class B Airspace

This airspace surrounds the nation's busiest commercial airports. This is the most congested airspace and has the most complex mix of aircraft operations with everything from single engine trainers to high-speed jet transports. At its core, it normally extends from the surface to 10,000' MSL.

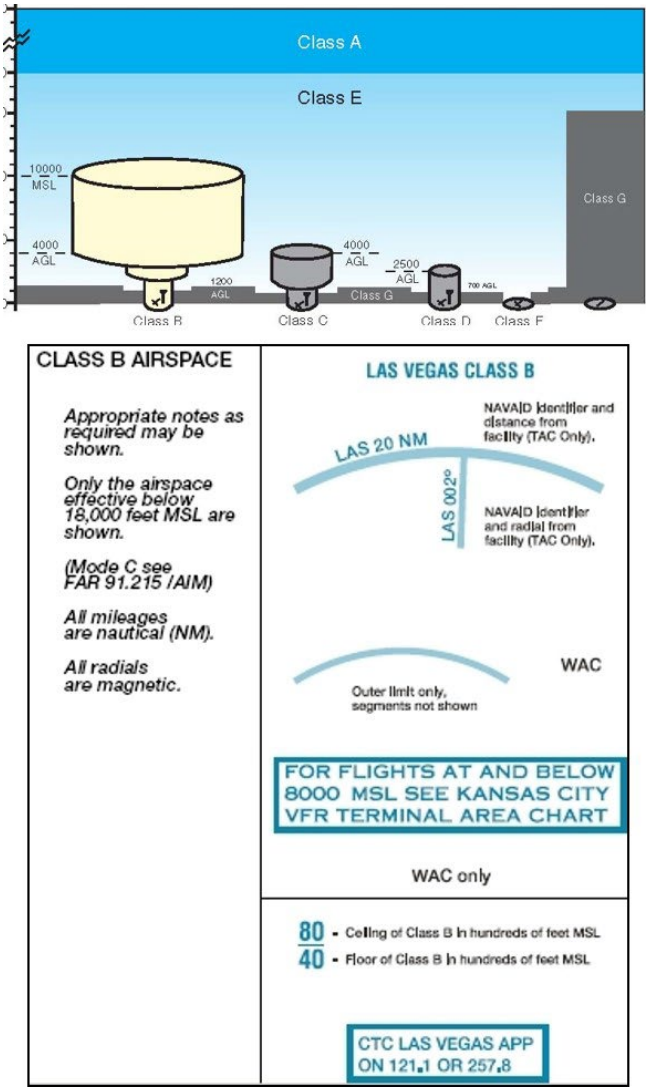


Figure 3-2: Class B Airspace

The overall shape of Class B can be likened to an upside-down wedding cake of several layers. Each layer is divided into sectors with the exact dimensions and shape individually tailored to meet local traffic and safety needs. The outer limit of Class B may extend up to 30 NM from the primary airport. ATC clearance is required to operate in Class B airspace areas. To increase safety, the airspace is designed to minimize the number of turns that large aircraft are required to perform as they descend to an airport, while still enabling other aircraft to safely transition the area. Class B airspace is charted on sectional aeronautical charts. Separate terminal area charts (TAC) are published for individual areas of Class B airspace to provide greater detail and clarity.

TFRs needed in the vicinity of Class B airspace must be carefully coordinated with the FAA due to the significant impact that a TFR will have on the airport. A TFR will generally not be issued in Class B airspace because all traffic is already separated by ATC radar and strict communications requirements.

Mode C Veil: Often when coordinating a TFR in the vicinity of Class B airspace, dispatchers will hear the FAA refer to the term “Mode C Veil.” This is the area within 30 NM of a Class B airport, depicted as a thin magenta circle surrounding Class B airspace on sectional and TAC charts. Within this circle, a mode C transponder with altitude reporting capability is generally required from the surface to 10,000' MSL.

Figure 3-3: Class B Airspace – Sectional Chart Depiction

Class C Airspace

This airspace surrounds the busy airports of mid-sized cities with a large number of commercial flight operations as well as some military airports. An operating control tower at the primary airport and radar services are key components of Class C airspace.

Generally, the overall shape is also that of an upside-down wedding cake, but with only two layers. The inner ring has a radius of 5 NM normally from the surface up to 4,000' above the airport elevation. The outer ring (or shelf) generally has a radius of 10 NM and extends from 1,200' AGL to 4,000' above airport elevation. ATC provides traffic separation services on a workload available basis to VFR pilots operating just outside of Class C, within a 20 NM radius of the center of that airspace.

A transponder with automatic altitude reporting equipment is required (unless otherwise authorized by ATC) when operating in Class C. Radio communications must be established with ATC prior to entering Class C airspace and maintained thereafter when operating in that airspace.

Dispatchers and ASCO should coordinate closely with ATC when considering a TFR within Class C airspace. It may not be necessary due to the separation services already provided.

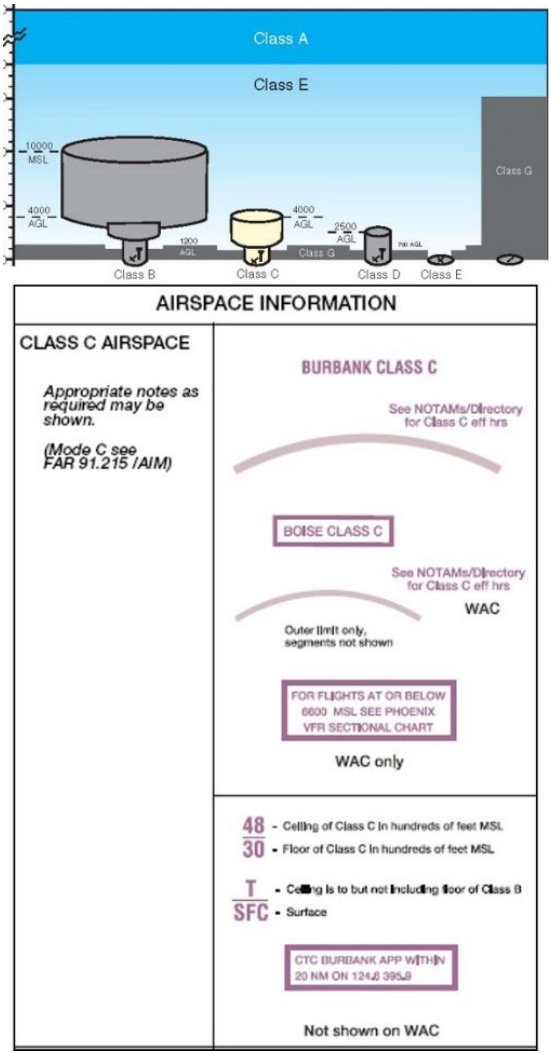


Figure 3-4: Class C Airspace

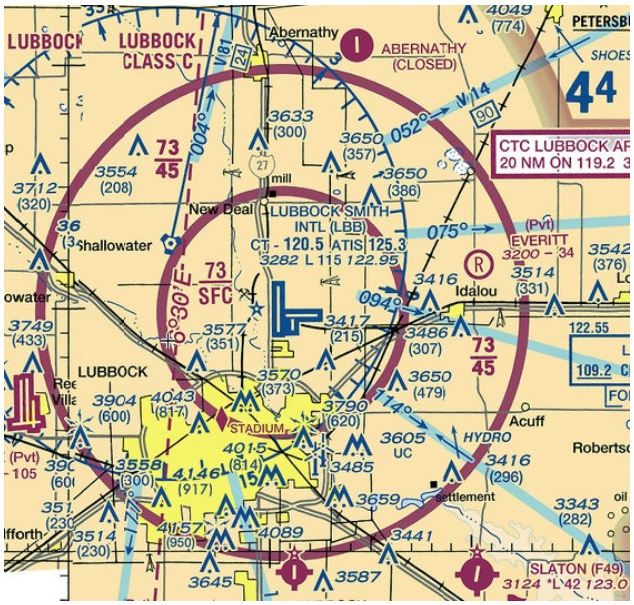


Figure 3-5: Class C Airspace – Sectional Chart Depiction

Class D Airspace

This airspace is applied to airports with operating control towers but where the traffic volume does not meet Class C or Class B standards. Traffic usually lacks the heavy jet transport activity but often includes a complex mix of general aviation, turbo prop, and business jet traffic. Radar service may or may not be available.

Generally, the towered airport for which Class D airspace is established is the center point for a three to five NM radius circle (depicted as a blue dashed line on the sectional chart as shown in Figure 3-7). The ceiling altitude of Class D typically extends up to an altitude of 2,500' AGL, rounded up to the nearest whole hundreds of feet. Class D airspace may vary in height and width depending on local terrain or the proximity of adjacent Class B or C airspace. There are frequently one or more "keyhole" extensions protruding from the circular airspace with either Class D or E designated to the surface to accommodate IFR traffic using published Instrument Approach Procedures. Where radar service is available, ATC will provide separation services to IFR traffic and participating VFR traffic. All traffic operating in Class D airspace must establish radio communication with ATC prior to entry and thereafter maintain communications with the tower while operating within Class D. (There are a few rare exceptions to this communications requirement that are designated for aircraft with inoperable radios or other extenuating situations.)

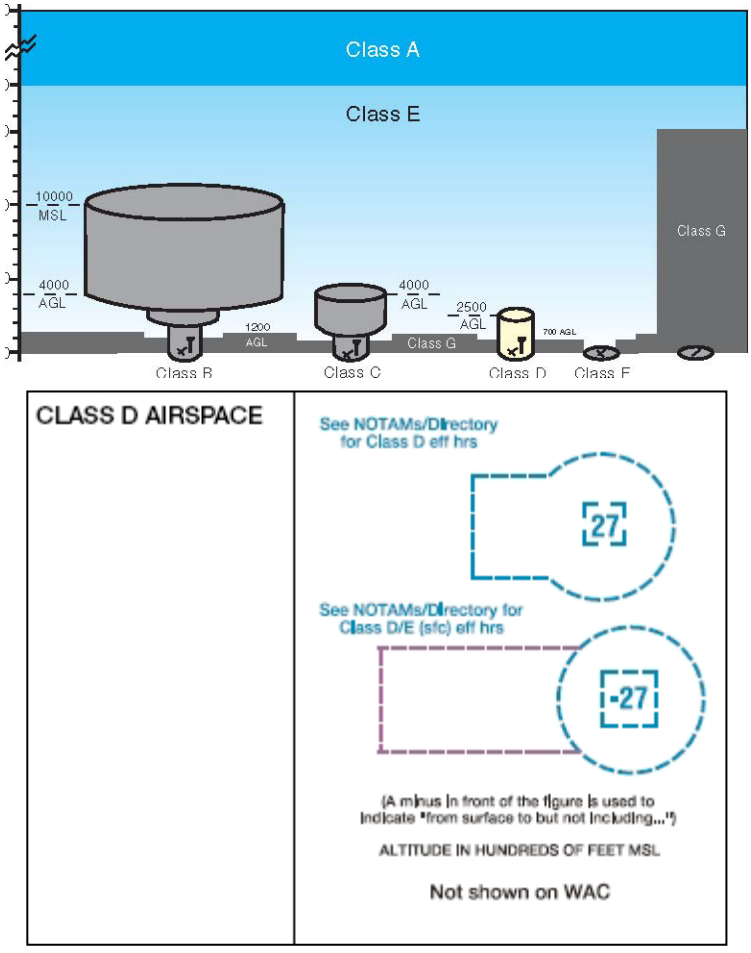


Figure 3-6: Class D Airspace

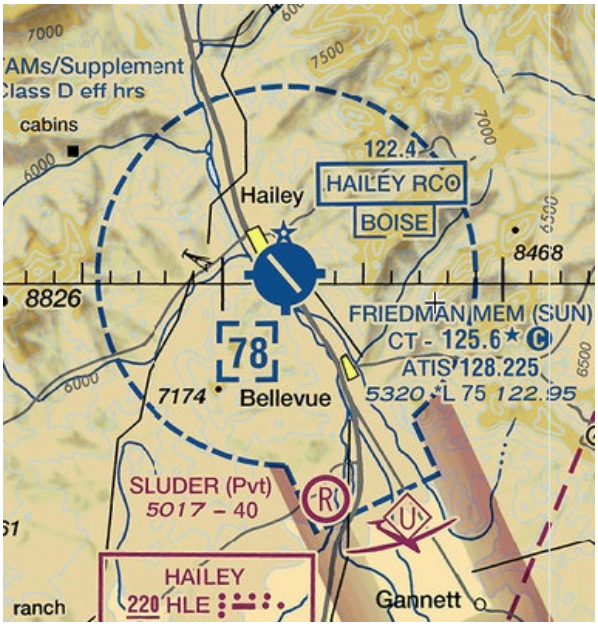


Figure 3-6: Class D Airspace – Sectional Chart Depiction
Class D is depicted by a dashed blue line surrounding a blue, towered airport symbol.

Class E Airspace Areas

Class E airspace exists primarily to assist IFR traffic, although VFR traffic freely and routinely operates in Class E at all altitudes. It is depicted on sectional charts in several ways, depending on its designated floor altitude. Class E may extend upwards from the surface, from 700' AGL, 1,200' AGL, or 14,500 MSL (See examples in Figures 3-9, 3-10, and 3.11). Unless there is an overlying shelf of Class B or C airspace, Class E extends upward to the base of the overlying Class A airspace at 18,000'.

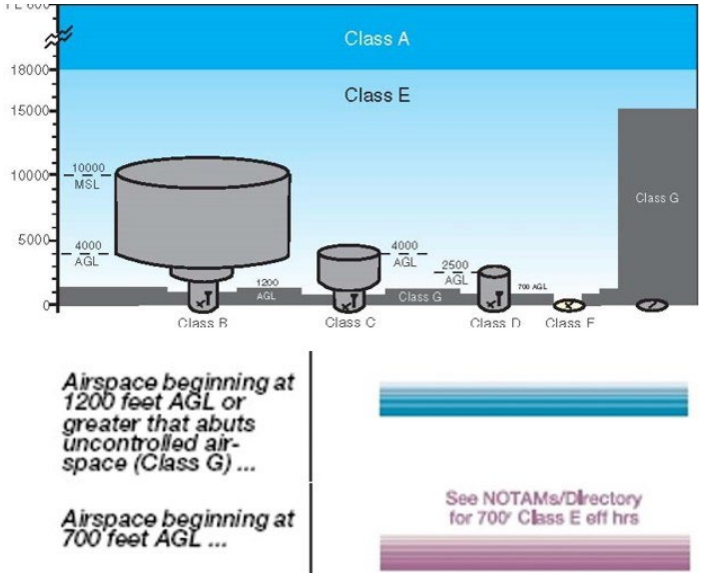


Figure 3-7: Class E Airspace

Figure 3-8: Class E Airspace Designated to the Surface by a Dashed Magenta Line

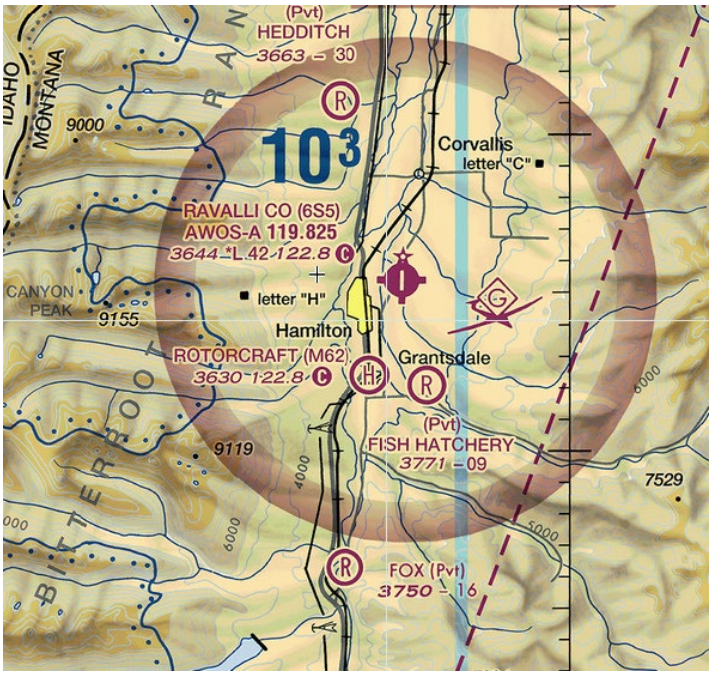


Figure 3-9: Class E Airspace Depicted on Sectional Chart
Starting at 700' AGL around Hamilton, MT, with Class G uncontrolled airspace to the surface below.

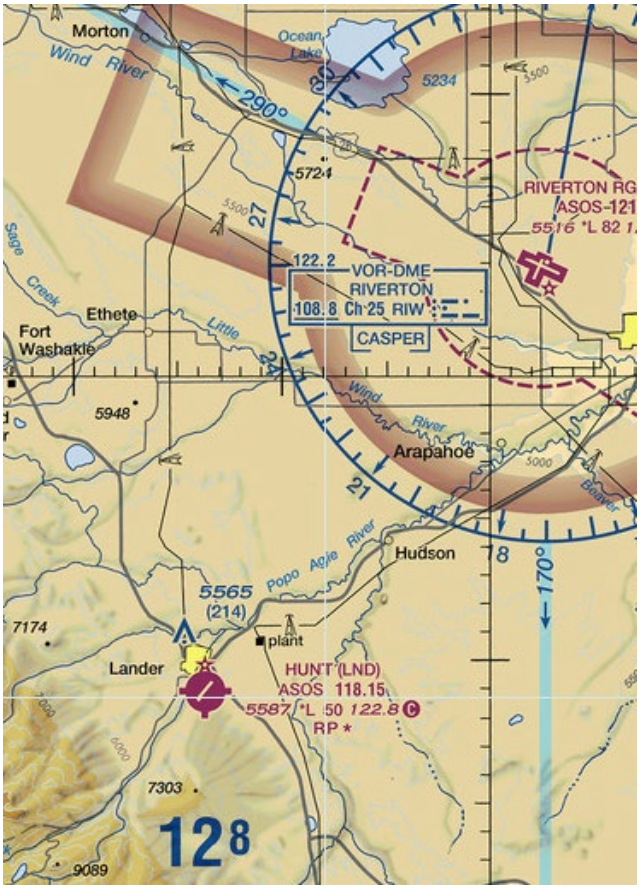


Figure 3-10: Class E Airspace in vicinity of Lander, WY
Starting at 1,200' AGL with Class G Uncontrolled airspace to the surface below.

Class F Airspace Areas

This is an international classification which is not utilized in the United States. Canada utilizes Class F airspace for prohibited, restricted, military, and temporarily restricted airspace.

Class G Airspace Areas

Class G is uncontrolled airspace and includes all airspace not otherwise designated as A, B, C, D, or E. With improved radar and satellite technology available for use by ATC, Class G is rarely found anywhere in the United States above 1,200' AGL. Operations within Class G airspace are governed by the principle of “see and avoid.” The minimum required visibility and cloud clearance requirements in Class G, when operating lower than 1,200' in daytime, are significantly lower than those required in other classes of airspace. Agency flight operations in uncontrolled airspace should be approached with caution. Aircrew members or passengers should be reminded to assist the pilot with “see and avoid.”

En Route Structures

En route structures consist of several routing corridors, essentially highways in the sky, utilized by both IFR, and VFR traffic. Relatively large amounts of traffic are concentrated along these routes. Three fixed route systems are established for air navigation purposes. They are the federal airway system (consisting of Very High Frequency Omnidirectional Range [VOR] and L/MF routes), the jet route system, and the RNAV route system. To the extent possible, these route systems are aligned in an overlying manner to facilitate transition between each.

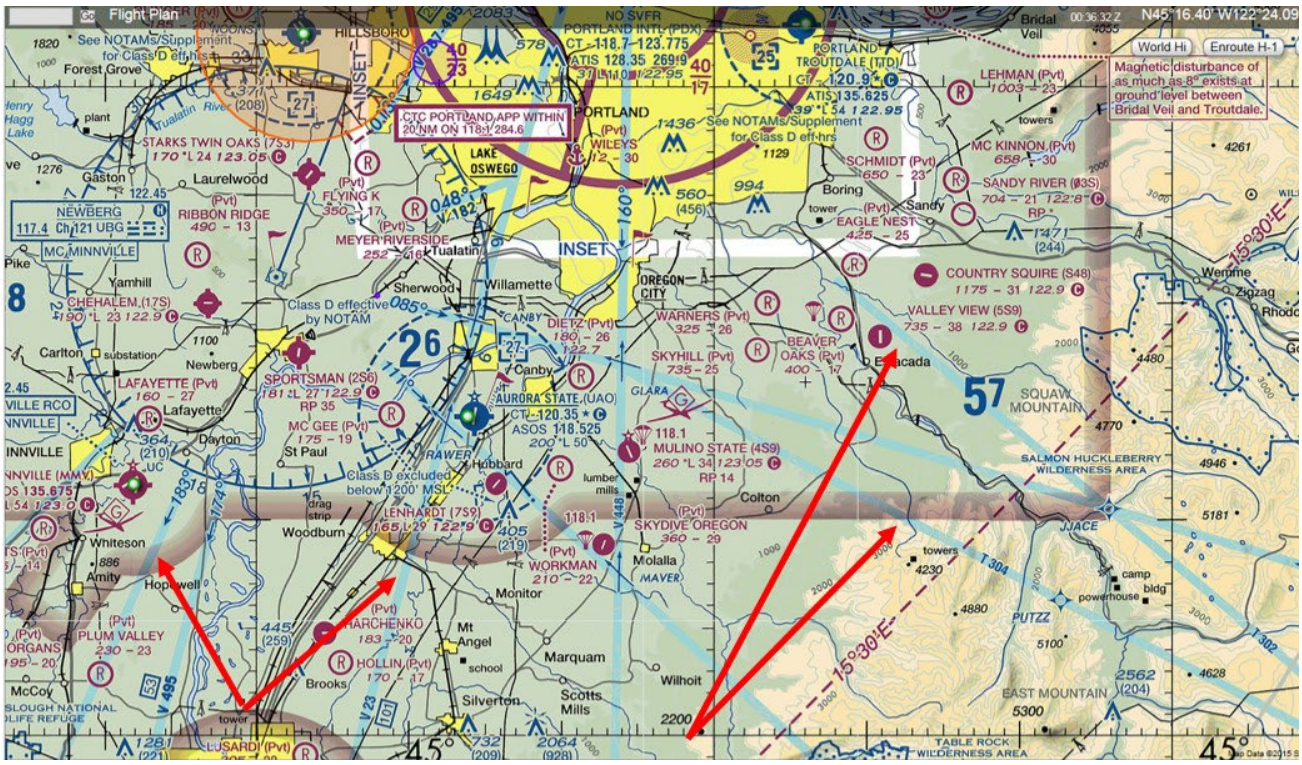


Figure 3-11: En Route Victor Airways and RNAV (GPS) T-Routes

Victor Airways are direct routes between VORs. T-Routes are defined by RNAV (GPS) waypoints.

Low Altitude Airways

Victor airways are defined by radials from a Very High Frequency Omnidirectional Range (VOR) and are the primary "highways" utilized by both IFR and VFR traffic. They are 8 NM wide and generally range from 1,200' AGL up to but not including 18,000 MSL. The floor altitude may vary to ensure that aircraft operating on the airway remain clear of ground obstructions and have the ability to receive the radio signals from navigational facilities.

Jet Routes

Jet routes serve the same function as the above low altitude airways except that they are found between 18,000 MSL and to 45,000 MSL. Traffic on a jet route is always IFR designated and is managed by ATC. Jet routes are shown on the High Altitude Charts as a gray line and are represented by the letter "J" followed by a number.

Area Navigation (RNAV) Routes

Published RNAV routes, including Q−Routes (high altitude) and T−Routes (low altitude) can be used by aircraft with RNAV capability, subject to certain limitations or requirements noted on IFR en route charts, or in applicable Advisory Circulars, or by NOTAM. RNAV routes are depicted in blue on aeronautical sectional charts and are identified by the letter "Q" or "T" followed by the airway number (for example, Q−13, T−205).

VFR Flyway

These are general routes for VFR traffic wishing to transition below an overlying shelf of Class B airspace. An ATC clearance is not required to utilize a VFR flyway which are normally depicted as wide blue arrows on the back of terminal area charts. The best way to determine if a local flyway exists that is not charted is to ask the ATC facility controlling the Class B airspace.

VFR Transition Routes

These are used to accommodate VFR traffic transitioning through certain segments of Class B airspace. Unlike flyways, a clearance is required from ATC to use VFR transition routes, and radar separation service is always provided. VFR transition routes are identified by a notation and magenta colored arrows on terminal area charts.

Air Traffic Control Assigned Airspace (ATCAA)

ATCAAs were established to permit the continuation of MOA activities above 18,000' MSL. From the standpoint of the MOA "user," MOA and ATCAA are combined into one piece of airspace, with 18,000' MSL acting as an administrative boundary. Usually, the ATCAA is activated concurrently with the MOA. VFR aircraft are permitted to enter a MOA but are not permitted to enter most ATCAAs because they exist above 18,000' MSL in Class A airspace which normally requires being on an IFR flight plan. MOAs are depicted on sectional aeronautical charts, but ATCAAs are not depicted.

VFR Waypoints Chart Program

The VFR Waypoint Chart program was established to provide VFR pilots with a supplemental tool to assist with position awareness. The program is designed to enhance safety, reduce pilot deviations, and provide navigation aids for pilots unfamiliar with an area in or around Class B, Class C, and SUA. The name of a VFR Waypoint (for computer entry and flight plans) consists of five letters beginning with "VP." VFR Waypoints will be portrayed on sectional aeronautical charts as a four-point star symbol. VFR Waypoints co-located with Visual Check Points on the sectional aeronautical charts will be identified by small magenta flag symbols. Each VFR Waypoint name will appear in parentheses adjacent to the geographic location on the chart.

Maximum Elevation Figure (MEF)

Within each grid on a sectional aeronautical chart is a large blue number followed by a smaller number. The example "7$_{7}$" is shown in Figure 3-13 below to denote the highest terrain elevation (or vertical obstruction) within that grid square as being 7,700' MSL.

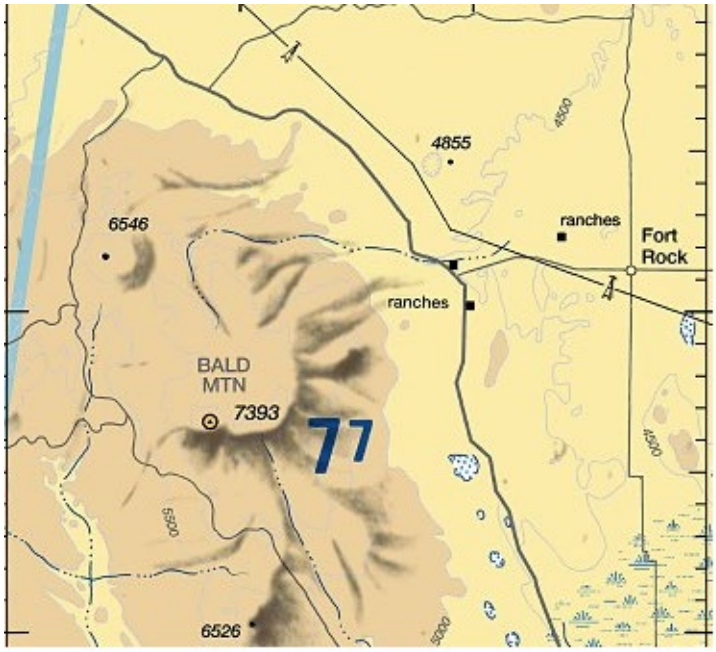


Figure 3-12: Example of an MEF

Special Use Airspace (SUA)

This FAA airspace designation is designed to alert users about areas of military activity, unusual flight hazards, or national security needs, and to segregate that activity from other airspace users to enhance safety. While most SUAs involve military activity, some may involve civilian users such as the Department of Energy. Detailed information about current SUA is found in the DoD AP/1A flight planning information publication and on the reverse side of a Sectional Aeronautical Chart Legend.

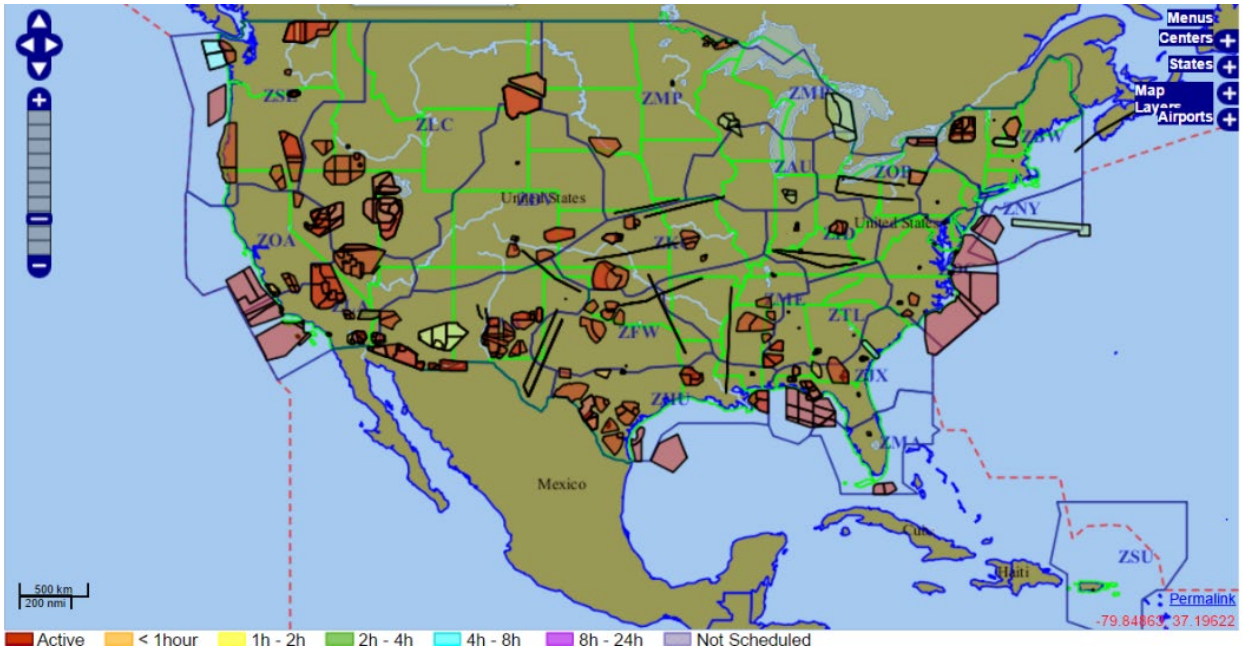


Figure 3-13: FAA SUA Map,
https://sua.faa.gov/sua/siteFrame.app

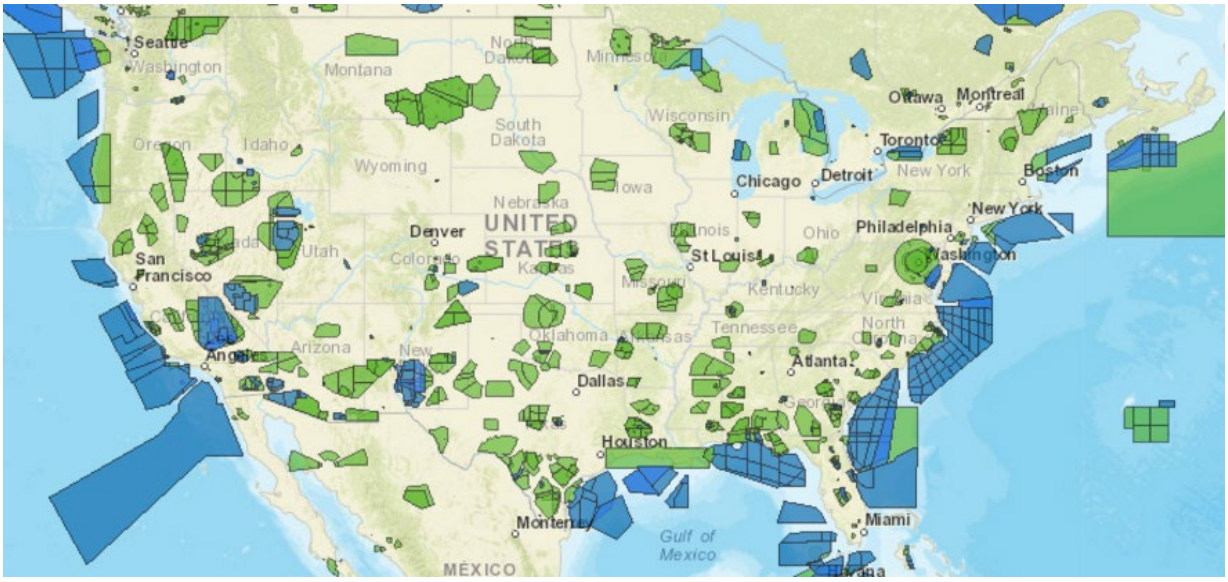


Figure 3-14: EGP Map of SUAs

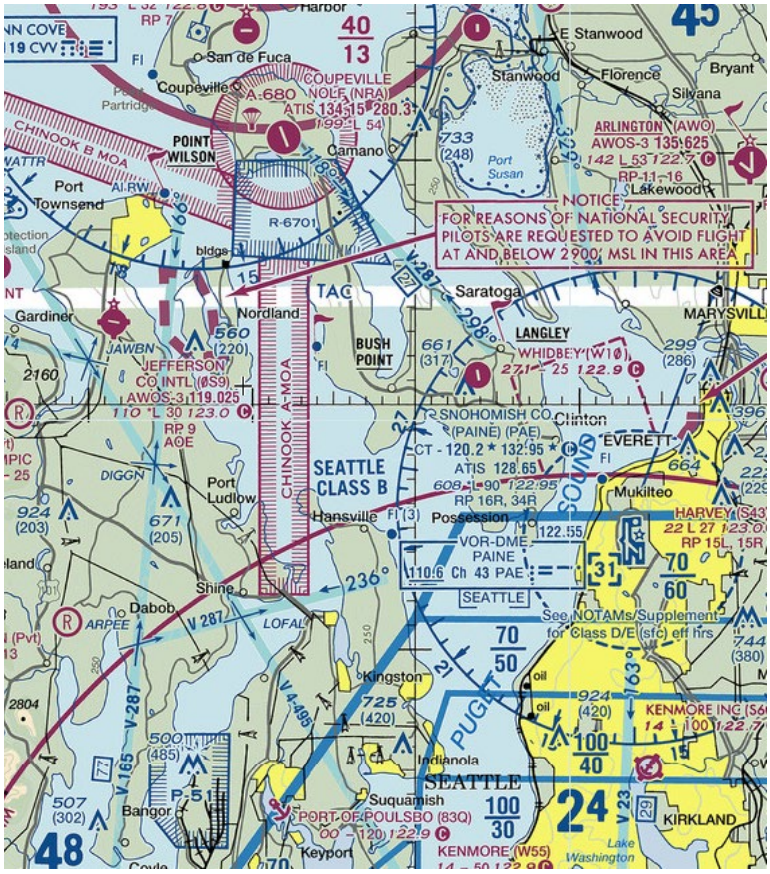


Figure 3-15: Seattle Sectional Chart.

Depiction of multiple types of SUA located northwest of Seattle, WA, including an AA, two military operations areas, an RA, a PA, and a national security area.

Prohibited Areas (PAs)

PAs are established over sensitive ground facilities such as the White House, Camp David, Presidential homes, etc. (see Figure 3-17). The dimensions of the PA vary. All aircraft are prohibited from flight operations within a PA unless specific prior approval is obtained from the FAA or the controlling agency. PAs are charted on sectional aeronautical charts, IFR en route charts, and TAC. They are identified by the letter "P" followed by a number.

Many agency personnel are familiar with the Boundary Waters Canoe Area in Minnesota which is a PA established by Executive Order. President Truman issued Executive Order 10092 on December 17, 1949, establishing an airspace reservation of certain areas of the Superior National Forest. With few exceptions, the order prohibits flight below 4,000 MSL over designated areas.

Agency personnel cannot plan any operations in a PA unless special authorization has been granted by the FAA or controlling agency.

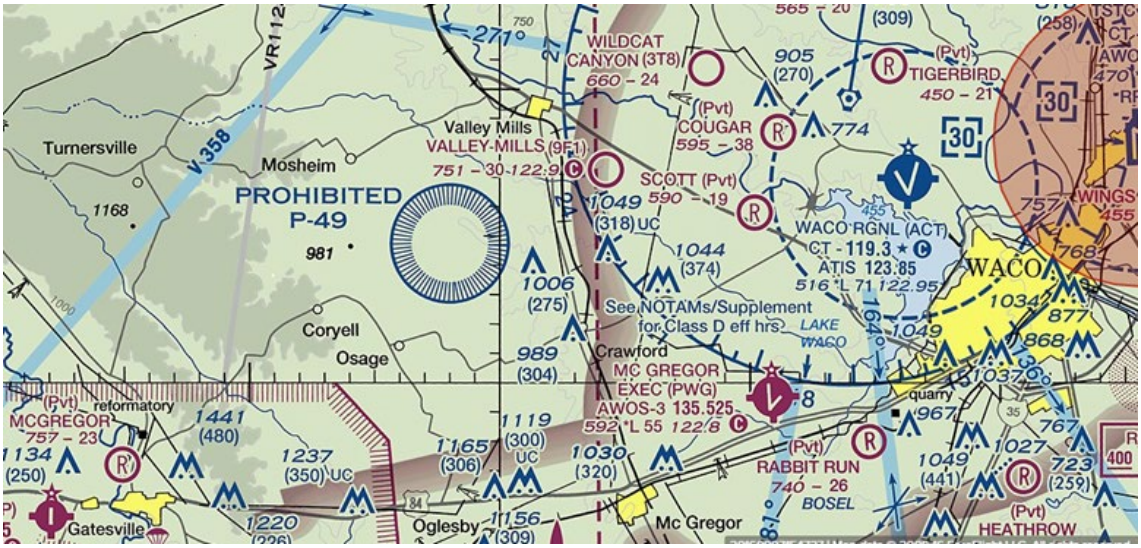


Figure 3-16: Example of a PA Depicted on the Sectional Chart West of Waco, TX

Restricted Areas (RAs)

RAs are established where ongoing or intermittent activities occur that create unusual and often invisible hazards to aircraft such as artillery firing, aerial gunnery, practice bomb dropping, and guided missile testing. Dimensions of the RA vary depending upon the needs of the activity and the risks to aircraft. RAs differ from PAs in that most RAs have specific hours of operation. Entry during these hours requires specific permission from the FAA or the controlling agency. In addition, there may be a separate Scheduling Agency who must also grant permission. Agency personnel must understand that hazardous flight activity is occurring in the RA when it is active. RAs are charted on sectional aeronautical charts. They are identified by the letter "R" followed by a number (see Figure 3-18). The floor and ceiling, operating hours, and controlling agency for each RA can be found in the chart legend. Figure 3-19 displays an example of a SUA table on a sectional aeronautical chart. In the legend, each RA is described with its identification number, location, altitude, time of use, and the controlling agency.

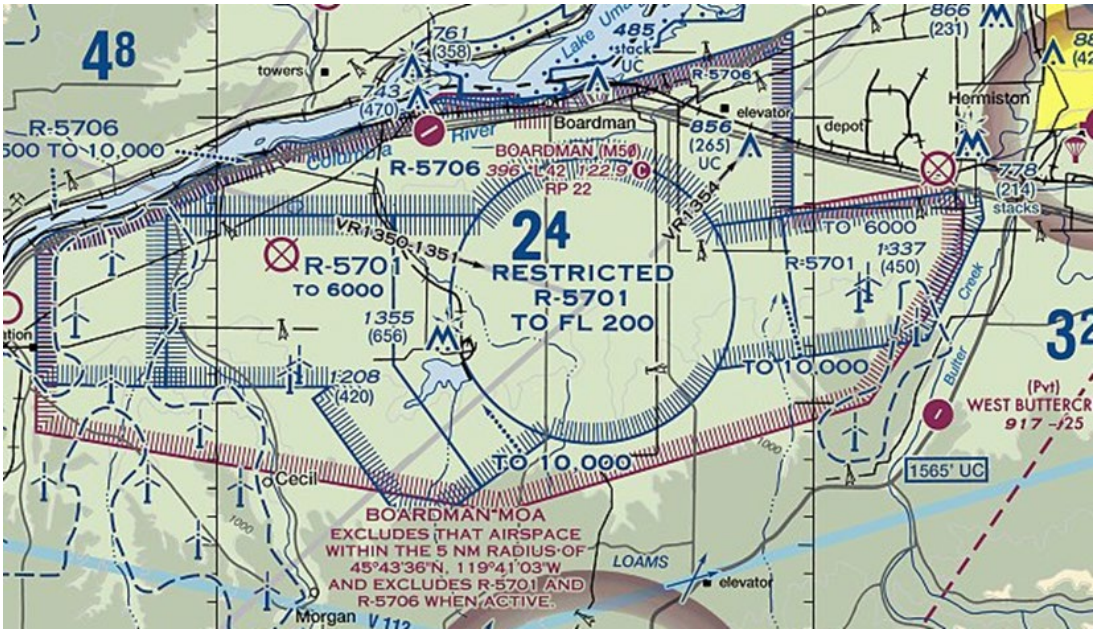
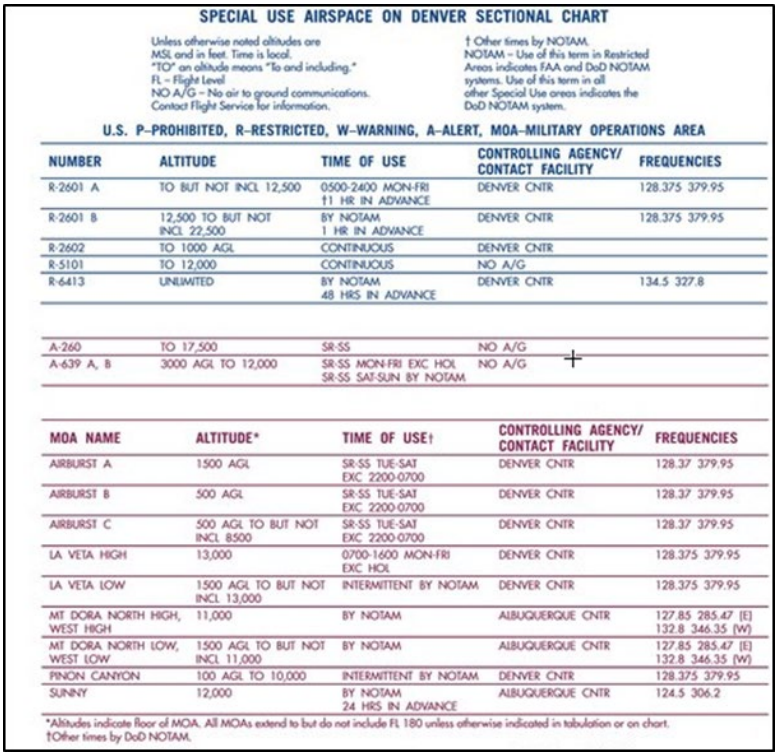


Figure 3-17: Sectional Chart Depiction of RAs

It is critical that each office that has airspace deconfliction and coordination responsibilities has current copies of all aeronautical sectional charts for their area.



SPECIAL USE AIRSPACE ON DENVER SECTIONAL CHART

Unless otherwise noted altitudes are MSL and in feet. Time is local. "TO" an altitude means "To and including." FL – Flight Level NO A/G – No air to ground communications. Contact Flight Service for information.

† Other times by NOTAM. NOTAM – Use of this term in Restricted Areas indicates FAA and DoD NOTAM systems. Use of this term in all other Special Use areas indicates the DoD NOTAM system.

U.S. P–PROHIBITED, R–RESTRICTED, W–WARNING, A–ALERT, MOA–MILITARY OPERATIONS AREA

NUMBER	ALTITUDE	TIME OF USE	CONTROLLING AGENCY/ CONTACT FACILITY	FREQUENCIES
R-2601 A	TO BUT NOT INCL 12,500	0500-2400 MON-FRI †1 HR IN ADVANCE	DENVER CNTR	128.375 379.95
R-2601 B	12,500 TO BUT NOT INCL 22,500	BY NOTAM 1 HR IN ADVANCE	DENVER CNTR	128.375 379.95
R-2602	TO 1000 AGL	CONTINUOUS	DENVER CNTR	
R-5101	TO 12,000	CONTINUOUS	NO A/G	
R-6413	UNLIMITED	BY NOTAM 48 HRS IN ADVANCE	DENVER CNTR	134.5 327.8
A-260	TO 17,500	SR-SS	NO A/G	
A-639 A, B	3000 AGL TO 12,000	SR-SS MON-FRI EXC HOL SR-SS SAT-SUN BY NOTAM	NO A/G	

MOA NAME	ALTITUDE*	TIME OF USE†	CONTROLLING AGENCY/ CONTACT FACILITY	FREQUENCIES
AIRBURST A	1500 AGL	SR-SS TUE-SAT EXC 2200-0700	DENVER CNTR	128.37 379.95
AIRBURST B	500 AGL	SR-SS TUE-SAT EXC 2200-0700	DENVER CNTR	128.37 379.95
AIRBURST C	500 AGL TO BUT NOT INCL 8500	SR-SS TUE-SAT EXC 2200-0700	DENVER CNTR	128.37 379.95
LA VETA HIGH	13,000	0700-1600 MON-FRI EXC HOL	DENVER CNTR	128.375 379.95
LA VETA LOW	1500 AGL TO BUT NOT INCL 13,000	INTERMITTENT BY NOTAM	DENVER CNTR	128.375 379.95
MT DORA NORTH HIGH, WEST HIGH	11,000	BY NOTAM	ALBUQUERQUE CNTR	127.85 285.47 (E) 132.8 346.35 (W)
MT DORA NORTH LOW, WEST LOW	1500 AGL TO BUT NOT INCL 11,000	BY NOTAM	ALBUQUERQUE CNTR	127.85 285.47 (E) 132.8 346.35 (W)
PINON CANYON	100 AGL TO 10,000	INTERMITTENT BY NOTAM	DENVER CNTR	128.375 379.95
SUNNY	12,000	BY NOTAM 24 HRS IN ADVANCE	ALBUQUERQUE CNTR	124.5 306.2

*Altitudes indicate floor of MOA. All MOAs extend to but do not include FL 180 unless otherwise indicated in tabulation or on chart.
†Other times by DoD NOTAM.

Figure 3-19: Example SUA Table from Sectional Aeronautical Chart Legend

Military Operations Areas (MOAs)

A MOA is an area of airspace designated for military training activities. MOAs were established to contain certain military activities such as air combat maneuvers, intercepts, acrobatics, etc. Civilian VFR flights are allowed within a MOA even when the area is in use by the military. ATC will separate IFR traffic from military activity. A clearance is not required for VFR operations.

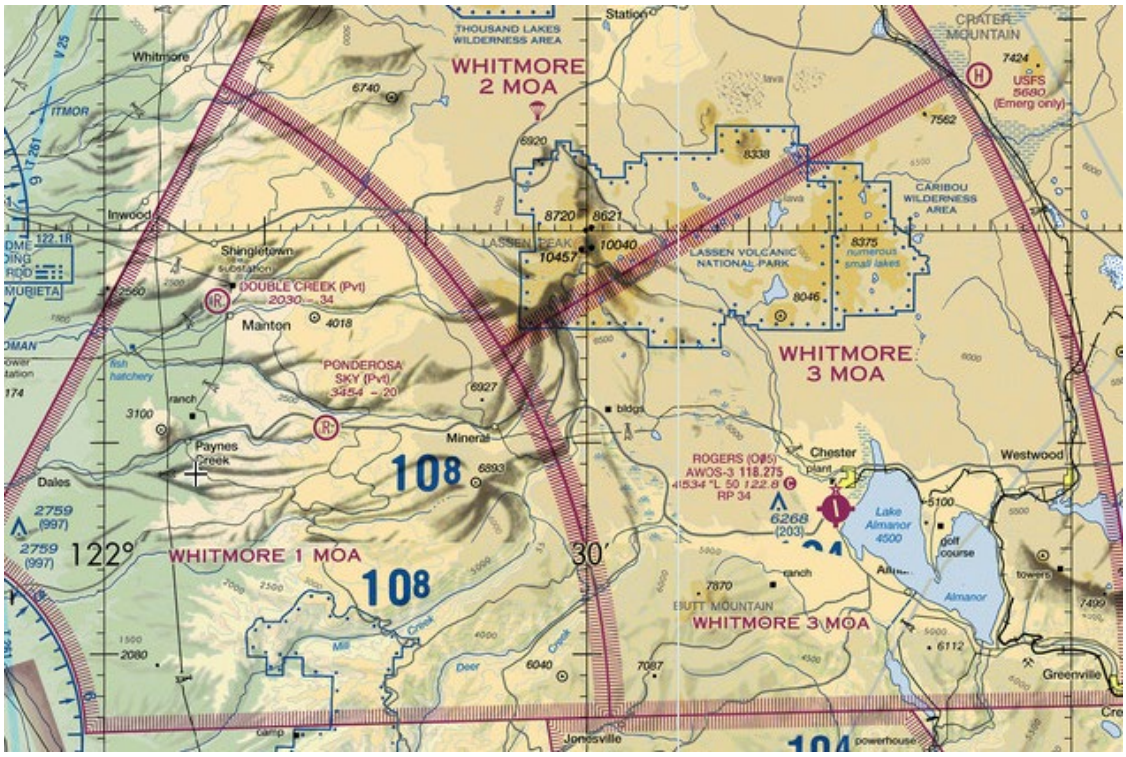


Figure 3-18: MOAs Depicted on a Sectional Aeronautical Chart

Users may encounter high-speed military aircraft involved in-flight training, acrobatic or abrupt flight maneuvers and formation flying often at speeds greater than 250 Knots Indicated Air Speed (KIAS). Military pilots conducting training within an active MOA are exempt from the provisions of the Federal Aviation Regulations prohibiting acrobatic flight within federal airways and control zones. They are also exempt with respect to the Federal Aviation Regulations for flights at speeds in excess of 250 knots below 10,000' MSL.

MOAs have a defined floor and ceiling which can range up to the floor of Class A airspace (18,000'). MOAs are identified by a specific name, the letters “MOA,” and are charted in magenta on sectional aeronautical charts (see Figure 3-20), IFR en route charts, and terminal area charts. MOA dimensions, hours of use, and controlling agency can be found in the sectional chart legend (see Figure 3-19). MOAs can be “stacked” on top of each other (see Figure 3-21). The status of a MOA can change rapidly and should be checked frequently when agency flight operations are occurring. Agency dispatch centers are responsible for deconflicting MOAs and other SUA by calling the appropriate scheduling or controlling authority to determine if there is activity in that airspace when dispatching agency aircraft into SUA.

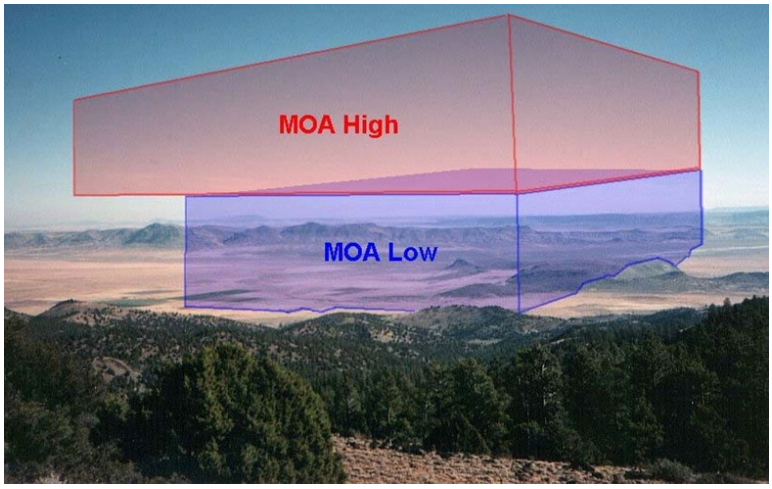


Figure 3-19: 'Stacked' Military Operations Areas

MOAs will have a Scheduling Agency responsible for scheduling all military flights intending to use the airspace. If the Scheduling Agency does not have a continuous point of contact, then an alternate Scheduling Agency will be designated. Consult the AP1/A for scheduling MOA information. It is strongly recommended that communications be established with the controlling agency of any MOA in proximity to agency flight operations, even if the MOA is not active. At a minimum, pilots should contact ATC prior to entering an MOA to get the most current status information.

Alert Areas (AAs)

AAs may contain a high volume of pilot training or an unusual type of aerial activity. There are no special requirements for operations within an AA, other than heightened vigilance. All operations must be in compliance with the Federal Aviation Regulations. The types of flying involved could be military, aircraft manufacturers or a high concentration of flights (i.e., helicopter activity near oil rigs). AAs are depicted by defined areas marked with the letter "A" followed by a number (see Figure 3-22). AA dimensions differ for each area as depicted on sectional charts, IFR en route charts, or TAC charts.

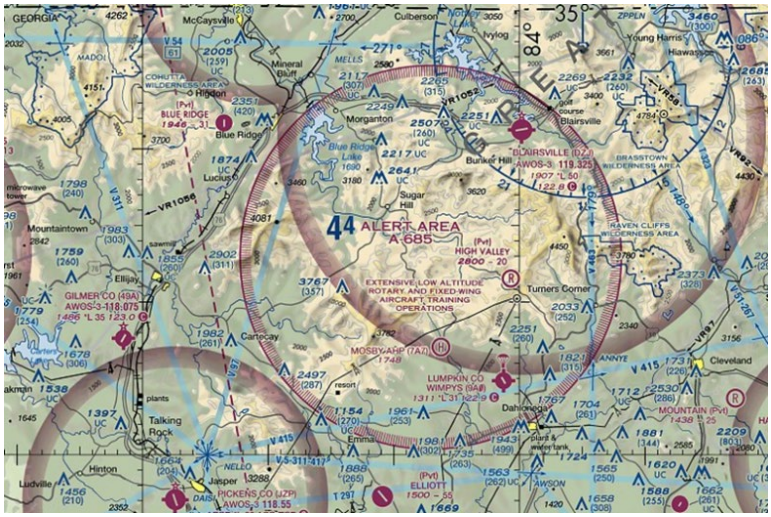


Figure 3-20: Alert Area (AA) Depicted on a Sectional Aeronautical Chart

Warning Areas (WAs)

Warning Areas contain the same kind of hazardous flight activity as RAs but have a different title since they are located offshore over domestic and international waters. Examples of likely hazards include artillery firing, aerial gunnery, guided missile exercises, and fighter interceptions. WAs generally begin three miles offshore. Executive Order 10854 extends the application of the Federal Aviation Act of 1958, as amended, to the overlying airspace of those areas of land or water outside the United States beyond the 12-mile offshore limit. It includes areas that the United States has appropriate jurisdiction or control under international treaty agreement. WAs overlying the territorial waters of the United States are under FAA jurisdiction. However, any airspace action, rulemaking or non-rulemaking that concerns airspace beyond the 12-mile offshore limit requires coordination with the Departments of Defense and the adjacent state. Although VFR operations are permitted in WAs, the FAA does not guarantee traffic separation and agency personnel should carefully weigh the risks of such operations. WAs are represented on sectional aeronautical charts, IFR en route charts and some terminal area (TAC) charts. They are depicted by a "W" and a number (see Figure 3-24). Dimensions for each WA can be determined by consulting the appropriate chart legend.

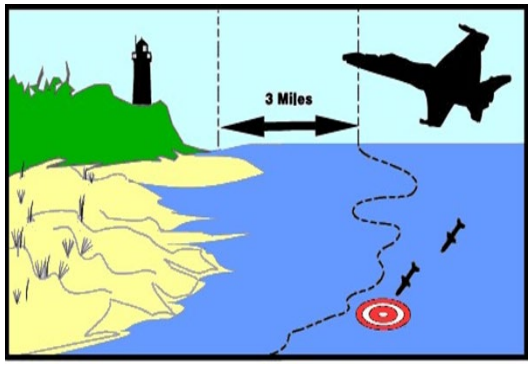


Figure 3-21: Warning Area

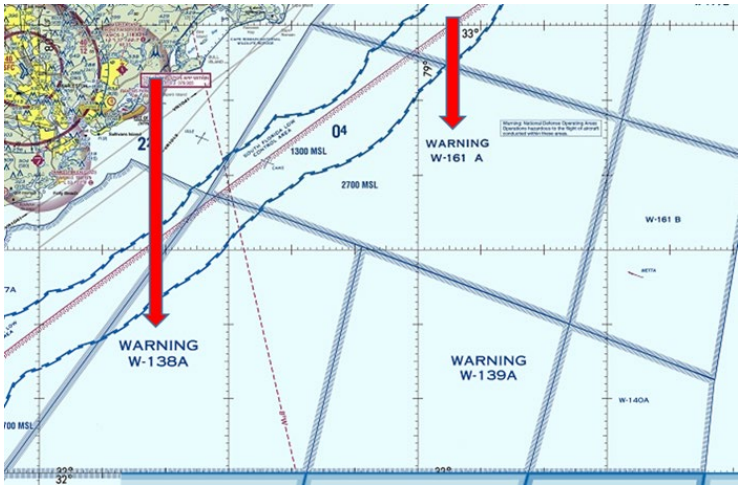


Figure 3-22: Warning Area Depicted on a Sectional Aeronautical Chart

Controlled Firing Areas (CFAs)

CFA contain civilian and military activities which, if not contained, could be hazardous to "nonparticipating" aircraft (see Figure 3-25). These include rocket testing, ordinance disposal, small arms fire, chemical disposal, blasting, etc. CFAs are differentiated from MOAs and RAs in that radar, or a ground lookout is utilized to indicate when an aircraft might be approaching the area. All activities are then suspended.

The FAA does not chart CFAs because a CFA does not require a nonparticipating aircraft to change its flight path. Agency personnel may find information about CFAs from the nearest regional FAA headquarters.

Figure 3-23: Controlled Firing Areas

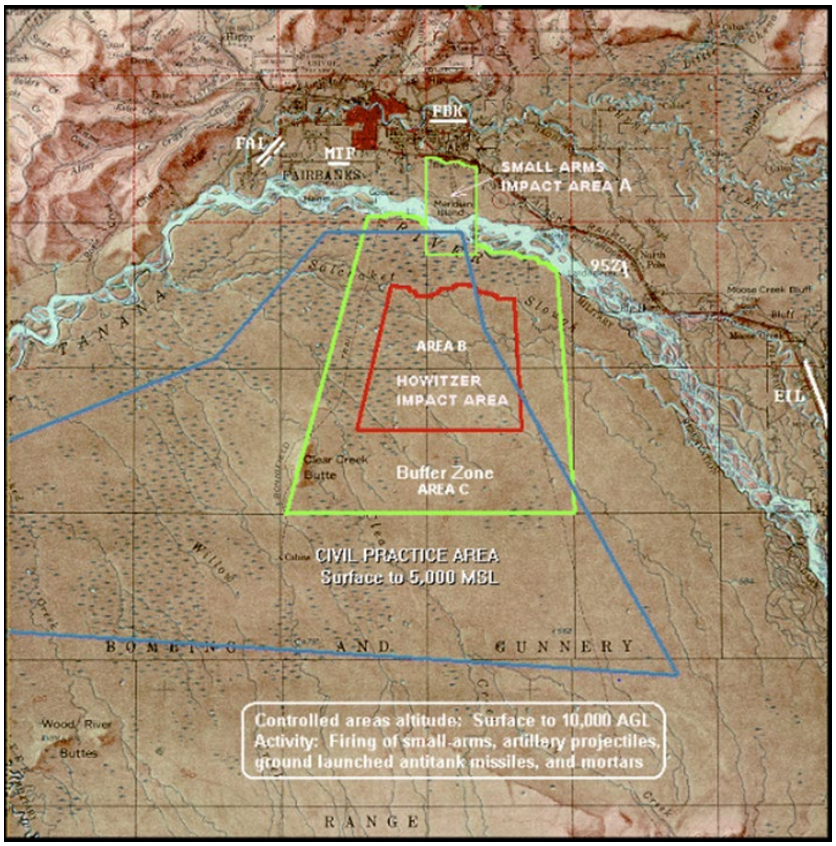


Figure 3-24: Fort Wainwright Controlled Firing Area

Military Training Routes (MTRs)

MTRs are designed for low-level, high-speed terrain following missions. These routes are provided for military training at speeds of more than 250 knots and at altitudes that range from ground level (surface) to 18,000', though most operations are conducted well below 10,000' MSL. There are more than 500 routes, roughly divided in half for VFR and IFR operations. They pose flight hazards to any uncoordinated aviation mission within their perimeters.

Table 3-1: MTR Number Assignment Chart

FAA Region	MTR Numbers with One or More Segments Above 1,500 Feet AGL	MTR Numbers for All Routes at or Below 1,500 Feet AGL
Southern	001 thru 099	1,001 thru 1,099
Southwest	100 thru 199	1,100 thru 1,199
Western-Pacific	200 thru 299	1,200 thru 1,299
	980 thru 999	1,980 thru 1,999
Northwest-Mountain	300 thru 499	1,300 thru 1,499
Central	500 thru 599	1,500 thru 1,599
Great Lakes	600 thru 699	1,600 thru 1,699
Eastern	700 thru 799	1,700 thru 1,799
New England	800 thru 899	1,800 thru 1,899
Alaska	900 thru 979	1,900 thru 1,979

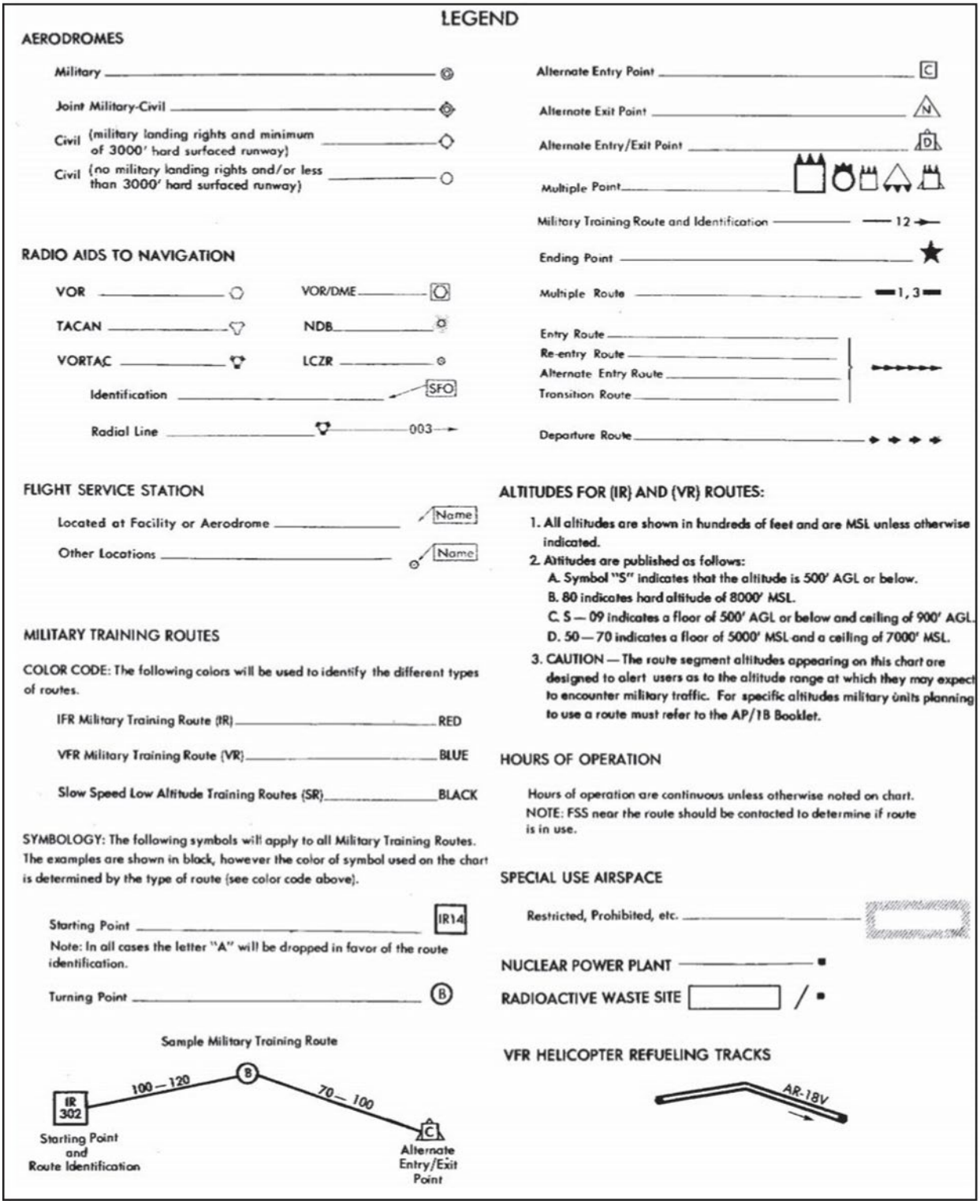


Figure 3-25: AP/1B Chart Legend

The AP/1B provides a complete description of the MTRs to include the originating/scheduling activity, hours of operation, the geographical points of each segment, altitude limitations for each segment, route width, special operating procedures, and the Flight Service Station(s) (FSS) with current information.

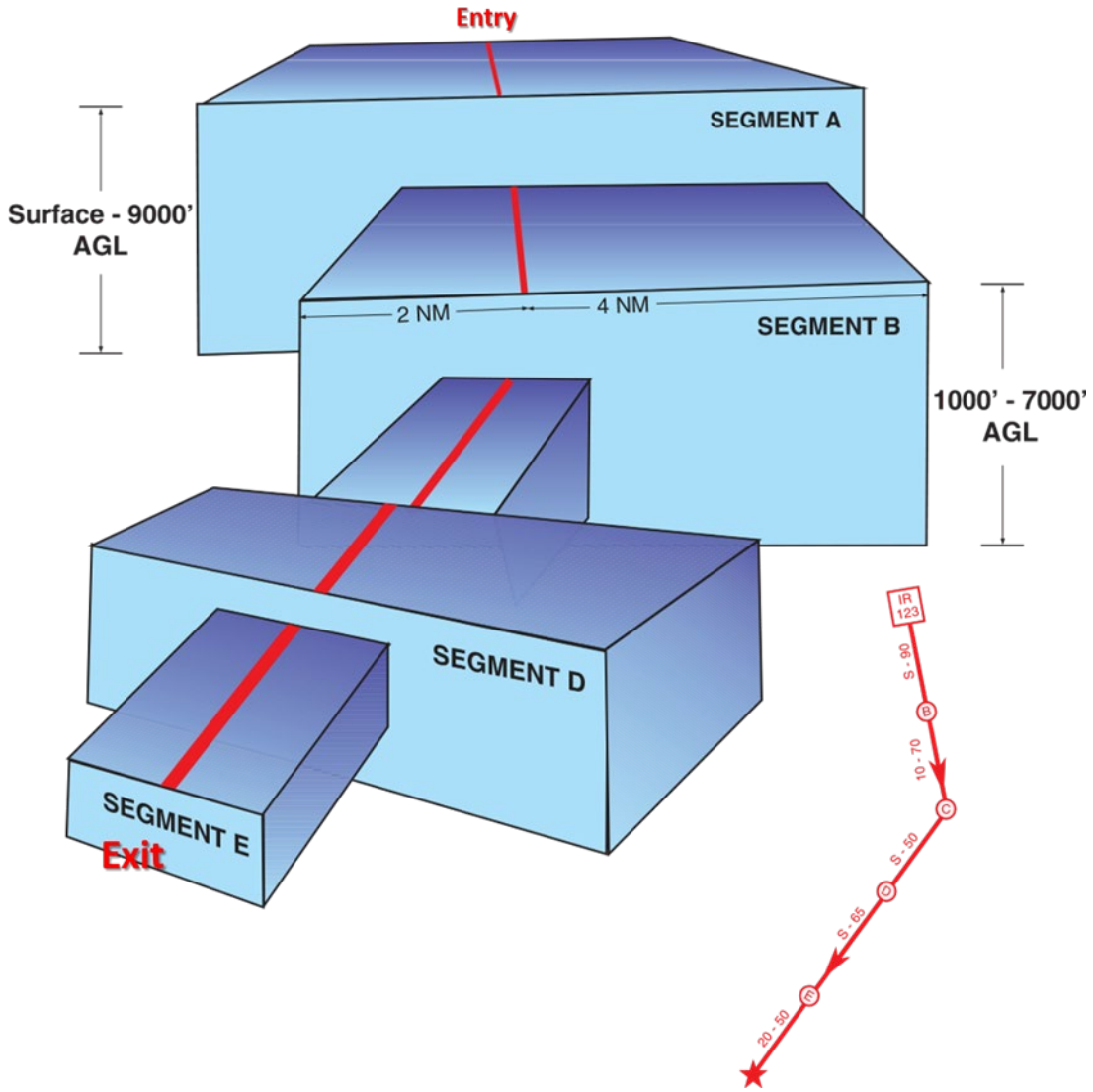


Figure 3-28: Sample Elements of an MRT

Consult the legend (Figure 3-27) in the AP/1B Chart for an explanation of other symbols. Additional symbols will indicate entry/exit points for military aircraft, turning points, departure routes, etc.

In addition to charted route altitudes, additional restrictions, or changes in width may be imposed to avoid sensitive areas or other conditions of use. These restrictions are published in the AP/1B under the standard operating procedures (SOPs) for each route.

Basic Information About MTRs

MTRs are depicted on sectional aeronautical charts as a solid gray line and a letter/number identifier.

Course widths may vary between three NM to 20 NM on either side of the gray reference line as depicted on the sectional aeronautical chart.

IR indicates the route is flown under IFR, regardless of weather conditions.

VR indicates the route is flown under VFR requiring minimum visual meteorological conditions.

IR or VR routes that include one or more segments above 1,500' AGL are identified by three numbers (i.e., IR 252).

IR or VR routes with no segment above 1,500' are identified by four numbers (i.e., VR1305)

Routes are flown in one direction on any given day. However, the same route may be flown at other times in the opposite direction. When flown in the opposite direction, the route will have a separate distinct number (i.e., IR302 and IR305 in southern Idaho and northern Nevada are flown in the same corridor, but in opposite directions, during the even vs. odd numbered months of the year).

Corridor Height (Route Floor and Ceiling)

Each route segment of an MTR is allocated a floor and ceiling altitude (see Figure 3-28). The floor may be at the earth's surface or at any altitude above the surface. Route segment altitudes are published in the AP/1B and are depicted on the AP/1B chart. Figure 3-29 shows IR-346 as displayed on the AP/1B chart that accompanies the AP/1B Handbook.

All altitudes are shown in hundreds of feet. For MTR descriptions, the floor is generally described in AGL and the ceiling in MSL. The symbol "S" indicates that the altitude is 500' AGL or less and is commonly referred to as "surface." For example, S-40 indicates a floor of 500' AGL or less, and an upper altitude limit of 4,000' MSL. The numbers "30-40" indicates a floor of 3,000' AGL and a ceiling altitude of 4,000' MSL.

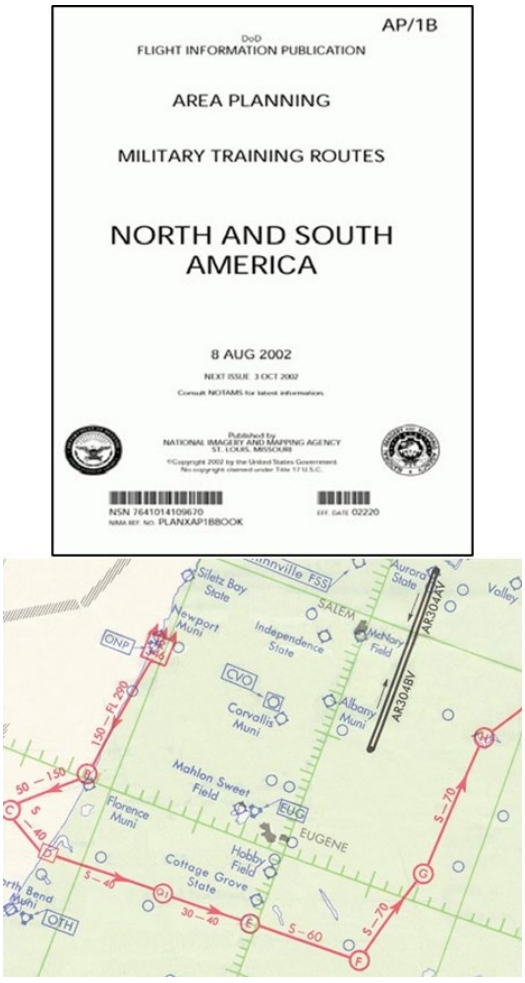


Figure 3-26: Cover of AP/1B

Corridor Widths

Lateral boundaries are described by NM left and right of the route centerline. The centerline is the focal point that determines the geographical location of an MTR corridor. It is a reference line that is not always centered. The depiction in Figures 3-28 depicts how an MTR can vary along its routing. Corridor widths and heights may vary significantly. Route widths are published in the AP/1B.

Figure 3-30 displays the AP/1B text description of the route width for VR-176. This particular MTR can be up to 58 miles wide on one segment (from Point J to K). Note the route varies in width as described.

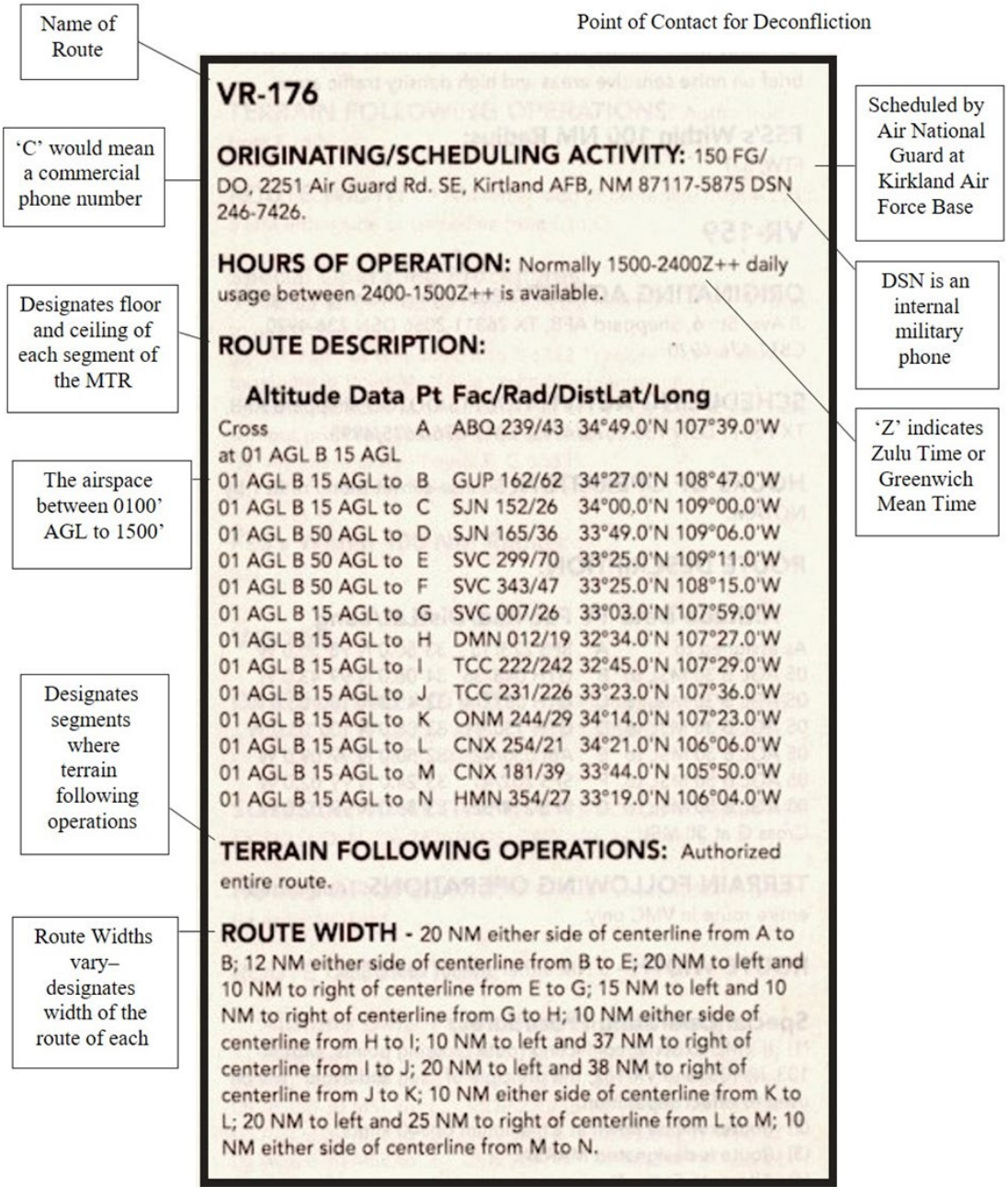


Figure 3-27: VR-176 Example from AP/1B

Maneuver Areas/LOWAT

An MTR may have a designated segment where DoD aircraft perform specific maneuvers for the purpose of simulating an aerial attack and defense response or to meet other operational requirements. Aircraft may freely maneuver within the lateral and vertical confines of the MTR segment before resuming flight on the remainder of the route. These Low Altitude Air-to-Air Training (LOWAT) areas are designated in AP/1B. There are also designated points along an MTR as alternate entrance and exit points. These features allow flexibility to use the route for various purposes to accommodate a training mission that may also require use of a MOA or airport.

MTR Coordination

Agency flight planning should take into account the existence of these routes and the risks they pose. If an agency mission is planned in the vicinity of an MTR, dispatch centers or aviation managers should consult the DoD AP/1B to determine if the route segment dimensions or altitude will affect the planned operation.

Pilots may contact the FSS to report their position, route of flight, and destination. The FSS specialist should have information available to include times of scheduled activity, altitudes in use on each route segment, and route width.

Often the FSS will only have the schedule received from the military the night before which are subject to change. Military pilots check in prior to entry on IR-MTRs. However, they are not required to check in with ATC prior to entry of VR-MTRs.

Dispatch should call the Scheduling Activity for the MTR during initial attack or when instituting a TFR near SUA, or near an MTR, to advise the military of agency aviation activity. When a non-emergency flight is being planned, dispatch can call the military ahead of time to alert them of activity.

All MTRs must be scheduled through the assigned scheduling activity prior to use although MTRs are occasionally flown without being scheduled. All pilots are reminded that a “see and avoid” strategy still applies when flying inside an MTR.

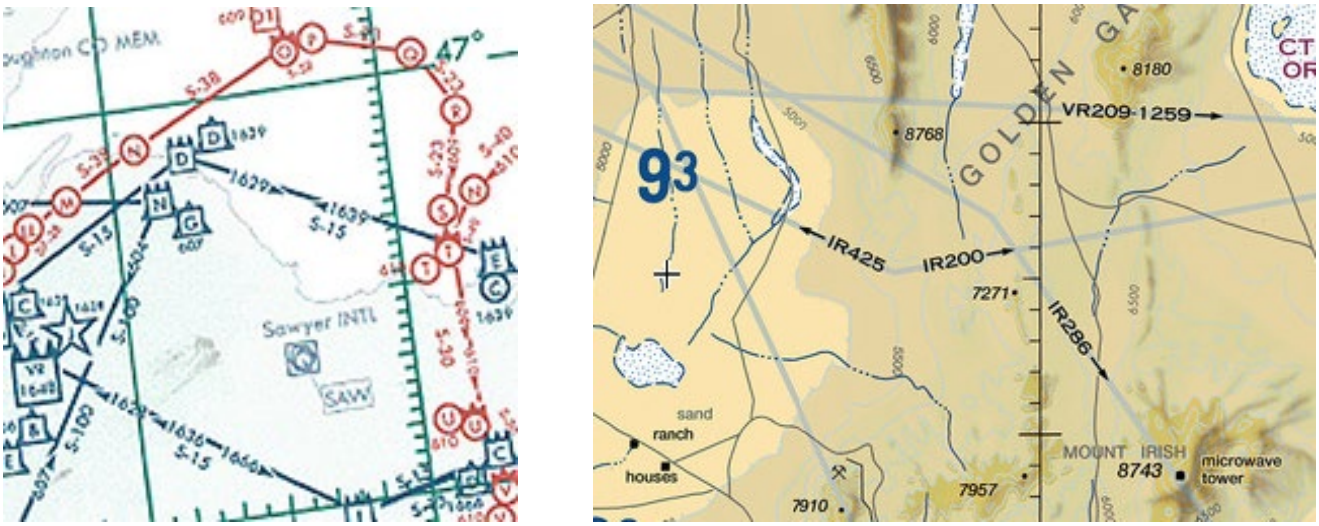


Figure 3-28: Depictions of MTRs on an AP/1B Chart and an Aeronautical Sectional Chart

Other Military Airspace Structures

Due to the unique nature of military training operations, training, and testing requirements, other airspace for special military use has been developed outside the SUA program. These are:

- Slow Routes (SR)
- Low Altitude Tactical Navigation Areas (LATN)
- Local Flying Areas
- Air Refueling Routes
- Temporary Special Use Airspace (TSUA)
- National Security Areas (NSA)
- Cruise Missile Routes

Slow Routes (SR)

Slow-speed low altitude training routes are used for military air operations flown from the surface up to 1,500' AGL at air speeds of 250 KIA or less. SR-359 is shown in Figure 3-32. Route widths are published in individual route descriptions in the AP/1B and may vary. SRs technically are not considered MTRs. High-speed aircraft are not allowed to use SR. Generally, the routes are utilized by Air Force or National Guard cargo aircraft, such as C-130s, that use drop zones for military training purposes. There are about 200 SRs in the United States. They are depicted on the AP/1B charts as a black line and are not shown on sectional aeronautical charts.

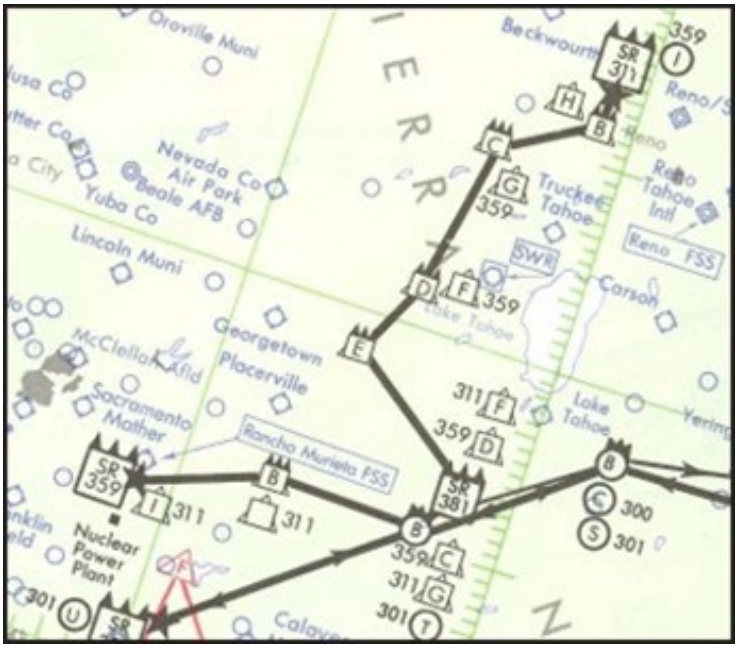


Figure 3-29: SR-359 Example from AP/1B

Low Altitude Tactical Navigation Areas (LATNs)

LATNs are large, clearly defined geographical areas where the Air Force practices random tactical navigation that typically ranges from surface to 1,500' AGL, and are flown at or below 250 KIAS. They are not mentioned in the Aeronautical Information Manual (AIM), are not charted, are not mentioned in NOTAMs. LATNs can be established anywhere in the U.S. However, are typically located near military training complexes.

Current information concerning LATNs is available by contacting the local Air Force public affairs office which can be found on each base's website. Since land management agency missions fly in these low-level environments it is recommended to proactively reach out to the Air Force in your area for LATN information, coordination, and planning.

Of note, many military aircraft operate with an FAA exemption that allows "sensitive government mission(s)" to fly without using ADS-B Out. For collision avoidance, always keep your eyes outside of the cockpit, especially when flying VFR near military bases.

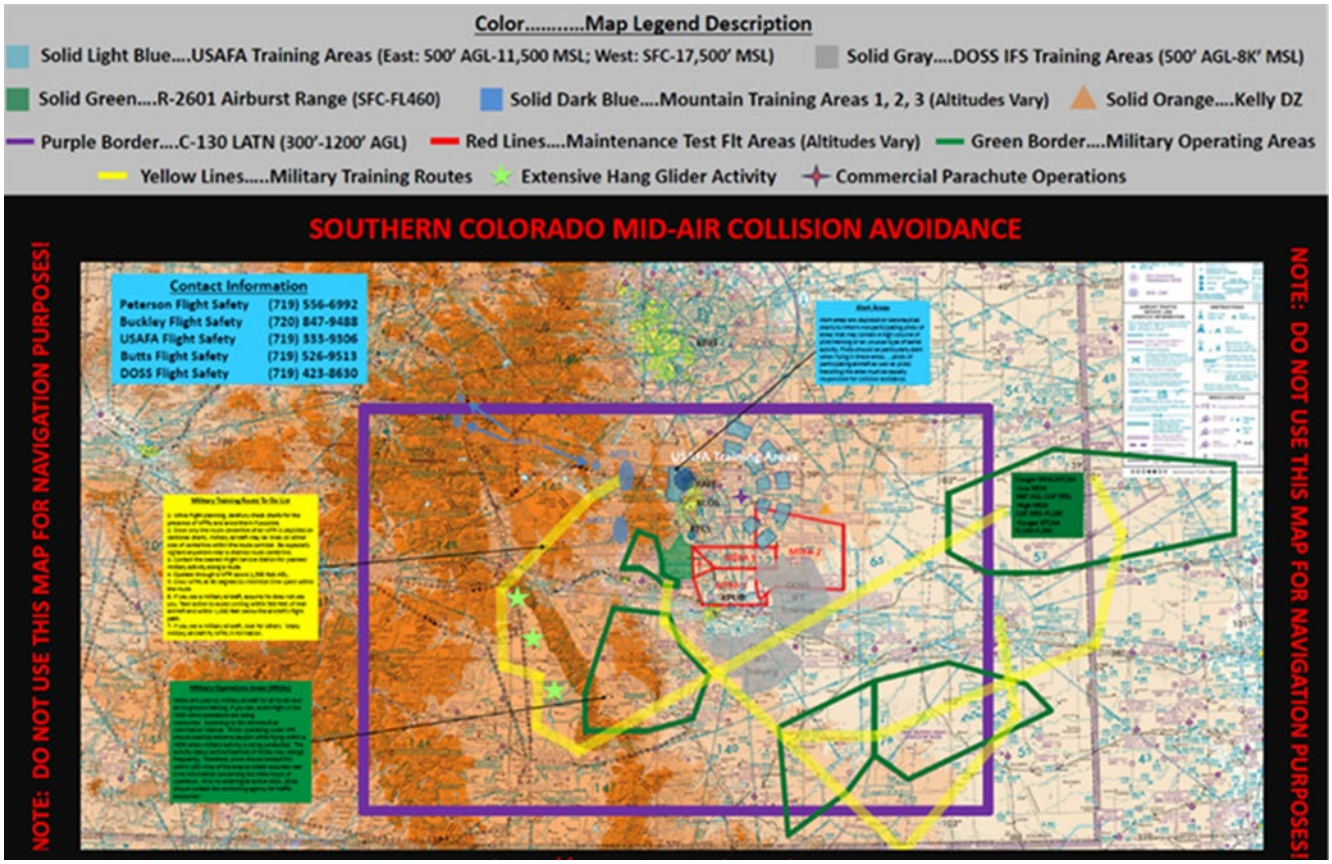


Figure 3-30: Colorado C-130 LATN Area Noted in Purple

Due to the relatively non-hazardous nature of military activity in LATNs and the slow-speed requirement, agency operations should be conducted within standard "see and avoid" parameters.

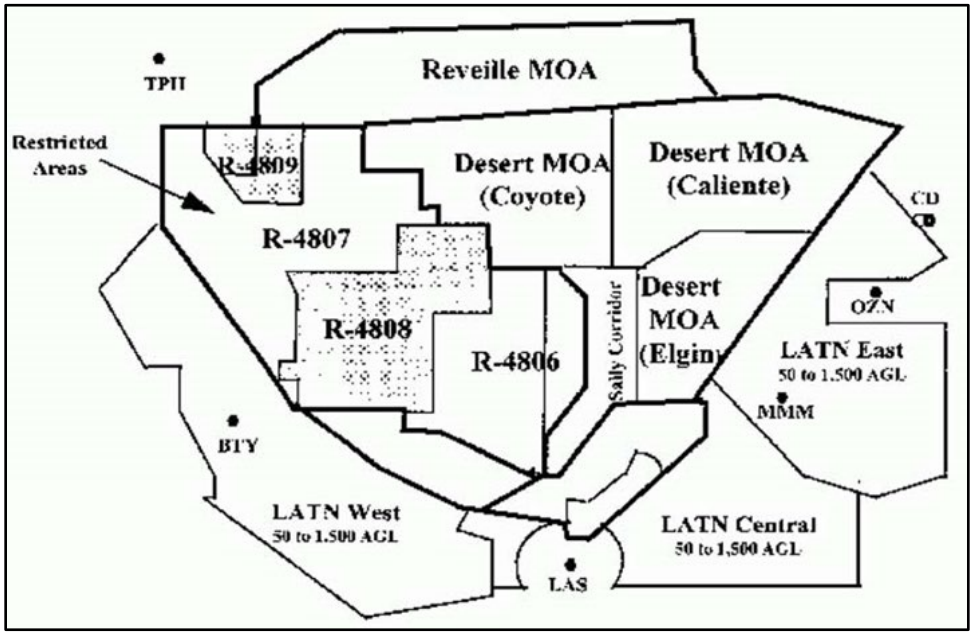


Figure 3-31: Example of LATNs North of Las Vegas

Local Flying Areas

Most military facilities develop local flying areas within which they can conduct routine, non-hazardous training activity. These areas are normally developed in conjunction with local FAA controllers and airspace managers and are developed so they will not conflict with other airspace usage.

They are locally published and although dissemination of these areas is generally limited to assigned units, the airbase airspace managers will make them available to interested parties. These areas are not depicted on sectional aeronautical charts or publications.

Local flying areas may be located by contacting the involved military unit and acquiring their maps. Often only the local people know that an area is frequented by military aircraft. It is wise to check agency aviation hazard maps and ask if the area is frequented by military aircraft, especially if there are no charted SUAs or MTRs in the area.

Aerial Refueling Routes

There are over 100 Aerial Refueling Routes utilized by the military over the United States. Most are located at high altitudes and rarely pose a hazard to agency operations. However, VFR helicopter refueling tracks may affect agency operations at lower altitudes (see Figure 3-35).

Figure 3-32: Two Types of Aerial Refueling Routes: High-Level and VFR Helicopter Refueling Routes

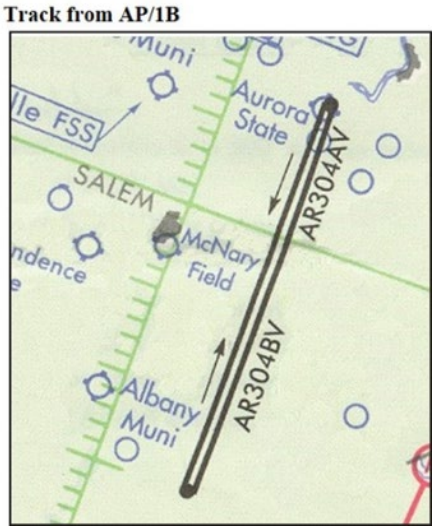


Figure 3-36 VFR Helicopter Refueling Route as Shown on AP/1B

The information about the VFR refueling tracks is located in Chapter 4 of the AP/1B. They are depicted on the AP/1B chart by double black lines. There are four types of Aerial Refueling Tracks:

1. Track 2 – 400 miles long.
2. Anchor 20 – 50 miles long, holding pattern associated with a MOA or RA.
3. Special – Anytime, anywhere (e.g., emergency, military exercises).
4. LAAR Low Altitude Air Refueling Route – below 3,000' AGL.

Some VFR helicopter refueling routes are designed to be flown at or below 1,500' AGL. They are designed to permit aircraft flying the route to avoid charted, uncontrolled airports by three NM or 1,500'. The track is normally 50 – 100 NM long and normally four NM in width either side of a centerline unless otherwise specified.

NUMBER	ARIP	ARCP	NAVIGATION CHECK POINTS	EXIT	CR PLAN	REFUELING ALTITUDES	SCHEDULING UNIT	ASSIGNED ARTCC
AR304AV	BTG VORTAC 170/30 N45°15.00' W122°44.00'	BTG VORTAC 169/36 N45°09.00' W122°44.00'		BTG VORTAC 164/75 N44°30.00' W122°44.00'	a. N/R b. N/R c. N/R d. N/R e. N/R a. Prim Freq 125.8; b. Backup Freq 291.7	03100/05000	939 RQW Portland IAP, OR DSN 638-4722 (C503-335-4722)	Seattle
REMARKS: Tanker aircraft pilots scheduled to operate within VFR Helicopter Refueling Tracks/Anchors shall advise the FSS nearest the entry point, 5 minutes prior to entering and the FSS nearest the exit point, upon exiting. Flight direction North to South. Limited to Air Force Reserve use only. Protected airspace is 4 NM either side of centerline. Track length is 45 NM. Restricted to H-60 and C-130 refueling operations. Air refueling may include multiple tankers and/or receivers. Continuous times of operations. Contact Seattle ARTCC for radar advisories and flight following. Participants will communicate with ATC during refueling operations.							
AR304BV	BTG VORTAC 164/75 N44°30.00' W122°44.00'	BTG VORTAC 164/69 N44°36.00' W122°44.00'		BTG VORTAC 170/30 N45°15.00' W122°44.00'	a. N/R b. N/R c. N/R d. N/R e. N/R a. Prim Freq 125.8; b. Backup Freq 291.7	03100/05000	939 RQW Portland IAP, OR DSN 638-4722 (C503-335-4722)	Seattle
REMARKS: Tanker aircraft pilots scheduled to operate within VFR Helicopter Refueling Tracks/Anchors shall advise the FSS nearest the entry point, 5 minutes prior to entering and the FSS nearest the exit point, upon exiting. Flight direction South to North. Limited to Air Force Reserve use only. Protected airspace is 4 NM either side of centerline. Track length is 45 NM. Restricted to H-60 and C-130 refueling operations. Air refueling may include multiple tankers and/or receivers. Continuous times of operations. Contact Seattle ARTCC for radar advisories and flight following. Participants will communicate with ATC during refueling operations.							

Figure 3-337: Helicopter Refueling Route from AP/1B

Aerial refueling may be conducted within SUA assigned altitude. This includes both low altitude (helicopter and fixed-wing) refueling as well as higher altitude tracks. Figure 3-37 depicts AP/1B chart references to Aerial Refueling Routes.

Temporary Special Use Airspace

The military and the FAA have the ability to create temporary MOAs or temporary RAs to accommodate the specific needs of a particular military exercise (see Figure 3-38). This information is available via either the NOTAM system or by direct contact with the FAA Regional Headquarters.

The FAA will publish a graphic notice into the FNS External Links on the Air Traffic Plans and Publications website early enough to provide public 28 days notification prior to the exercise start date in accordance with Charting and Publication Requirements.
https://www.faa.gov/air_traffic/publications/domesticnotices/

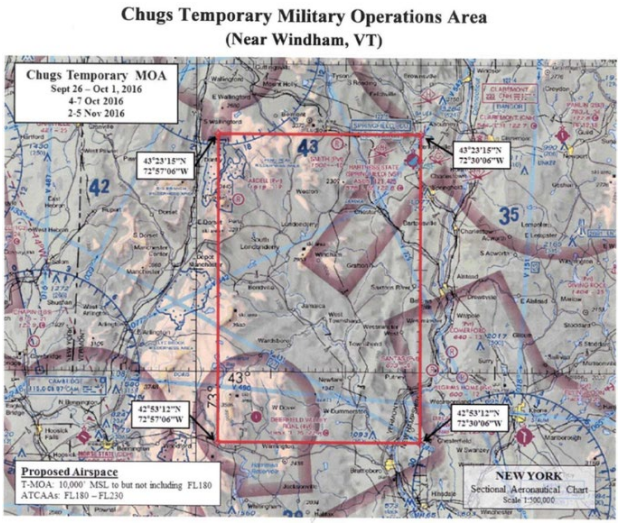


Figure 3-38: Example Temporary MOA

Cruise Missile Routes

Cruise missile operations are conducted on selected IR-MTRs. They are conducted in daylight hours under VFR conditions and may be flown in excess of 250 knots, below 10,000 MSL. Cruise missiles may be accompanied by an escort of two chase aircraft which must always maintain the ability to maneuver the missile out of the flight path of conflicting traffic. High altitude communications aircraft may be used in conjunction with the cruise missile to maintain communication and radar contact with the appropriate ATC facility. Special charting on a sectional aeronautical chart designates uncrewed aerospace vehicle routes (UAVRS). Two well-known routes are found on sectional charts in southern California and Florida.

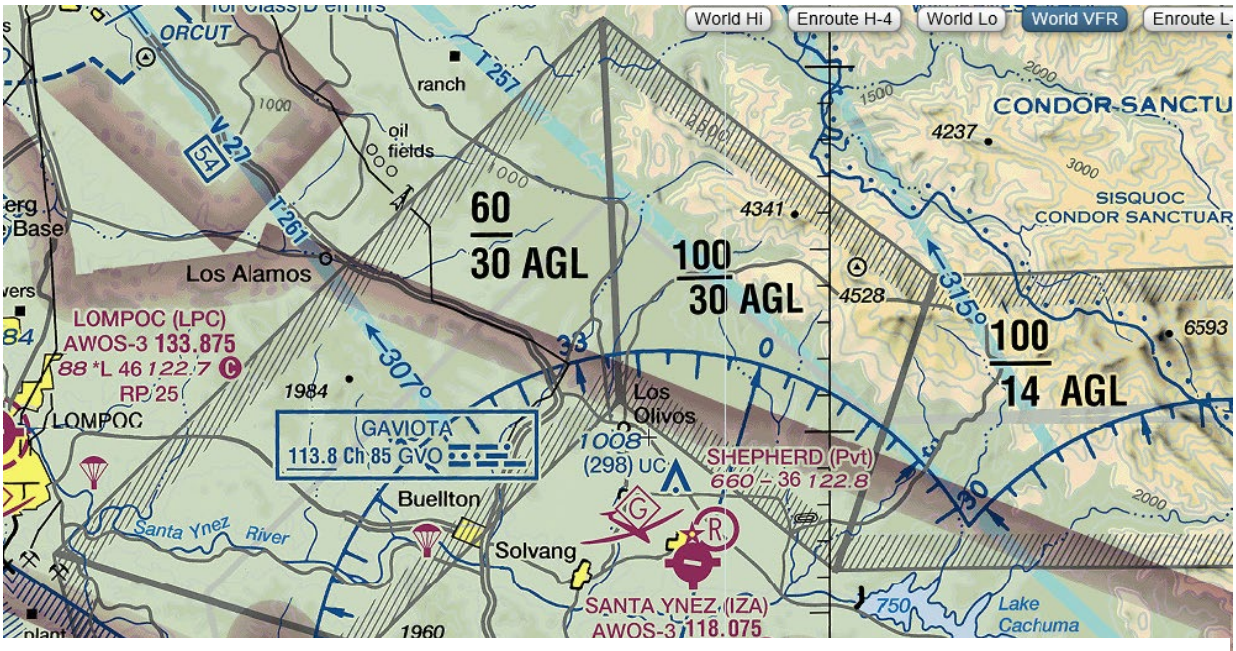


Figure 3 39: Cruise Missile Routes

National Security Areas (NSAs)

NSAs are established where there is a requirement for increased security (see Figure 3-40). Pilots are requested to voluntarily avoid flying through the depicted NSA. When necessary to provide a greater level of security, flight in NSAs may be temporarily prohibited by 14 CFR Part 99.7. NSAs are depicted on sectional aeronautical charts with a broken magenta line. Aircraft are requested to remain clear of these areas. Check NOTAMs for regulatory restrictions.

Since the tragedies of September 11, 2001, special security measures have been implemented within the United States. Pilots are advised to avoid the airspace above, or in proximity to, sites such as nuclear power plants, power plants, dams, refineries, industrial complexes, military facilities, and other similar facilities. Pilots should not circle as to loiter in the vicinity of such facilities. As always, pilots should check with the FAA for current NOTAMs.

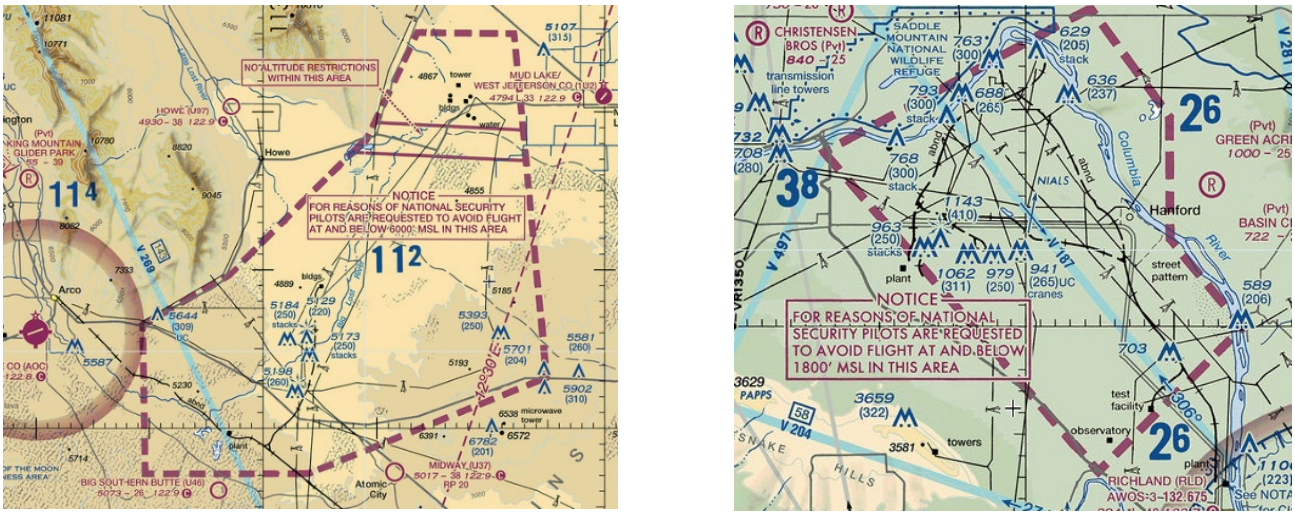


Figure 3-40: National Security Areas

Air Defense Identification Zone (ADIZ)

All aircraft entering domestic U.S. airspace from points outside must provide identification prior to entry. To facilitate early identification of all aircraft in the vicinity of U.S. and international airspace boundaries, ADIZ have been established. Generally, for all flights entering an ADIZ, a flight plan will be filed, an operating two-way radio is required, and the aircraft must be equipped with an operable radar beacon transponder with altitude reporting capability. ADIZ are normally located offshore or along the U.S. boundaries. ADIZ, or Flight Restricted Zones (FRZs) have been created over Washington, D.C., and New York City in response to recent threats.

Figure 3-41: Example of Washington, D.C. FRZ and U.S. Border ADIZ

Special Conservation Areas

Environmentally Sensitive Areas

There are areas of airspace in the United States that are considered environmentally sensitive. The physical presence or noise associated with aircraft overflight may conflict with the purpose of environmentally sensitive areas. Examples of these areas include Wilderness areas, national parks, areas with threatened and/or endangered species, wildlife refuges, Native American areas, or primitive areas.

Pilots are voluntarily requested to maintain a minimum altitude of 2,000' above the surface of the following: National Parks, Monuments, seashores, lake shores, recreation areas, and scenic river ways administered by the NPS, National Wildlife Refuges administered by the FWS; Wilderness and primitive areas administered by the USFS, etc. References are found in the AIM Sec. 7-4-6 and on each sectional aeronautical chart.

This advisory is frequently misunderstood by agency personnel. Unless there is a SFAR over the specific area, the 2,000’ minimum requested altitude is an advisory and is not regulatory in nature. It is based on FAA Advisory Circular 91-36c, “VFR Flight Near Noise-Sensitive Areas,” which defines the surface as the highest terrain within 2,000' laterally of the route of flight or the upper most rim of a canyon or valley.

The landing of aircraft is prohibited on lands or waters administered by the NPS, USFWS, or USFS without authorization from the respective agency, except at officially designated landing sites, or by aircraft on approved official government business, or when an aircraft is forced to land due to an emergency beyond the control of the operator. Federal regulations also prohibit airdrops (by parachute or other means) of persons, cargo, or objects from aircraft on lands administered by NPS without authorization from the respective agency administrator.

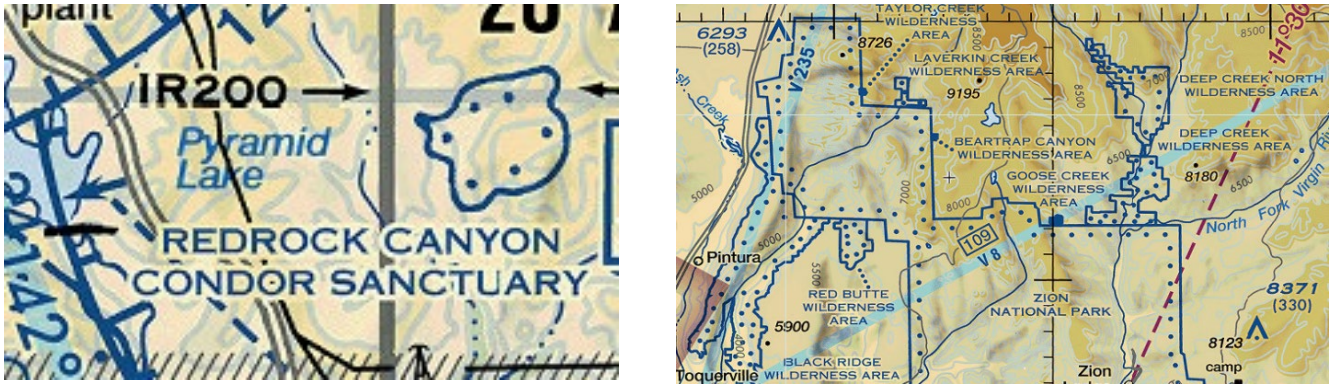


Figure 3-42: Sample of Endangered Species and Wilderness Areas on a Sectional Aeronautical Chart

Special Federal Aviation Regulation (SFARs)

Federal statutes prohibit certain types of flight activity and/or provide altitude restrictions over designated National Wildlife Refuges, National Parks, and National Forests. Examples of these designated areas are Boundary Waters Canoe Wilderness Areas, Minnesota; Haleakala National Park, Hawaii; Yosemite National Park, California; and Grand Canyon National Park, Arizona. These areas are represented on sectional aeronautical charts.

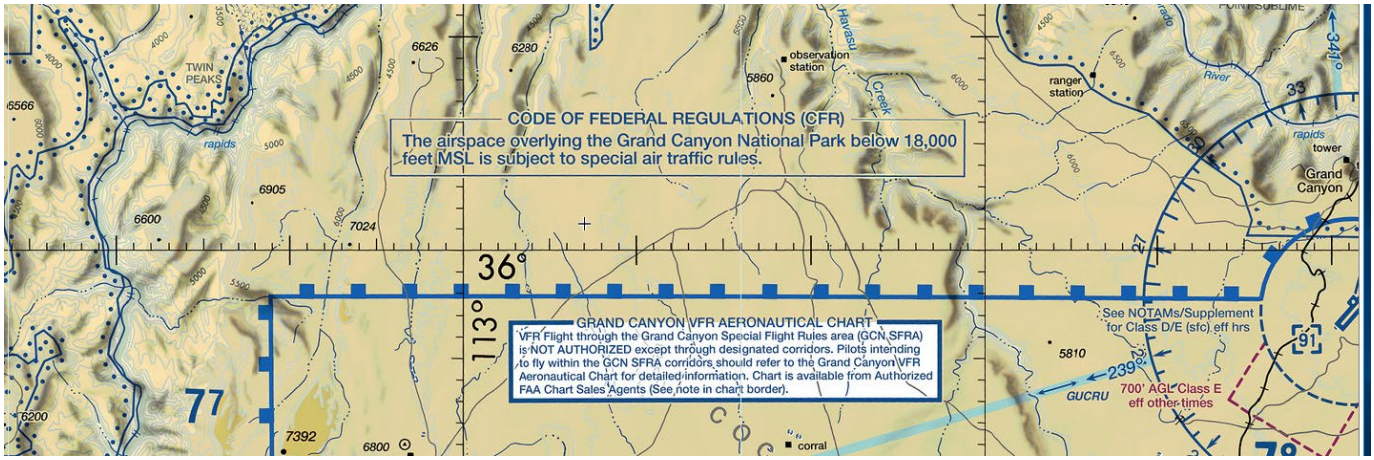


Figure 3-43: Sectional Chart Depiction of Grand Canyon National Park SFAR

NOAA Airspace: 15 CFR Part 922–Overflight Regulations for National Marine Sanctuaries

National Oceanic and Atmospheric Administration (NOAA) has amended the regulations for the Channel Islands, Monterey Bay, Gulf of the Farallones, and Olympic Coast National Marine Sanctuaries by requiring that motorized aircraft maintain certain minimum altitudes above specified locations within the boundaries of the listed sanctuaries and stating that failure to comply with these altitude limits is presumed to disturb marine mammals and seabirds and is a violation of the sanctuary regulations. The regulations were effective as of February 27, 2012.

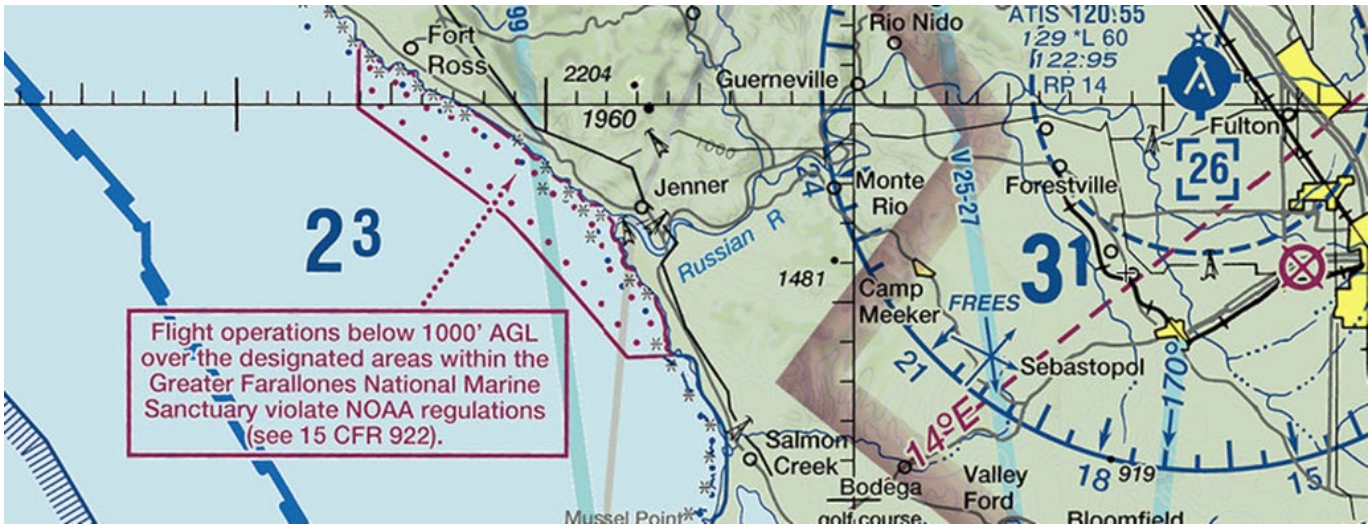


Figure 3-44: Example of NOAA Airspace

Noise Abatement Procedures

Civilian and DoD airfields may have published noise abatement procedures in their Class C-E airspace or transition routes. They may only be published by the local airport manager or noise abatement officer. Concentrated VFR traffic along these routes may result in increased mid-air potential. When operating out of an unfamiliar airport, it is recommended that pilots check with the manager to become familiar with procedures and restrictions.

SUA and MTRs also may impose noise abatement procedures on their users. Check AP/1A, AP/1B or contact the using/Scheduling Agency for specific information.

Federal Aviation Regulations of the 14 CFR

Although most people in the aviation industry understand the informal use of the acronym FAR as pertaining to the requirements of Title 14 of the 14 CFR, it is not accurate. The acronym FAR is an abbreviation for Federal Acquisition Regulations. The FAA uses CFR when referring to the Code of Regulations. For Title 14, it appears as 14 CFR.

To successfully operate within the NAS, it is necessary to have a basic understanding of the regulations and their structure. A complete listing of the regulations would require more room than this publication allows and would include a great deal that is not applicable to needs of the land management agencies. Sections of the 14 CFR that may be applicable to land management agencies are:

Part 11 General Rulemaking Procedures

Part 11 prescribes the procedures to be followed in the initiation, administrative processing, issuance, and publication of rules, regulations, and FAA orders.

Part 71 Designation of Airspace Areas, Air Traffic Service Routes, and Reporting Points

Part 71designates the airspace structure including airspace classes, airways, routes, and reporting points.

Part 73 Special Use Airspace

Part 73 designates Special Use Airspace and prescribes the requirements of the use of that airspace.

Part 77 Safe, Efficient Use, and Preservation of the Navigable Airspace

Part 77 established standards for determining obstructions in the navigable airspace and sets forth requirements for notice to the FAA Administrator of certain proposed construction or alteration. Aeronautical studies and public hearings are required to determine the effects of such proposals on the navigable airspace.

Part 91 Air Traffic and General Operating Rules

Part 91 prescribes general operating and flight rules governing the operation of aircraft within the United States and governing operation of U.S. registered aircraft outside of the United States. Sub-sections of Part 91 that may be of particular importance to land management agencies are:

14 CFR Careless or Reckless Operation

14 CFR Operating Near Other Aircraft

14 CFR Right-of-Way Rules (Except Water Operations)

91.119 Minimum Safe Altitudes

Part 93 Special Air Traffic Rules and Airport Traffic Patterns

Part 93 prescribes special air traffic rules and airport traffic patterns.

Part 95 IFR Altitudes

Part 95 prescribes altitudes governing the operation of aircraft under IFR on federal airways, jet routes, area navigation low or high routes. It also designates mountainous areas and changeover points.

Part 135 Operating Requirements: Commuter and On-demand Operations

Part 135 establishes additional operating standards and flight rules for commercial aircraft such as charter services and air tour operators.

Part 137 Agriculture Aircraft Operations

Part 137 prescribes rules governing agricultural operations within the United States.

Part 157 Notice of Construction, Alteration, Activation, and Deactivation of Airports

Part 157 pertains to the notice requirements for proposals involving construction, alteration, activation, and deactivation of civil and joint-use (civil/military) airports. It also provides for aeronautical studies to determine the effects of such proposals on the safe and efficient use of airspace.

Chapter 4 – Airspace Hazards

Introduction

This chapter provides an overview of a number of airspace characteristics, uses, or situations that require caution; some of which may not be initially apparent. Not all possible hazards can be listed. However, but many common examples have been included. With knowledge of these situations the construction of hazard maps for aviation agency purposes should be easier.

Airspace Hazards

Parachute Jump Operations

The operating rules for parachute operations are found in 14 CFR Part 105. There are published locations where concentrated parachute operations take place. These areas may be found on sectionals, in the FAA Chart Supplement, and in-Flight Information Publications (FLIP) AP/1A. A list of sport skydiving drop zones is found at the U.S. Parachute Association (USPA) website (www.https://www.uspa.org/.org). Parachute jumping areas are depicted on charts by a magenta parachute symbol (or brown on Helicopter Route Charts).

The chart symbol only defines a commonly utilized small landing area and may not depict an accurate radius where a potential hazard exists. The airspace used by modern skydiving operations typically extends upward to 14,000' MSL and may include a 5–10-mile radius area used by jump aircraft to climb to the exit altitude, and by modern wingsuit jumpers who can fly significant horizontal distances in freefall. A NOTAM D is frequently issued by an FAA FSS at least one hour before jump operations commence. Jump pilots normally broadcast an alert on the Common Traffic Advisory Frequency (CTAF) designated for a non-towered airport, one or two minutes prior to dropping jumpers over that airport.

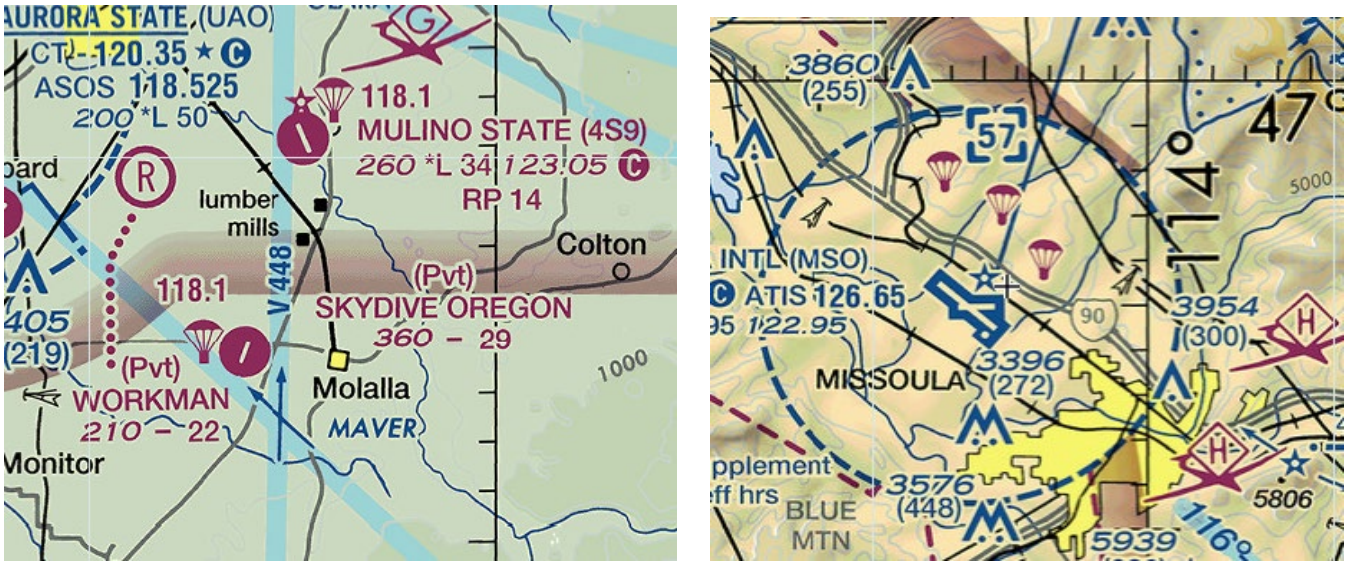


Figure 4-1: Examples of Parachute Jumping Areas Depicted on an Aeronautical Sectional Chart

Ultralights, Hang Gliders, and Paragliders

14 CFR Part 103 defines ultralights as "vehicles" (not aircraft) that are used or intended to be used for staffed operation in the air by a single occupant. In addition to ultralights and gliders, there are three winged categories: fixed-wing, flexible wing (powered parachutes and paragliders) and weight-shift. 14 CFR Part 103 describes the aircraft weight and operating parameters that define an ultralight, along with several limitations and restrictions.

The regulations do not currently require pilot certification or ultralight registration. Many user and industry groups, such as the United States Hang Gliding and Paragliding Association (https://www.ushpa.org//) and the U.S. Ultralight Association (http://www.usua.org/), may operate alternative registration, certification, and training programs that are designed to enhance the FAA's regulations.

Areas with concentrated ultralight vehicle activity are depicted on sectional charts (see Figure 4-2). However, operations commonly occur at sites that are not depicted with the glider symbol. There are an estimated 2,000 hang glider and paraglider pilots in the U.S., and the equipment they fly is light and easily portable by vehicle or on foot. Cross-country distance flights greater than three hundred miles have been flown by some of these pilots. Like any crewed aircraft, modern powered or unpowered ultralight aircraft may be found anywhere in the national airspace at any time during daylight hours. Agency flight crews should remain extra vigilant and employ see and avoid tactics when operating near popular sport aviation areas.

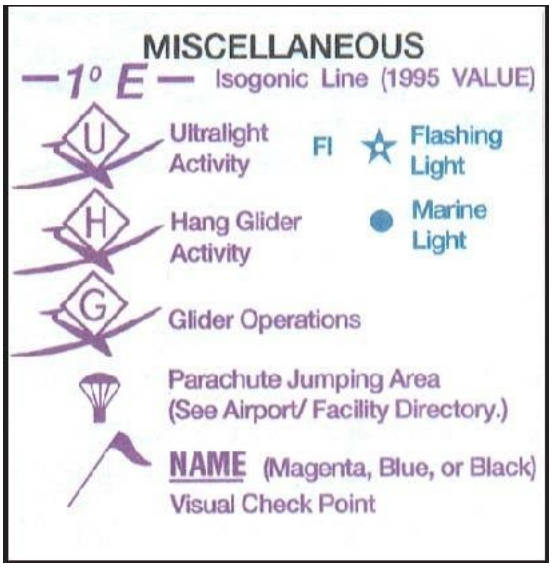


Figure 4-2: Ultralights/Gliders/Crewed Balloon Sectional Map Symbols

Sailplanes and Gliders

Glider operations are regulated by the FAA as a separate category of registered aircraft flown by certificated pilots under 14 CFR Part 91. Except for established locations where initial training, launching, and recovery occurs, glider operations are not limited to the vicinity of airports where the glider symbol is depicted on an aeronautical sectional chart (Figure 4-2 above). Sailplanes are commonly flown cross-country for hundreds of miles throughout the U.S. on any given day, whenever there is sufficient surface heating and atmospheric instability to produce thermals. High altitude mountain wave flights regularly occur in some areas of the country to altitudes in excess of 25,000' when the operator acquires a waiver from the FAA to fly above 18,000' Class A airspace. Additional

information about sailplanes and soaring can be found at the Soaring Society of America (SSA) website, www.ssa.org.

Bird and Animal Wildlife Strikes

Bird strikes in the national airspace pose a significant safety hazard. The Wildlife Services (WS) program of the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) works closely with the FAA, DoD, and the aviation industry to reduce wildlife hazards at airports nationwide. Collisions between aircraft and wildlife at airports have risen dramatically in recent years as a result of population increases in many species, quieter aircraft, an increase in air traffic, and an expanding urban environment.

WS researchers and the FAA believe that about 80% of wildlife aircraft strikes go unreported which makes detection and management of wildlife hazards much more challenging. Between 1990 and 2007, birds accounted for about 98% of some 88,000 reported aircraft collisions. There were over 750 reported collisions with deer and other mammals on runways and taxiways during this same period of time.

The potential for bird strikes is highest during daylight hours and increases during the bird migration months of March-April and August-November. Although 90 percent of migratory flights occur below 5,000' MSL, waterfowl have been reported as high as 37,000' MSL with other bird species spotted as high as 54,000'.

There are four major migratory flyways in North America shown in Figure 4-3 below. There are 500 million to 1 billion birds that migrate in the national airspace at altitudes ranging from less than 100' AGL to over 37,000'.

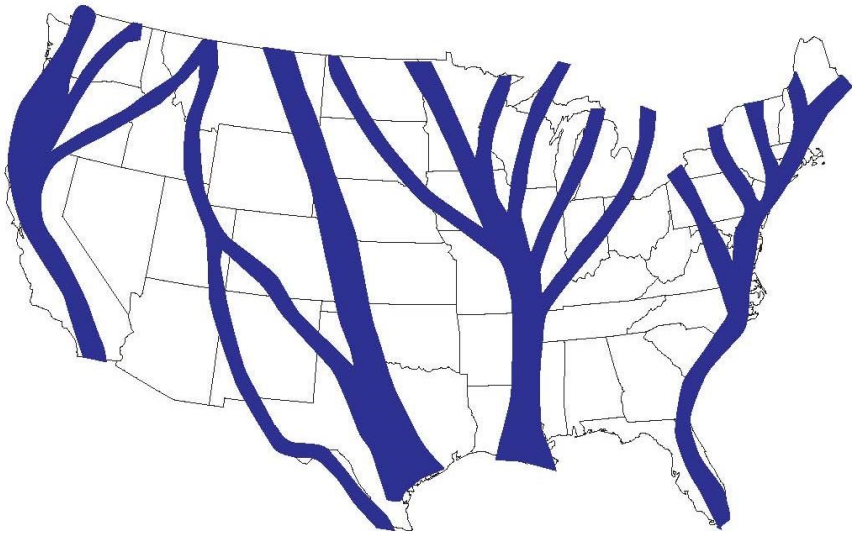


Figure 4-3: Four Major Migratory Flyways

Pilots, aviation, and airport personnel should report every wildlife strike to the U.S. DOT FAA using the 5200-7 form (https://www.faa.gov/forms/index.cfm/go/document.information/documentID/185872). The form is also available at https://wildlife.faa.gov/strikenew.aspx. The data derived from these reports is used to develop standards to mitigate this potential hazard to aircraft and for documentation of necessary habitat control on airports. Additional information related to reporting bird strikes is found online at the Airport Wildlife Hazard Mitigation website of the William J. Hughes FAA Technical Center at http://wildlifecenter.pr.erau.edu/ or at the military Bird/Wildlife Aircraft Strike Hazard (BASH) website at http://www.safety.af.mil/Divisions/Aviation-Safety-Division/BASH.

Patrol Aircraft

There could be several types of non-military, low altitude patrol operations conducted by drones, fixed-wing, or rotary aircraft in your area. Some of these operations may include law enforcement, border patrol flights, utility company surveys of transmission lines and stations, pipeline surveys, aerial spraying on private or public lands, other agencies administrative and support flights (e.g., NASA, DOE, etc.), air rescue, and medivac flights. In addition, the Civil Air Patrol may fly grid searches for missing aircraft at any time or fly MTRs at the request of DoD to check for low-level aviation hazards. Agency personnel should establish contact with these organizations to deconflict whenever possible. At a minimum, it is beneficial to know the type of aircraft, schedule, and altitude of any planned activity.

Military Chaff and Flares

Chaff is a type of defensive countermeasure made up of finely shredded metallic strips used by the military to interfere with the enemy's radar capacity to lock on or identify an aircraft with radar. Chaff may be released at any altitude and float slowly down, creating a reflective screen and hiding the aircraft's position. Chaff is commonly used for military training and can have a significant effect on FAA radar systems. The military has standing FAA approval to use chaff in most MOAs, Restricted, and WAs.

Flares are a type of airborne defensive countermeasure dispensed to divert heat seeking missiles. Depending on wind and altitude launched, flares can appear to "hang" in the sky or have a slow descent rate. Flares used today by the military are normally self-destructive, meaning they are launched at sufficient altitudes to complete its burn before reaching the ground, leaving no trace except a small metallic tab. The military has standing FAA approval to use flares in most MOAs, Restricted, and WAs. During fire season, the military will restrict its pilots from dropping flares at lower altitudes to help mitigate the potential of igniting new fires.

Ground-Based Operations

Ground-based operations include moored balloons, kites, amateur rockets, uncrewed free balloons, and certain model aircraft. 14 CFR 101 addresses the operating requirements and restrictions for these activities. These operations are usually contained within a specific area, although uncrewed rockets and balloons may reach considerable altitudes or trajectories before falling to earth. In both cases, there are specific weight and size limitations imposed to qualify under this regulation. 14 CFR 101 warns operators to not operate in a manner that creates a hazard to other persons or their property, and to not allow an object to be dropped from their platform if such action creates a hazard to other persons or their property.

Moored Balloon and Kites

A 14 CFR 101 regulated moored balloon is defined as any balloon that is moored to the surface of the earth, or an object thereon that has a diameter of more than six feet, or a gas capacity of more than 115 cubic feet. A 14 CFR 101 regulated kite is any kite that weighs more than five pounds and is intended to be flown at the end of a rope or cable. Operation of a moored balloon or kite between sunrise and sunset requires marking of mooring lines with colored pennants or streamers. The FAA requires obstruction lighting to serve as a visual warning for operations conducted between sunset and sunrise. Moored balloon or kite operations more than 150' above the surface of the earth require at least 24 hours advanced notice for coordination with the FAA ATC facility nearest to the place of intended operation. In many cases, moored balloon areas have been established as RAs due to their extreme hazard. *Note the MEF is adjusted to reflect the altitude of highest known hazard within a given 30-minute Latitude Longitude grid square.*

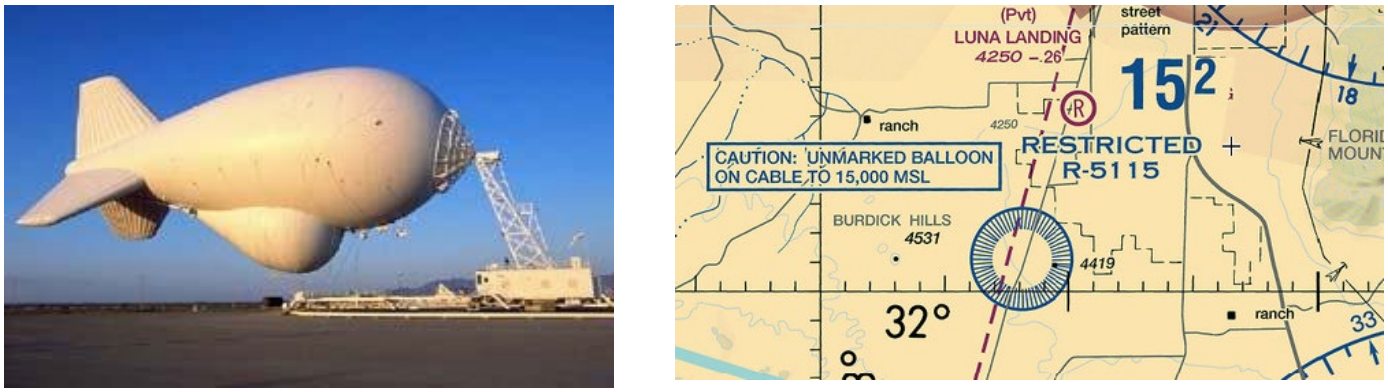


Figure 4-4: Example of a Tethered Aerostat Radar System and Sectional Chart Image of Moored Balloon Hazard Area.

The Tethered Aerostat Radar System is a balloon-borne radar system which provides low-level radar surveillance data in support of federal agencies involved in the nation's drug interdiction program. The aerostat is a large fabric envelope filled with helium. It can rise to 15,000' while tethered by a single cable, which has a maximum breaking strength of 26,000 pounds. Normal operating height is 12,000' MSL. The average aerostat is about two times the size of the Goodyear blimp. For security and safety reasons, the airspace around USAF aerostat sites is restricted for a radius of at least two or three statute miles and an altitude up to 15,000'.

Amateur Rockets

An uncrewed rocket has three different classes that falls within specific weight and material criteria and normally does not include aerial fireworks displays or model rockets (addressed below). Operation of uncrewed rockets requires advance coordination with the FAA ATC facility nearest to the place of intended operation. They are uncrewed and the launch must not create a hazard to persons, property, or other aircraft. Specifics are addressed in 14 CFR 101 Subpart C.

Uncrewed Free Balloons

Uncrewed free balloons that meet specific payload and load separation criteria are required to comply with 14 CFR 101 Subpart D and will coordinate with the FAA ATC facility nearest to the place of intended operation within six to 24 hours prior to the beginning of the operation. A launch notice to the FAA or military ATC facility near the place of intended operation is also required immediately after balloon launch. Uncrewed free balloons may be equipped with trailing antennas or other suspension devices that may require appropriate obstruction markings. Specific operating limitations that address altitude, weather, and airspace are in place. (Some weather balloons do not meet 14 CFR 101 criteria and may not be coordinated with ATC.)

Model Aircraft

Local individuals and organizations may be involved in recreational model aircraft clubs or events. The aircraft are flown strictly for hobby or recreational use and are operated in accordance with a community-based set of safety guidelines, and within the programming of a nationwide community-based organization. The aircraft are limited to no more than 55 pounds unless otherwise certified. When flown within 5 miles of an airport, the operator of the aircraft provides prior notice of the operation to the airport operator at non-towered airports, or an ATC tower when flying in Class D airspace. Altitudes used can be relatively low (below 1,500' AGL) for model aircraft, but some model rocket clubs operate to altitudes in excess of 18,000' MSL and may incorporate larger areas.

Unmanned Aerial Systems (UAS)

UAS operations have become exceptionally popular and common in the past few years. Operations associated with a business or research are regulated by the FAA under 14 CFR Part 107. Hobbyist UAS operations conducted for personal recreation are not regulated, although suggested best practices are offered in FAA Advisory Circular AC 00-57A. In addition to information provided at https://www.faa.gov/, there are several other websites such as https://knowbeforeyoufly.org/home that provide information on regulations, drone registration and operating requirements, and airspace where UAS are allowed to fly. Due to the number of affordable UAS available on the market and the current wave of popularity, regulatory compliance within this user group has proven to be one of the greatest challenges the FAA has faced in recent years. As of 2018, over one million drones have been sold in the U.S., and more than 40,000 operators have acquired the FAA Part 107 Remote Pilot Certificate to do filming, inspections, and other commercial operations. These numbers are expected to triple in the next five years.

Lasers

Outdoor laser demonstrations are increasing in popularity in conjunction with entertainment and promotional uses. When laser beams are projected or reflected into the navigable airspace, the potential exists for injury to pilots and passengers of aircraft ranging from temporary flash blindness to permanent blind spots or other eye injury. Aiming a laser at an aircraft creates a serious safety risk and violates federal law. Since June 2011, there has been a significant increase in the number and frequency of laser incidents reported. The FAA works with law enforcement agencies at all levels to assist with criminal prosecutions against those who violate Federal Aviation Regulations by shining lasers at aircraft. Laser incidents should be reported to the FAA at https://www.faa.gov/aircraft/safety/report/laserinfo/. Written notification to the FAA is required before conducting an authorized public event in which an outdoor laser demonstration is planned. An FDC NOTAM is normally issued by the FAA to identify when and where these sanctioned events may occur.

Blasting

There are two issues that present airspace hazards in blasting: flying rock debris and premature detonation of electric blasting caps (EBCs). Operations such as fireline explosives that use non-electric blasting caps (NONEL) are not at risk. The DoD is concerned that electronic warfare equipment on certain military aircraft could initiate a premature explosion of blasting equipment. Permanent blasting sites such as rock quarries are listed in NOTAMs or in the DoD AP 1/B Publication.

Agency blasters are encouraged to work with aircraft dispatchers who should notify DoD schedulers at least 24 hours in advance of any blasting sites located under MTRs or SUA. Notification should include the latitude/longitude of site, the date and time of planned blasting activity, the affected military airspace or MTR segment, and an agency contact name and phone number.

Before conducting small-scale agency blasting activities such as road or trail maintenance, land management agencies should request that a NOTAM (D) be issued by the FAA (See Chapter 6 for instructions on how to request a NOTAM [D].) Large commercial rock quarries and mining operations that use a significant volume of dynamite for blasting will sometimes request a blasting TFR under 14 CFR 91.137 (a)(1).

Obstacles, Antenna Farms, and Power Lines

The proliferation of tall towers in support of cellular communications and other technologies has resulted in an expansion of the FAA's obstruction evaluation (OE) process to evaluate, mitigate, or eliminate the impact of towers or other obstructions to airspace. Aeronautical studies are conducted to determine the impact of an object on the safe and efficient use of airspace. By congressional mandate, the FAA can NOT prohibit any construction activities. Instead, the FAA evaluates the proposed construction, and as necessary works with the proponent to mitigate any impact that may result.

14 CFR Part 77 (Construction or alteration requiring notice), and FAA AC 70/7460-1L (Obstruction Marking and Lighting) provide criteria and guidance for the FAA evaluation of construction of synthetic obstacles that may affect navigable airspace. When the FAA evaluation determines the proposed construction would constitute a hazard to air navigation, the FAA may require appropriate lighting and/or marking to make the obstacle more visible to pilots. In many cases, the studies are circularized for public comment. Proposals that require public notice include those that affect a public use airport, or ones that require a change in aeronautical operations or procedures.

Land management agencies should monitor proposed obstructions within their units and provide comment to the FAA facility performing the evaluation. Visit the obstruction evaluation/Airport Airspace Analysis (OE/AAA) webpage for information (https://oeaaa.faa.gov/). Whenever possible, encourage utility companies to bury transmission and utility lines in the vicinity of commonly used airports and agency air bases. Where this is not possible, reflective, and other visual markers may be recommended to provide increased visibility of the wires. Pilots operating in these areas should be thoroughly briefed as to potential hazards and reminded of the need to perform a high-level reconnaissance to locate and identify hazards prior to descending to operate in the low-level environment. Missions should be planned so as to avoid low-level flight in these areas whenever possible. Dispatchers and aviation managers should maintain current hazard maps and relay this information to affected pilots.

The symbols for ground-based obstructions depicted on an aeronautical sectional chart are shown in Figure 4-6.

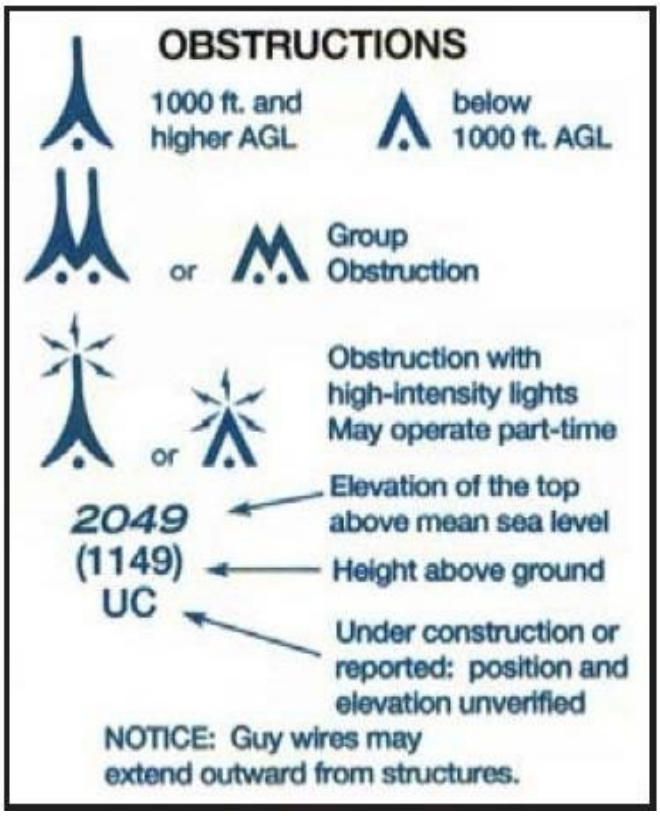


Figure 4-5: Obstruction Symbols Found on Aeronautical Sectional Charts

Wind Energy:

For over a decade, wind energy has been the fastest growing energy technology worldwide, achieving an annual growth rate of over 30%. Wind turbines that use the energy of the wind to generate electricity are often connected in large groups and are usually mounted on tall towers 200' or more above the earth's surface and are normally lighted and painted white for maximum visibility. Meteorological Evaluation Towers (MET Towers) are temporarily erected to assess the suitability and practicality of potential locations for future wind energy turbines. These towers are often less than 200' tall, are not shown on aeronautical sectional charts, and are usually not lighted or painted due to their limited height.

With the signing of the 2008 Wind Energy Protocol, the DoD and DOI BLM commit to work together to facilitate compatible land-use planning and review of wind energy right-of-way (ROW) applications on BLM administered public lands. This is accomplished with DoD input due to the frequent military activity that regularly occurs in the overlying SUAs and MTRs over public lands. BLM District offices will normally know where land-use permits have been issued for MET Towers and wind turbines. Dispatchers and aviation managers should continually update hazard maps as new sites are identified.

Chapter 5 – Airspace Tools and Skills

Introduction

Airspace coordination requires a variety of skills: map reading and interpretation, aptitude to plot latitude/longitude, and ability to plot bearing/distances off navigational aids. There are many tools for assistance in airspace coordination. This chapter will be presented in four sections:

1) Charts and Sectionals
2) DoD Publications
3) Technology
4) Airspace Coordination Skills

Charts and Sectionals

Agency personnel need information to assess the degree of complexity of the airspace overlying local public lands. This information is available from a variety of sources. Some of these sources contain duplicate information while others may be the sole source of a particular piece of information. It is important to obtain and have access to various sources to ensure that the local airspace "picture" is complete.

An aeronautical chart is a map used in air navigation containing all or part of the following: topographic features, obstructions, navigation aids, navigation routes, designated airspace, and airports. There are a variety of charts available.

1) VFR Charts include the following:
    - Sectional Aeronautical Charts (Sectionals)
    - TAC
    - Helicopter Route Charts
2) IFR Charts include the following:
    - En Route Low Altitude Contiguous U.S.
    - En Route High Altitude Contiguous U.S.
    - Alaska Charts
    - Pacific Charts

Each office with responsibility for scheduling, dispatching, or requesting aircraft should maintain current aeronautical sectionals in a location where the aircraft dispatcher or aviation manager has immediate access to them. Areas of military airspace (SUAs, MTRs, etc.) should be highlighted.

Sectional Aeronautical Charts

Sectionals are designed for visual navigation of slow or medium speed aircraft. Topographic information consists of contour lines, shaded relief, drainage patterns, and an extensive selection of visual checkpoints and landmarks used for flight under VFR. These charts also include cities, towns, roads, railroads, and other distinct landmarks. Aeronautical information includes visual and communication/ navigation aids, airports, controlled airspace, SUA, obstructions, and related areas.

Sectionals are revised every 56 days and most Alaska charts are updated annually. If sectionals are used as a basis for a posted hazard map they need to be updated promptly. Sectional charts may be found at https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/dafd/

Sectionals are on a 1:500,000 scale (1 inch = 6.86 NMs). They cover the entire United States and are separated into geographic sections by places (Phoenix, Billings, etc.).

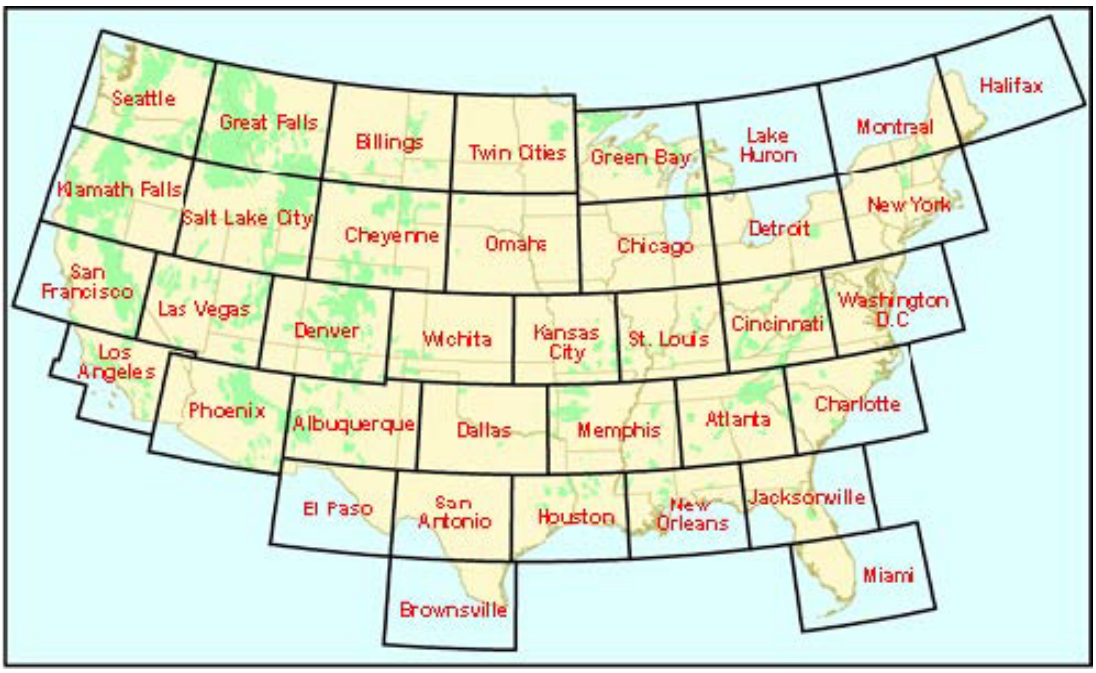


Figure 5-1: Sectional Geographic Boundaries

Sectionals contain the most complete information available in one document for visual flight navigation; however, the user is cautioned that not all information is portrayed. The following information is depicted:

- Airport and permanent heliport locations and data.
- Radio aids to navigation and communication.
- VORs such as Very High Frequency Omnidirectional Range Collocated Tactical Air (VORTACs) and VOR-Distance Measuring Equipment (DME).
- Obstructions (not all are shown; those shown are predominantly >200' AGL).
- Topographic information.
- Special conservation areas such as federal Wilderness areas and wildlife refuges.

- Airport traffic service and airspace information.
  - Class B, C, D, and E controlled airspace around busy airports.
  - Transition areas.
  - Special air traffic rules such as Grand Canyon National Park.
  - Low altitude federal airways.
  - Mode C areas (altitude reporting system used in ATC).
  - National Security Areas (NSA).
  - MTRs; centerline reference only; most but not all routes are depicted, such as the Sidewinder route in R-2508.
  - Special Use Airspace (MOAs, RAs, etc.); margin notes of the Sectional Chart detail the location, time of use, altitudes used, and the controlling/contact agency of each SUA.
- Mapping source information.

Table 5-1: Mapping Sources Information.
(Information provided from various mapping sources.)

	Information Provided	Sectional Chart	AP1A Hdbk	AP1B Chart	AP1B Hdbk	SUA FAA	Sky Vector
MTRs	Route Centerline	Yes	N/A	Yes	Yes	Yes	Yes
	Route Width	No	N/A	No	Yes	Yes	No
	Route Altitudes	No	N/A	Yes	Yes	Yes	No
	Scheduling Activity	No	N/A	No	Yes	No	No
	Originating Activity	No	N/A	No	Yes	No	No
SR	Slow Routes	No	N/A	Yes	Yes	Yes	Yes
SUA	Airspace Lateral Boundaries	Yes	Yes	N/A	N/A	Yes	Yes
	Airspace Vertical Boundaries	Yes	Yes	N/A	N/A	No	No
	Controlling Agency	Yes	Yes	N/A	N/A	No	No
	Using Agency	No	Yes	N/A	N/A	No	No
	Scheduling Agency	No	Yes	N/A	N/A	No	No
CFA	Controlled Firing Areas	No	No	N/A	N/A	No	No
LATN	Low Altitude Tactical Navigation	No	No	N/A	N/A	No	No
AR	Aerial Refueling Routes (Low-Level)	No	No	Yes	Yes	No	No

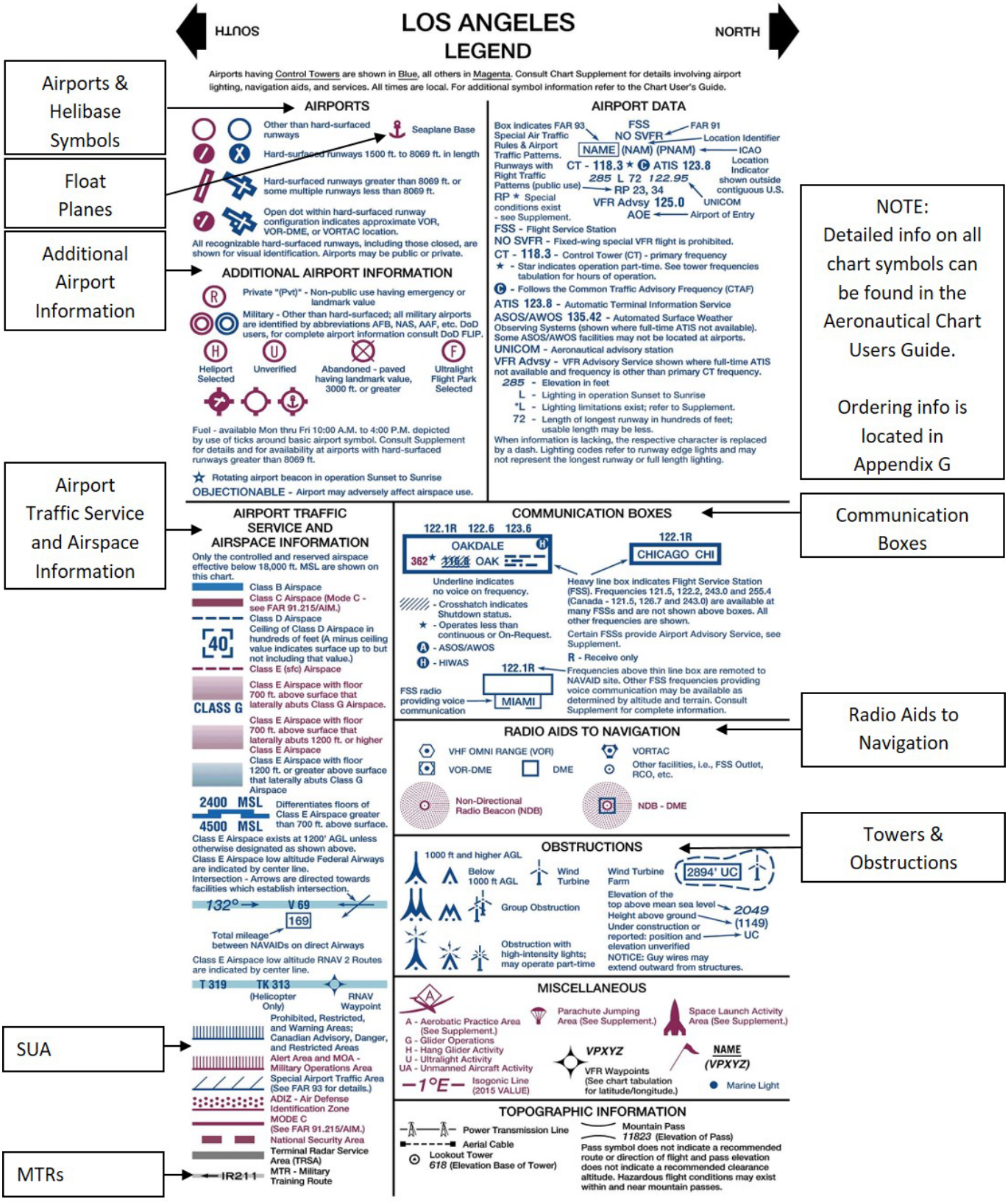


Figure 5-2: Overview of Basic Airspace Symbols on a Sectional

Helicopter Route Charts

Helicopter Route Charts are graphic portrayals of discrete and/or common use helicopter routes and/or operating zones located in high-density traffic areas. Their purpose is to facilitate helicopter pilot access into, egress from, or operation within a charted area. They generally will include associated altitude or flight ceiling information to facilitate avoidance of IFR traffic and pilot adherence to minimum safe altitude requirements. The charts provide expanded, and in some cases unique ground reference symbols to improve visual navigation.

En Route Low Altitude Charts

En route Low Altitude Charts provide aeronautical information for en route instrument navigation (IFR) below 18,000' MSL. They are revised every 56 days. Chart information includes airways, limits of controlled airspace, minimum en route and obstruction clearance altitudes, airway distances, reporting points, RA, and related data. One of the most useful depictions for airspace coordination found on this chart are the division boundary lines between the ARTCCs throughout the U.S.

En Route High Altitude Charts

En route High Altitude Charts provide aeronautical information for en route instrument navigation (IFR) above 18,000' MSL. They are revised every 56 days. Chart information includes jet routes, identification and frequencies of radio aids, selected airports, distances, time zones, SUA, and related information.

Digital Aeronautical Charts

FAA CHARTS: An Aeronautical Raster Chart is a digital image of an FAA VFR Chart. All information that is part of the paper chart is included in the file. The area inside the neat line is georeferenced to the surface of the earth. Only the main body of the chart is accurately georeferenced. Each digital-Visual Chart is provided in one TIF file. The files are 300 dots per inch and 8-bit color.

Electronic Aeronautical Raster Charts in GEO-TIFF format for GIS and PDF format for non-GIS use are available at the main digital products site: https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/.

As each paper chart is updated, its raster equivalent is also updated and available for viewing on the website. Ensure that the most current charts are used by referring to the chart legend. Current sectional charts and future charts are available 20 days prior to publication. The FAA digital-Visual Chart series is designed to meet the needs of users who require georeferenced raster images of FAA VFR charts.

FAA Digital Chart Viewers and Editors: The raster data may be viewed using a geographical information system to take advantage of the georeferenced nature of the data or the data can be viewed using commonly available image viewing software (Adobe Photoshop, Microsoft PowerPoint, etc.). GIS specialists use Environmental Systems Research Institute (ESRI) ArcGIS or other newer software applications for creating Charts using georeferenced map layers for specific surface fire map applications. These tools may be useful for airspace coordination to create circles of any diameter and various polygon shapes. Websites such as Skyvector display sectional charts, but the drawing capability is limited to polygon TFRs using the flight planning feature.

Complete sectionals can be viewed as PDF sectional files using Acrobat Reader. However, there are no tools available to modify the chart or crop it for small maps. There are other applications that view PDF files. Full sized charts can be printed from plotters capable of printing a 40" wide sheet.

DoD Publications

The National Geospatial-Intelligence Agency (NGA) produces DoD FLIP. These publications consist of books and charts which are critical for accurate deconfliction. They are a valuable resource for aviation managers in determining the locations of MTRs, Aerial Refueling Routes (ARs), etc. The publications include the following:

Flight Information Publications Program

FLIP uses the concept that there are basically three separate phases of flight: planning, en route operations and terminal operations. The FLIP planning document is intended primarily for use in ground planning at military facility base operations offices. It is arranged into four publications: General Planning, Area Planning, SUA, and MTRs (North and South America).

1) **General Planning (GP)**: This publication contains general information on all FLIP publications, terms and abbreviations, explanation of the United States airspace, flight plans and codes, common worldwide pilot procedures, ICAO procedures, operations over the high seas, and aviation weather codes. This book is published every 32 weeks.
2) **Area Planning (AP/1)**: This publication contains planning and procedural information for a specific region or **geographic** area and is published every 24 weeks.
3) **Area Planning AP/1A Special Use Airspace North and South America**: The publication contains **specific** information concerning each area of SUA, including Prohibited Areas (PA), RA, WA, and AA listed by country. MOAs and known parachute jumping areas are also listed. Lateral and vertical boundary descriptions are limited to RAs, WAs, and AAs. MOA data is limited to Scheduling Agency. The AP/1A is updated every 56 days and provides information regarding the Using Agency, Scheduling Activity, Controlling Agency, and their phone numbers.

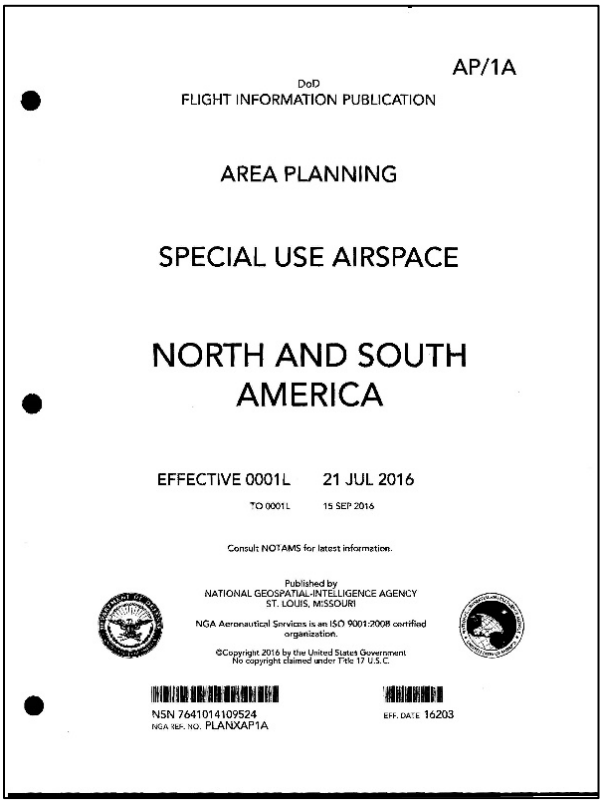


Figure 5-3: AP/1A Cover

4) **Military Area Planning AP/1B MTRs North and South America Charts and Handbooks**: The AP/1B contains information relative to the following:

- IFR Military Training Routes (IR)
- VFR Military Training Routes (VR)
- Slow Routes (SR)
- Refueling Tracks/Anchors/IFR (High Altitude Jet)
- Low-Level Helicopter VFR Aerial Refueling Tracks (AR)
- Avoidance Locations (nuclear power plants)

The AP/1B Handbook provides specific information on each IR, VR, and SR route which includes the width and height of all points along the route, turning points, the assigned scheduling activity, pertinent phone numbers, and any unusual information pertaining to that route.

Scheduling activity phone numbers may be either Defense Switched Network (DSN) or commercial (or both). If a route only lists a DSN number, agency personnel will have to pursue obtaining a commercial number. One suggestion is to call information for the military unit and obtain the local base number. The scheduling activity can usually be reached by switching the last four digits of the commercial information number with the last four digits of the DSN number.

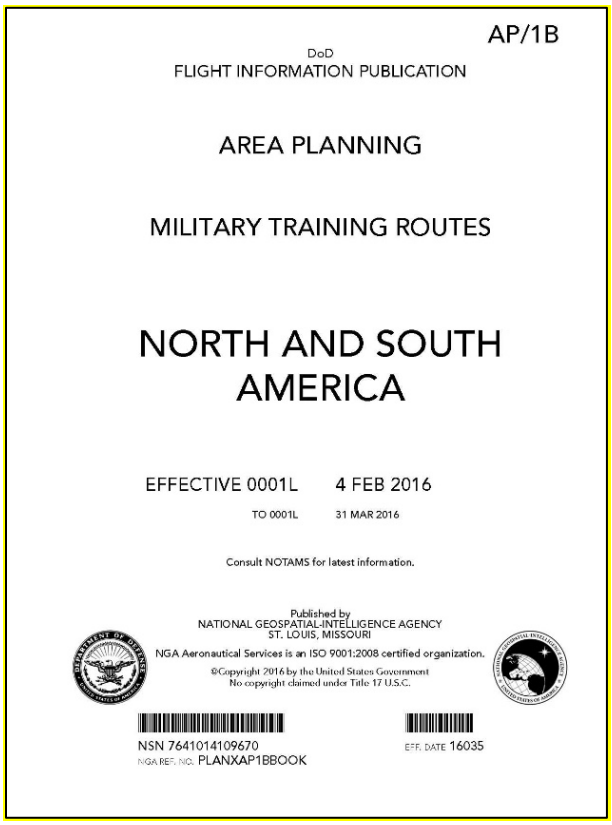


Figure 5-4: AP/1B Cover

In addition to the book, a series of seven charts are issued covering the United States (Alaska, Western, Central, and Eastern).

Agency personnel need to preplan by listing commercial numbers in their mobilization guide or other aviation plan. The AP/1B Handbook is the most complete source of information on MTRs. Due to map scale, not all routes listed in the Handbook appear on the charts.

Each Office with responsibility for scheduling, dispatching, or requesting agency aircraft should maintain a current copy of the AP/1B Chart and Handbook in a location where the aircraft dispatcher or aviation manager has immediate access to it. The book and charts are published every 56 days and can be retrieved by the authorized official utilizing the National Geospatial – Intelligence Agency (NGA) Aeronautical Content Exploitation System (ACES).

- AP/1B Book and Charts.
- DAFIF is a set of files that contain data on airports, NAVAIDS, waypoints, SUA, and other facts relevant to flying. Contents may not be suitable for other uses and may NOT be used for navigation. Consult NOTAMs for latest information.
- DVOF is a database of known vertical obstructions.

Other Publications

Federal Aviation Regulations Publication

Federal Aviation Regulations are Title 14 of the CFRs, and may be listed as 14 CFR, Aeronautics and Space. Agency personnel should be familiar with 14 CFR Part 91, which includes regulations affecting the NAS. Notices of Proposed Rule Making (NPRM) are sent to subscribers when regulatory changes are being considered. The CFRs as well as NPRMs are available online and can be found under FAA regulations at https://www.faa.gov/regulations_policies/faa_regulations/.

Aeronautical Chart Users' Guide

This publication is designed to be used as a learning aid, a reference document, and as an introduction to the wealth of information provided on sectional charts and publications. It includes explanations for both VFR and IFR terminology and symbols. It depicts (in color) all the symbols used throughout various aeronautical charts. Agency personnel will find this to be a valuable educational or reference tool. The Aeronautical Chart User's Guide should be the starting point for understanding FAA Charts. The PDF format guide is available at
https://www.faa.gov/air_traffic/flight_info/aeronav/digital_products/aero_guide/

Aeronautical Information Manual (AIM)

The AIM is designed to provide the aviation community with basic flight and ATC procedures for use in the NAS. Information parallels the U.S. Aeronautical Information Publication (AIP) that is distributed internationally.

The AIM has information such as descriptions of aeronautical lighting and airport visual aids; descriptions of various navigation aids with proper use procedures; procedures for obtaining weather, preflight and in-flight services; arrival, departure, and en route procedures; emergency procedures; and a pilot/controller glossary. The AIM is available at:
https://www.faa.gov/air_traffic/publications/atpubs/aim_html/, or through commercial sources.

Chart Supplements

Chart Supplements (formerly called the Airport/Facility Directory) are a listing of data on record with the FAA on all open-to-the-public airports, seaplane bases, heliports, military facilities, and selected private use airports with a DoD instrument approach procedure. The seven volumes of FAA Chart Supplements are arranged by geographic regions and available at
https://www.faa.gov/air_traffic/flight_info/aeronav/productcatalog/supplementalcharts/airportdirectory/.

Domestic Notices

The Domestic Notices website is an important publication for airspace coordination that contains TFRs and flight information in advance of Major Sporting and Entertainment Events such as the Super Bowl, NASCAR race events, and Special Military Operations to include temporary MOAs.
https://www.faa.gov/air_traffic/publications/domesticnotices/.

This information is updated continuously on an on-demand basis.

Note: Flight Data Center (FDC) NOTAMs for Emergency TFRs are not published on the published on the Domestic Notices website.

Advisory Circulars (AC)

The AC System became effective in 1962. It provides a single, uniform, agency-wide system that the FAA uses to deliver advisory material to FAA customers, aviation industry, and the public. The AC are informative in nature, offering a broad explanation of actual regulations and additional information to assist users of the national airspace in compliance with regulations. AC are numbered to correspond with 14 CFR. Agency personnel will be interested in ACs regarding TFRs, obstacles, and other aviation information. They are available at https://www.faa.gov/regulations_policies/advisory_circulars/.

Technology

"See and avoid" is the basic principle of VFR flight and collision prevention. In the early days of aviation, all airspace was uncontrolled. There were few aircraft, and none had the equipment necessary to fly through clouds. Traffic density was low, and aircraft flew slowly compared to today. It was generally agreed that if aircraft remained clear of clouds and had at least one mile of visibility, then pilots could see other aircraft, obstructions, and terrain in time to avoid a collision.

With the increase in the number of fast aircraft and advanced navigation technologies, systems were developed and continue to evolve to effectively manage today's complex airspace. UAS present an additional challenge for visual observation. Future industry solutions are developing a "sense and avoid" capability in UAS that will provide safe separation from other aircraft. FAA Remote ID for UAS will become effective September 2023.

Required Navigation Performance (RNP)

RNP is RNAV with onboard navigation monitoring and alerting. RNP is also a statement of navigation performance necessary for operation within a defined airspace. A critical component of RNP is the ability of the aircraft navigation system to monitor its achieved navigation performance, and to identify for the pilot whether the operational requirement is or is not being met during an operation. This onboard performance monitoring and alerting capability; therefore, allows a lessened reliance on ATC intervention (via radar monitoring, Automatic Dependent Surveillance–Broadcast [ADS-B], communications), and/or route separation to achieve the overall safety of the operation. RNP capability of the aircraft is a major component in determining the separation criteria to ensure that the overall containment of the operation is met. The RNP capability of an aircraft varies depending upon the aircraft equipment and the navigation infrastructure. For example, an aircraft may be equipped and certified for RNP 1.0 but may not be capable of RNP 1.0 operations due to limited NAVAID coverage.

Global Positioning System (GPS)

GPS is a navigation system consisting of satellites that transmit precise time and position information to anywhere on the globe. The GPS constellation consists of multiple satellites orbiting the earth in six fixed planes. Each satellite orbits the earth twice a day at an altitude of 10,800 NMs. This system is unaffected by weather but may be impacted by sun flares or GPS testing by DoD.

GPS was developed and deployed by the DoD primarily to provide continuous, worldwide positioning and navigation data to U.S. and allied military forces around the globe. GPS has broad civilian and commercial applications including navigation, surveying, exploration, and tracking.

DATUMS: One area of concern for agency personnel is the confusion over which datum to apply when using GPS for positioning reporting. A datum refers to a set of measurements made on the ellipsoid model of the earth measuring horizontal positions on the earth's surface.

In March of 1989, the Council of International Civil Aviation (ICAO) accepted a recommendation from its Special Committee on Future Air Navigation Systems (FANS/4) which adopted WGS 84 (World Geodetic System 1984) as the international standard datum for aviation positioning.

A reference datum (mathematical model) is a known and constant surface which is used to describe the location of unknown points on the earth. Since a reference datum can have different radii and different center points, a specific point on the earth can have substantially different coordinates depending on the datum used to make the measurement. The most common reference datum versions in use throughout North America are NAD27, NAD83, and WGS84.

The North American Datum (https://en.wikipedia.org/wiki/North_American_Datum) of 1927 (NAD 27) is "the horizontal control datum for the United States that was defined by a location and azimuth on the Clarke spheroid of 1866, with origin at (the survey station) Meades Ranch (Kansas)" (https://en.wikipedia.org/wiki/Meades_Ranch_Triangulation_Station). NAD27 is a local referencing system covering North America.

The North American Datum of 1983 (NAD 83) is "the horizontal control datum for the United States, Canada, Mexico, and Central America, based on a geocentric origin and the Geodetic Reference System 1980." "This datum, designated as NAD 83 is based on the adjustment of 250,000 points including 600 satellite Doppler stations which constrain the system to a geocentric origin." NAD83 may be considered a local referencing system.

WGS 84 is the World Geodetic System (https://en.wikipedia.org/wiki/World_Geodetic_System) of 1984. It is the reference frame used by the U.S. DoD at https://en.wikipedia.org/wiki/United_States_Department_of_Defense and is defined by the NGA (formerly the National Imagery and Mapping Agency) (formerly the Defense Mapping Agency). **WGS 84 is used by DoD for all its mapping, charting, surveying, and navigation needs, including its GPS** (https://en.wikipedia.org/wiki/Global_Positioning_System) **broadcast and precise orbits.**

CAUTION: The difference between datums can cause a difference in accuracy of positions. For example, a firefighter in the field might be using the NAD 27 datum while giving positions to a firefighting aircraft that is using the WGS 84 datum.

It is imperative that agency personnel are aware of their agency's datum policy. For example, BLM Aviation uses WGS 84 as a uniform standard. When describing a place by latitude/longitude, the datum should also be stated.

GPS outages are most often caused by localized jamming of the GPS system by the military for realistic combat training in a GPS degraded environment. NOTAMs are available for GPS outages at: https://pilotweb.nas.faa.gov/PilotWeb/noticesAction.do?queryType=ALLGPS&formatType=ICAO.

A sample GPS NOTAM is below.

KZAB ALBUQUERQUE (ARTCC),NM. 07/094 (A0244/16) - NAV (NAFB GPS 16-04) GPS (INCLUDING WAAS, GBAS, AND ADS-B) MAY NOT BE AVBL WI A 223NM RADIUS CENTERED AT 361304N1150307W (LAS 019010) FL400-UNL DECREASING IN AREA WITH A DECREASE IN ALTITUDE DEFINED AS:

176NM RADIUS AT FL250,

110NM RADIUS AT 10000FT,

108NM RADIUS AT 4000FT AGL,

104NM RADIUS AT 50FT AGL.

THIS NOTAM APPLIES TO ALL AIRCRAFT RELYING ON GPS. ADDITIONALLY, DUE TO GPS INTERFERENCE IMPACTS POTENTIALLY AFFECTING EMBRAER PHENOM 300 AIRCRAFT FLIGHT STABILITY CONTROLS, FAA RECOMMENDS EMB PHENOM PILOTS AVOID THE ABOVE TESTING AREA AND CLOSELY MONITOR FLIGHT CONTROL SYSTEMS DUE TO POTENTIAL LOSS OF GPS SIGNAL. 22 JUL 07:30 2016UNTIL 22 JUL 07:59 2016. CREATED: 19 JUL 08:19 2016

Figure 5-5: Sample GPS NOTAM

Automatic Dependent Surveillance–Broadcast (ADS-B)

Automatic Dependent Surveillance–Broadcast (ADS-B) is a precise satellite-based surveillance system by which an aircraft's position can be determined and periodically broadcast via satellite navigation, enabling it to be tracked. The information can be received by ATC ground stations as a replacement for secondary radar. ADS-B will eventually replace the current Identification Friend or Foe (IFF) Systems which consists of a transponder that communicates identification and position information to ATC.

ADS-B has two levels of service known as ADS-B (OUT) and ADS-B (IN). ADS-B (OUT) is position reporting only, and ADS-B (IN) is a more complete service that receives data transmissions to the cockpit from ATC and other aircraft. Both levels of service use GPS technology to determine an aircraft's location, airspeed, and other data, and broadcast that information to a network of ground stations. The data is then relayed to ATC displays and to nearby aircraft equipped to receive it via ADS-B. Operators of aircraft equipped with ADS-B (IN) can receive weather and traffic position information delivered directly to the cockpit.

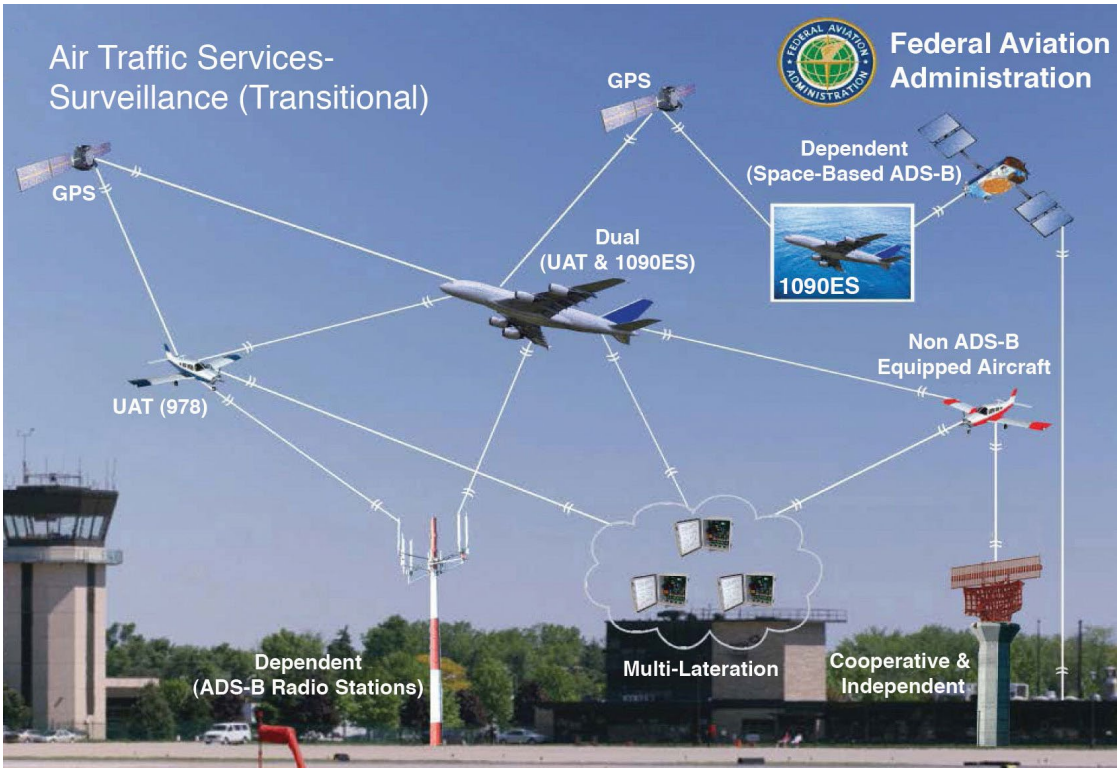


Figure 5-6: ADS-B Overview

ADS-B ground stations are now operational across the nation, broadcasting traffic, weather, and flight information to all appropriately equipped aircraft. ATC facilities are rapidly being updated for ADS-B. Since 2020, all aircraft flying in Class A, B, and C airspace as well as Class E airspace above 10,000 MSL (but not below 2,500' AGL) will be required to have ADS-B compliant avionics that transmit their location data.

ADS-B may provide a limited improvement in situational awareness for firefighting operations. However, it is primarily designed for FAA use in the high-density en route environment. ADS-B provides a broad range of textual/graphical weather products and other flight information to the GA community that includes the status of SUA and TFRs.

Traffic Avoidance Systems (TAS)

1) **Traffic Alert and Collision Avoidance System (TCAS)** is an aircraft collision avoidance system designed to help prevent mid-air collisions between aircraft. It monitors the airspace around an aircraft for other aircraft equipped with a corresponding active transponder (independent of ATC) and warns pilots of the presence of other transponder-equipped aircraft which may present a threat of mid-air collision (MAC). It is an implementation of the Airborne Collision Avoidance System mandated by International Civil Aviation Organization to be fitted to all aircraft with MTOM (maximum takeoff mass) over 5,700 kg (12,586 pounds) or authorized to carry more than 19 passengers. TCAS cockpit systems are frequency compatible with ADS-B and will be able to display more accurate aircraft position information when using ADS-B data.

Figure 5-7: TCAS Display

2) **Terminal Collision Avoidance Device (TCAD)** is a low cost anti-collision system detecting and alerting pilots to nearby IFF transponder-equipped aircraft but not providing evasive instructions or coordination with other aircraft. ADS-B (IN) will provide improved data.

IFF Transponder Codes/Code 1255 (National Firefighter Transponder Code)

Transponders are airborne radar beacon receiver/transmitters that make it possible for ATC to locate and identify aircraft on their radar display. The transponder will generate a reply signal upon proper interrogation. The transponder utilizes one of a combination of the 4,096 possible discrete codes. Four digit code designations ('squawks') are used. Each digit of a squawk varies from 0 to 7 only. (In an octal numeral system, there can never be an 8 or a 9 in a transponder code.)

Transponder Codes: the following is a list of standardized transponder codes:

1200 – VFR code in the U.S.

1255 – National Firefighting Transponder Code used for aerial firefighting

7000 – VFR code commonly used in Europe (refer to ICAO standards)

7500 – Hijack code

7600 – Loss of communication code

7700 – Emergency code

7777 – Military interceptor operations code

In 1997, the FAA designated the transponder code 1255 for national use in aircraft firefighting operations. The purpose of this special code is to enable en route and terminal radar service facilities to identify aircraft engaged in tactical fire suppression missions and, if necessary, separate them from nonparticipating aircraft such as news media and transient aircraft.

The letter designating the code states: “Beginning July 17, 1997, on a national basis, aircraft engaged in, or traveling to, firefighting operations are approved to use a special beacon code, 1255. The code 1255 may be used by aircraft that are not in contact with ATC. Air traffic controllers have been briefed that the code would be equivalent to using the flashing lights and sirens on a fire engine. In other words, aircraft flying on a point-to-point repositioning flight from Montana to Arizona to help fight a fire would **not** use a squawk of 1255. This discreet code is intended to increase controller awareness of the firefighting mission but does not assure priority ATC services. If needed, special services should be requested from ATC. At that time, subject to the controller’s discretion, the 1255 code may be retained or another beacon code may be assigned.”

This transponder code is not intended for use during reconnaissance, ferrying, VIP, transport, or other non-tactical flights. It is not to be used for repositioning aircraft or during cross-country flights. It is specifically for flights that are tactical in nature and are actively involved in wildfire suppression efforts.

Airspace Coordination Skills

When directing pilots to a location, or understanding their location reports, some basic knowledge of aeronautical terminology is needed. To help dispatchers and other non-pilots develop practical skills and understand the common references used by the aviation community, a number of explanations are provided below.

Position, Direction, Heading, and Distance

The term position refers to an identifiable location on earth or a point within a human designed system of artificial coordinates. A position may be in reference to a known geographical landmark, in relation to an Air Traffic Control Navigational Aid (NAVAID) facility, or in reference to lines drawn on a map (latitudes and longitudes).

A compass direction (e.g., east, west) is the position of one point or object in relation to another, without regard to distance. A heading (also known as a bearing) differs from a compass direction in that it describes the angle (in degrees) from the longitudinal axis of an aircraft to a reference line such as magnetic north.

Distance is the spatial separation between two points, without regard to direction. The customary units are nautical or statute miles, or kilometers. A statute mile is 5,280' long. Nautical miles are more commonly used in airspace coordination, such as describing a location in terms of radial and distance from a VOR. **One nautical mile is 6,076' long**. Each minute of latitude on an FAA Aeronautical Sectional Chart is one NM from the next whole minute line.

Compass Headings

Compasses are used to determine headings and directions. The simplest compass references use the cardinal point system of north, east, south, and west. Intermediate points can be described (e.g., northeast, or southwest) or subdivided again for even greater accuracy (e.g., north-northwest). The use of compass points to describe direction is relative to the point of reference.

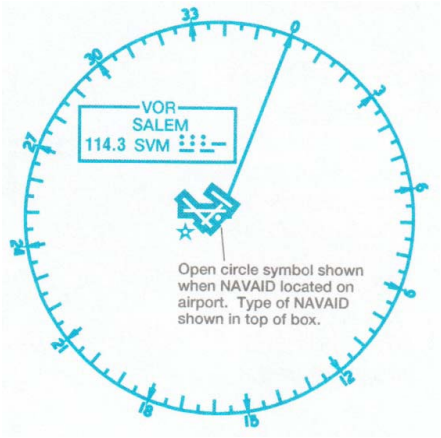


Figure 5-8: Compass Rose Oriented to Magnetic North

When the compass is divided into a 360-degree circle, each of the four major quadrants (e.g., north to east) becomes 90 degrees. Beginning at zero degrees (north), and proceeding clockwise, points are marked at even intervals until north is once again reached. At this point north serves as the ending point of 360 degrees. Using this system, direction can now be stated as a degree (e.g., east is 90 degrees, south is 180 degrees, west is 270 degrees), enabling even greater precision in navigation.

Compass Declination (Magnetic Variation)

When using a compass remember that when the needle points north, it is using the magnetic force of the earth to find the northern magnetized pole, commonly referred to as *magnetic* north. Whereas true north is a map direction toward the geographical North Pole, magnetic north is the compass direction toward the magnetic North Pole somewhere north of Hudson Bay, Canada.

Figure 5-9: Red Bluff VOR

The angle between magnetic north and true north is called the variation or declination. True north and magnetic north coincide along only one line in North America which is continually shifting and is depicted as a magenta dashed isogonic line on aeronautical sectional charts. As of 2018, the current line runs south from the magnetic North Pole to approximately Minneapolis, Minnesota, then extending through central Missouri, to Baton-Rouge, Louisiana, and across the Gulf of Mexico into Central America. The exact location of this zero degree variation line is continuously and slowly shifting in one direction or another as the magnetic fields in the earth's crust shift. At any point between this zero degree isogonic line and the Pacific Ocean, the compass needle points east of true north and is read as "xx degrees east variation" (or declination). At any point between the zero degree isogonic line and the Atlantic Ocean, the needle points west of true north and is read as, "xx degrees west variation."

Consult sectional charts or the Chart Supplement for the magnetic variation for a desired area or NAVAID. Not accounting for the difference between a map's true north and a compass magnetic north can complicate navigation which may throw an aircraft off course.

Air Navigational Aids

Various types of NAVAIDs are used today within the NAS. Omnidirectional NAVAIDs use 360 courses (like the 360 degrees of a compass) which are known as 'radials'; and the number assigned gives the aircraft's relative bearing from the NAVAID facility. The most common NAVAID of this kind is called a Very High Frequency Omnidirectional Range (VOR) which is described in detail below. When dealing with positions based on omnidirectional NAVAID equipment, keep in mind these are limited to line of sight/reception. Additionally, facilities are classified by their power, which affects usable range for reliable navigation. These classifications are terminals (T), low altitude (L), or high altitude (H). When calculating a NAVAID location or fix using charts or computer programs, compare the NAVAID's classification to the calculated distance to determine if this reference is appropriate.

VOR, VOR/DME, and VORTAC operate in the Very High Frequency (VHF) radio band and are the primary omnidirectional facilities used by public and private aircraft.

Each Very High Frequency Omnidirectional Range (VOR) station transmits a signal that is identifiable as 360 radials (or lines) of position that are oriented in relation to magnetic north. A compass rose aligned with magnetic north is placed at each VOR site on sectional charts.

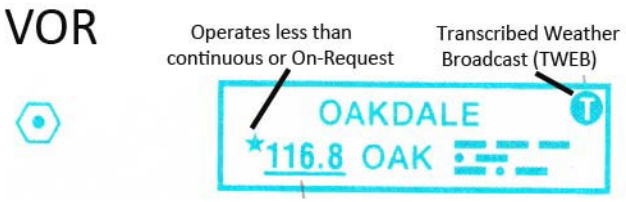


Figure 5-30: VOR Frequency and Capabilities

VOR/DMEs are equipped with a feature that measures distance from the aircraft to the DME. This combined position information is also referred to as radial/DME. For the DME equipment to measure distance from an aircraft, it needs corresponding equipment on board called an interrogator that can communicate with the NAVAID by sending out signals that seek distance information. The ground equipment, called a transponder, accepts the signals, calculates distance based on transmission times and sends back the distance information to the aircraft.

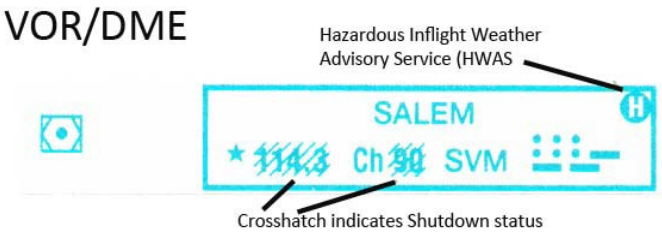


Figure 5-41: VOR with DME Capability

VORTAC facilities broadcast NAVAID information to both VOR equipped aircraft as well as to Ultra High Frequency (UHF) Tactical Air Navigation (TACAN) equipped aircraft, which is primarily the military. The TACAN facility includes distance measuring equipment that provides DME information for aircraft using VORs. The DME feature will be retained as the TACANs are phased out as an en route navigation aid.

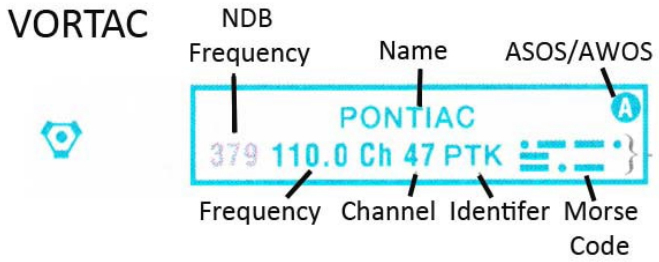


Figure 5-52: VORTAC Combined VOR TACAN

Terminal VHF Omnidirectional Range (TVOR) is an airport terminal VOR. It is a low powered VOR located at or near an airport used as an instrument approach aid. It has limited range. TVORs should **not** be used when plotting or describing a TFR location. The FAA is decommissioning many ground-based navigation systems including VORs as well as some radar sites since all aircraft operating in controlled airspace were required to use satellite-based ADS-B by the year 2020.

Using VOR/DME (Bearing/Distance)

There are 360 degrees of radials represented by a VOR station. The radials are the measured magnetic direction from the station and are depicted with a compass rose on aeronautical navigation charts.

The zero degree radial points directly toward magnetic north. The 90 degree radial is 90 degrees clockwise around the compass rose from magnetic north and points to a direction of magnetic east. Like a compass rose, radials always emanate from the station and not from the aircraft.

VORs can be used for many purposes. The most important purpose for the dispatch organization is to determine a position location relative to the VOR. VOR/DMEs are used in submitting TFRs to the FAA.

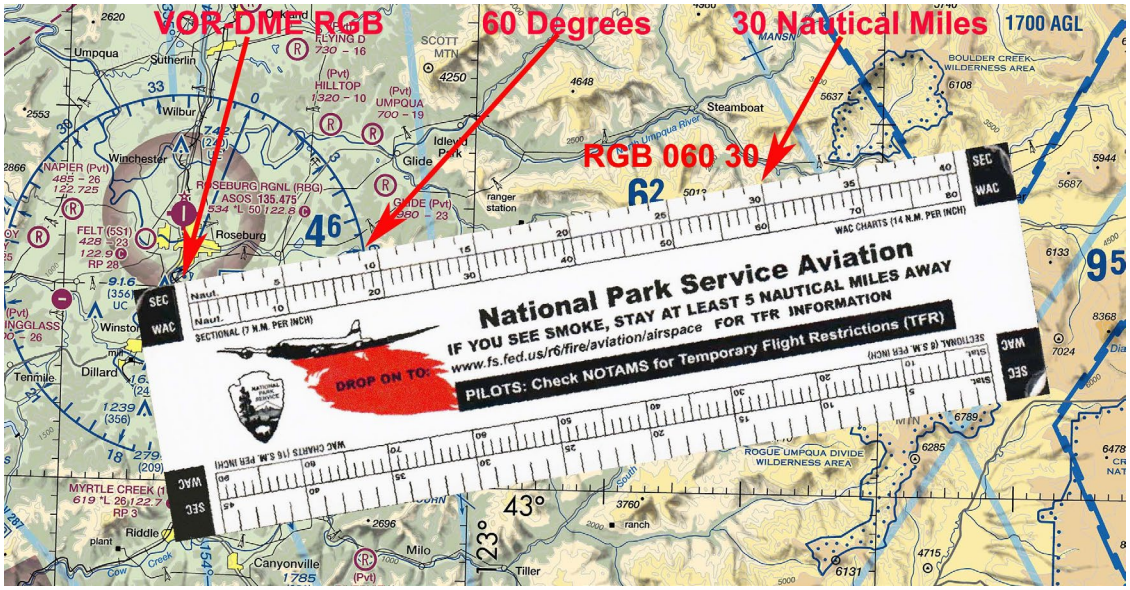


Figure 5-63: Manually Plotting Bearing and Distance

Three steps to plot bearing and distance:

1. Select closest NAVAID.
2. Calculate direction using magnetic north.
3. Plot distance in nautical miles.

Latitudes and Longitudes

Positions are determined in reference to map lines. On a globe there are parallels of latitude (east-west) or meridians of longitude (north-south), represented by the lines which go completely around the world. Related to a map/chart depiction of an area, these lines are simply referred to as latitudes or longitudes. The maps will show these lines as flat and labeled in terms of degrees with subunits expressed in minutes and seconds (or equivalent formats.)

1) Latitude

Latitude lines circle the globe parallel with the equator. Latitude is the angular measurement of a location expressed in degrees north and south of the equator. Latitudes run from zero degrees at the equator to 90 degrees north (N) or 90 degrees south (S) at the respective poles.

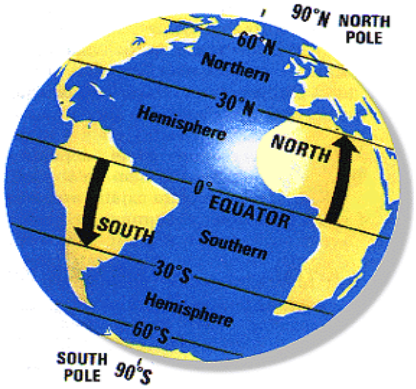


Figure 5-74: Latitude

2) Longitude

Longitude lines run through poles from north to south. Longitude is the angular measurement of a location east or west of the prime meridian. To set a place of reference, the line which passes through Greenwich, England, was selected as the prime or Greenwich meridian. Longitudes run from zero degrees at the prime meridian to 180 degrees east (E) or west (W), halfway around the globe.

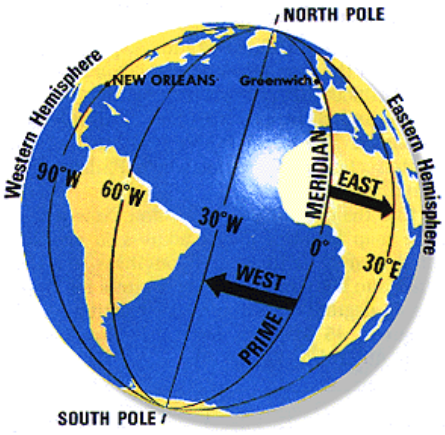


Figure 5-85: Longitude

3) Units of Measure:

Degrees and minutes are units of measurement for latitudes and longitudes. A degree will always be depicted on a map but because of the convergence of lines to the poles, the corresponding mileage/metric value differs. Latitudes are equidistant from each other (also called parallels). One degree of latitude is 60 NM which is equivalent to 69 statute miles or 111 kilometers. Because meridians converge at the poles, the length of a degree can vary from 60 NM or 69 statute miles at the equator to 0 miles at the poles.

To determine a location in smaller than degree units, minutes are used to subdivide each degree into 60 units. Each minute can be further subdivided into 60 units called seconds. When writing a location in terms of latitude and longitude, list the degree 2- or 3-digit number followed by a small circle similar to a footnote character (°), then minutes (2 digits) followed by a single apostrophe (’), and then seconds (2 digits) followed by a quotation mark (”). The latitude value is always listed first, followed by its direction (N or S) from the equator and then the longitude value, followed by its direction (E or W) from Greenwich.

Sometimes a different description using a decimal fraction of a value is used. When using this method, remember that each tenth of a value (degrees, minutes, or seconds) should be multiplied times six to get the value at the next lower subunit.

a. Degrees, Minutes, Seconds: 40°58’17”N, 117°44’06”W

b. Decimal, Degrees: 40°.971389N, 117°.735000W

c. Decimal, Minutes: 40° 58.28N, 117° 44.10W

In the above example to convert the decimal minutes to minutes seconds, multiply the decimal minute of latitude (.28) by 60 to get approximately 17 for 40°58'17"N. For the longitude, multiply (.10) by 60 = 6 for 117°44'06"W. An easier method is to carefully use one of the many latitude and longitude conversion tools online such as the one found at the Federal Communications Commission (FCC) website: https://www.fcc.gov/media/radio/dms-decimal.

The U.S. NOTAM Office will only accept TFR requests in a Degrees, Minutes, Seconds format that includes a reference to North latitude (N) and West longitude (W). If seconds are not available, add two zeros for the second spaces. Do not include spaces, commas, dashes, or any other symbols. The standardized format "ddmmssN/dddmmssW." The first set of Lat. Long. Coordinates used in the example above would therefore be written as 405817N/1174406W.

Six Steps to Plotting Latitude and Longitude

1. Look at a map and identify the latitude lines then look for labeled values. Remember, moving north from the equator the numbers will get larger. The opposite would be true when south of the equator, the numbers increase southbound there.
2. Next find a line that runs perpendicular through the latitude line, this is the longitude line. Looking north on the map, find hash marks along the longitude line, dividing the area to the next crossing (not labeled) latitude line into three groups of ten, making up 30 minutes. Each hash mark above the latitude will be distinct and the hash marks between the units of ten will be smaller. Within each ten hash marks, the midpoint (at 5') will stick out a little further to make it easier to read. This makes it easier to read the value at a glance versus counting up each of the hash marks from the latitude line. Be careful to not get confused counting in reference from the midpoint (30') between lines of latitude.
3. Most aviation maps will depict the degrees and minutes values but not the seconds. It really depends on the scale.
4. After plotting the latitude, keep the reference, and then look for the longitude. A simple way is to use a straightedge or use a sheet of paper with a clean, straight end to follow along that point or else pencil a faint line.
5. Do the same steps 1–3, only this time for the longitude. The values will increase moving westbound and decrease moving eastbound from Greenwich in the western hemisphere. Find the degrees by marked references and then use the hash marks along the closest latitude line to count minutes. Identify where the north-south line runs into the line of latitude and that's the location point.
6. With a known location, plotting the latitude and longitude (also called coordinates), is a similar process. Find the closest labeled reference line and work from there. It may be harder to read the lines on busy map backgrounds. Note the final position with latitude first followed by direction from equator (U.S. will always be N) and the latitude followed by direction from Greenwich, England (U.S. will always be W).

Figure 5-96: Steps to Plotting Latitude and Longitude

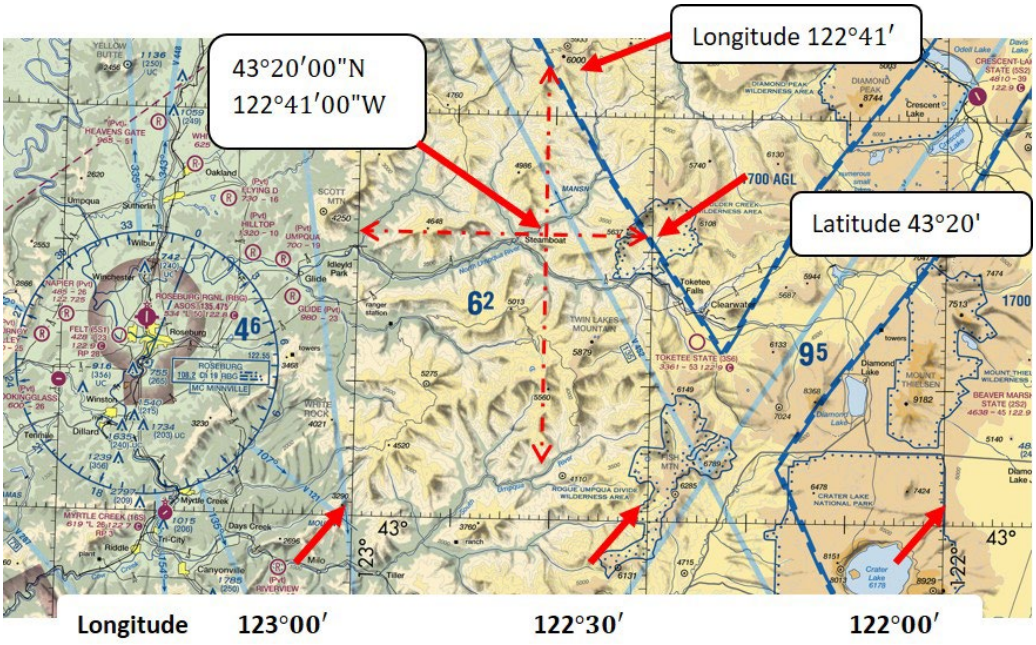


Figure 5-107: Understanding Latitudes and Longitudes

Coordinated Universal Time or Zulu Time

In communicating with DoD or FAA agencies, reference may be made to Coordinated Universal Time (UTC), or Zulu time, formerly referred to as Greenwich Mean Time (GMT). By international agreement, the term UTC is recommended in NOTAMs. The term Zulu is still in use in hourly aviation weather reports such as ASOS, AWOS, ATIS, and METARs.

The world is divided into 24 time zones as shown in Figure 5-19 below. Greenwich, England, was selected as the prime meridian or the standardized point of reference to be used throughout the world for calculating time. From this point of reference, the earth is divided into 24 bands or time zones, located about 15 degrees apart. Each band represents a one hour difference from the zero meridian at Greenwich. To convert Zulu to local time, one would subtract an hour for each band when moving to the west and add when moving to the east. When transitioning to daylight savings time, the conversion requires one additional hour. The following is a handy table for converting local 24-hour clock time to Zulu time in most of the 48 contiguous states of the U.S.

Table 5-2: UTC Time Zones

Time Zone	Standard Time (Fall to Spring)	Daylight Savings Time (Spring through Fall)
Eastern Time Zone	Local time + **5** hrs. = UTC	Local time + **4** hrs. = UTC
Central Time Zone	Local time + **6** hrs. = UTC	Local time + **5** hrs. = UTC
Mountain Time Zone	Local time + **7** hrs. = UTC	Local time + **6** hrs. = UTC
Pacific Time Zone	Local time + **8** hrs. = UTC	Local time + **7** hrs. = UTC

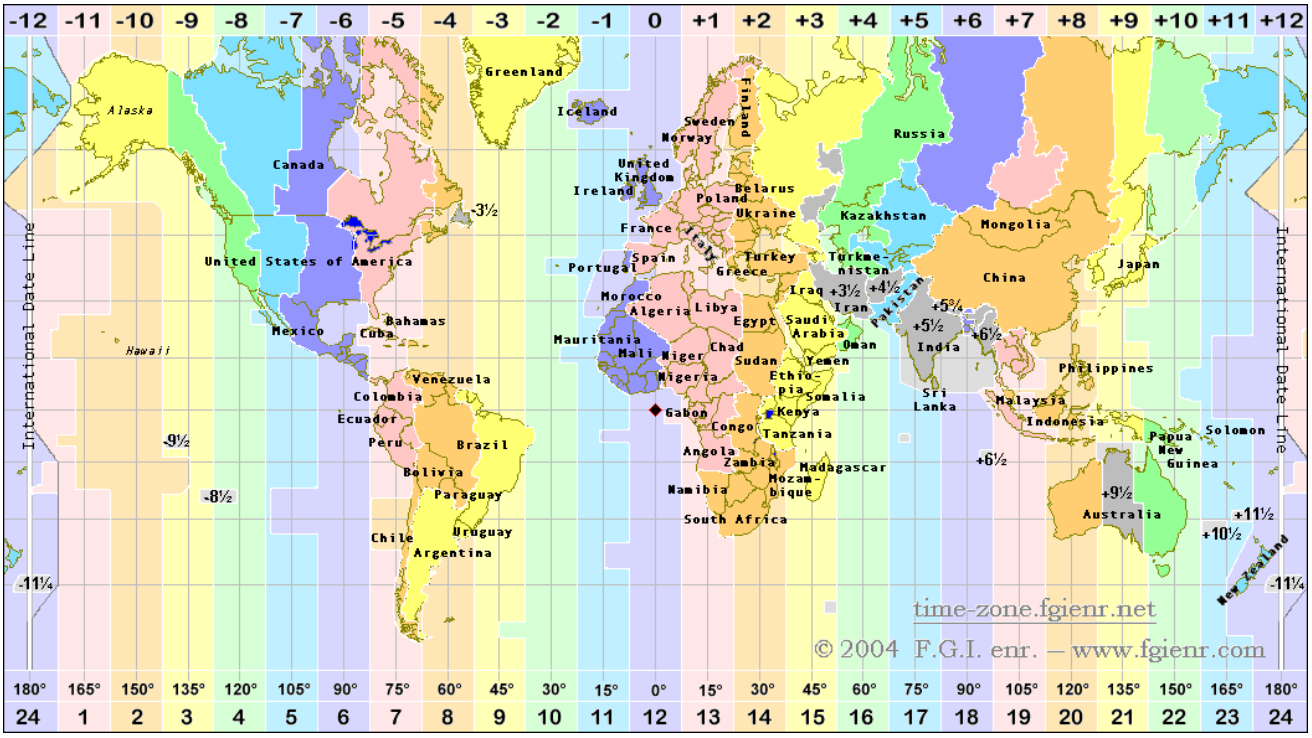


Figure 5-118: UTC Time Zones

The ATC system and both civilian and military pilots worldwide use this standard to calculate actual flight time when crossing time zones. When working with flight operations, especially in areas where the time zone changes, agency personnel should become accustomed to using Zulu or UTC time as a reference. A conversion chart is located at https://www.ready.noaa.gov/READYtime.php.

Agency personnel working with military schedulers should communicate in the UTC time frame. It is helpful to have a separate clock in your office set to UTC time. When not using UTC, add the word "local" after time designations.

Automated Flight Following

AFF is an agency system that automatically tracks **specially-equipped** aviation assets in a 2D environment. It provides altitude, course, and speed information in near-real-time to dispatchers, aviation managers, and other authorized users. The equipment includes geolocation and data communications devices that use satellite-based technology.

AFF does not track resources without this specialized equipment. The data transmitted via satellite is displayed through a web-based application. A username and password are required to access the tracker application which provides a map-based view of the latest reported geographic location and other attributes of mobile resources.

Below is a sample of AFF with a TFR, air attack, lead plane, four airtankers, and eight helicopters. By placing the cursor on an aircraft and using the left mouse button; click and then the data block for that aircraft will appear. The pink "I" information icon will display TFR Data when clicked.

Figure 5-19: How Does AFF Work?

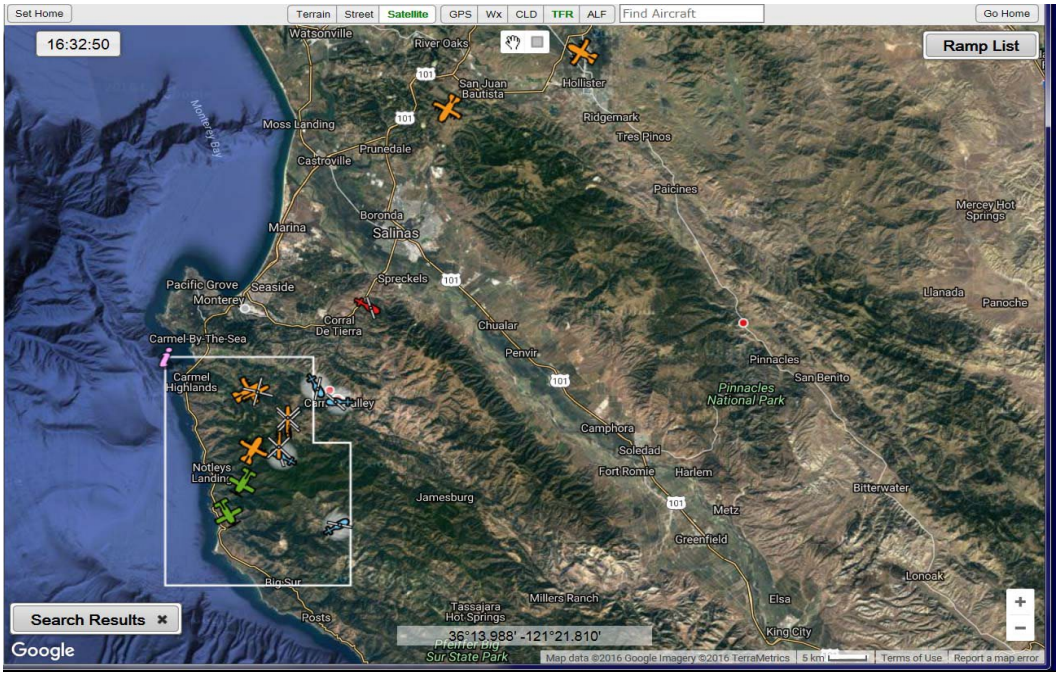


Figure 5-20: AFF Display

FAA Scheduling and Management Tools

Military Airspace Data Entry Tool

After a series of 51 near mid-air collisions reported from 1986 to 1994, efforts have been in process to improve DoD's SUA Scheduling process. Military Airspace Data Entry System (MADE) facilitates an efficient scheduling of airspace with a common input at DoD unit level. This information is then transmitted to the FAA's Special Use Airspace Management System (SAMS). SAMS displays and records SUA and other types of airspace area transactions tracked in the NAS. MADE enables the DoD to safely and efficiently schedule use of SUA, ATCAA, and MTRs.

FAA Special Use Airspace and Air Traffic Control Assigned Airspace (ATCAA)

Information may be found at https://sua.faa.gov/sua/siteFrame.app.

Additional Airspace Coordination Tools

Instructions for plotting polygon TFRs on SkyVector, for plotting circular TFRs on Google Earth Pro, and for using the airspace applications in EGP are available from a qualified Airspace Coordinator or the USFS/DOI National Airspace Program Manager.

Chapter 6 – Temporary Flight Restrictions (TFRs), FDC NOTAMs, and Advisory NOTAM (D)

Introduction

In order to enhance safety during an incident or project, the FAA may be requested to issue a NOTAM to pilots; these could be either am FDC NOTAM or an Advisory NOTAM (D). In addition to the NOTAM process, agency personnel contact military facilities and or other agency aviation units to request deconfliction of the involved airspace. Deconfliction processes are described in greater detail in Chapter 7.

Merriam Webster defines "deconflict" as – "to coordinate (something, such as flights, maneuvers, or the use of a location) between groups especially in areas where overlapping operations are occurring in order to reduce the risk of accidents or incidents" For our purposes, it is the act of reducing risk by sharing information regarding flight activity.

Deconfliction is a process that involves the separation of land management agency aircraft from other aircraft that may pose a flight hazard. This process is negotiable and frequently used by local dispatch to inform military units of an agency's planned or emergency flight activity.

Deconfliction information is also used to notify other agency aircraft of an evolving situation that requires enhanced situational awareness so that communication and separation are maintained. See Chapter 7 for additional airspace deconfliction information.

Notices to Air Missions (NOTAMs)

NOTAMs are one of the FAA's methods of distributing information to pilots about changes that are not reflected on current published charts and airport directories. They may contain information about changes or the implementation of a change in any component of the NAS that affects a facility, service, procedure, or introduces a hazard. NOTAMs may be regulatory (restrictive) or advisory (informational) in nature.

The NOTAM Originator is responsible for:

- Validating that any NOTAM that is coming to its end of validity time can auto-expire.
- ICAO contractions must be used.
- If an ICAO contraction is not available, plain text is required. (Example USFS is not an available ICAO contraction, therefore United States Forest Service must be used, BLM is not an available ICAO contraction, therefore Bureau of Land Management must be used.)

NOTAM information is classified into five categories:

- NOTAM (D) or Distant NOTAMs, which are advisory
- FDC NOTAMs, such as TFRs, which are regulatory
- Pointer NOTAMs
- Special Activity Airspace NOTAMs
- Military NOTAMs

1) NOTAM (D)

a) In January 2008, the FAA adopted a new format for NOTAM (D)s and eliminated the NOTAM (L) to provide a single source for NOTAMS. The NOTAM format used by the FAA meets established ICAO criteria. NOTAM (D) information is advisory, and not restrictive in nature. It contains information such as airport closures, runway restrictions, taxiway closures, personnel, and equipment near or crossing runways and navigational aid outages. They are disseminated to all navigational facilities within the NAS, and all public use airports, seaplane bases, and heliports listed in the FAA Chart Supplements.

In some cases, a NOTAM (D) may be appropriate to notify nonparticipating general aviation, commercial or military aircraft of an agency aviation project or activity such as a prescribed fire aerial ignition, blasting, practice parachute jumping, helibases located outside a TFR, or operations at an agency owned airstrip that do not require closure.

b) NOTAM (D) Key Words:

All NOTAM (D) must have one of the FAA's designated key words as the first part of the text after the location identifier. Common keywords include the following:

AIRPORTS
AD – Aerodrome: An "Aerodrome" is a title used in the NOTAM for an Airport. It addresses any hazard to aircraft operations on or within 5 SM of any airport, heliport, helipad or maneuvering area, including the condition of runways, taxiways, ramps, aprons, obstructions, NAVAIDs, services, communications, or airspace.

Aerodrome Examples:
!RIU 088 AD Heli DCMSND
!A00 29D AD CLSD EXC PPR 0330-1430 Mon-Fri
!LAL LAL AD GRASS LDG STRIP LCTD 400 S RWY 9R/27L 1700 X 55 AVBL VMC DALGT PPR SUN N FUN WEF 0804151100-0804232359

APRON
The apron or ramp is a defined part of a land aerodrome that is intended to accommodate aircraft for the purpose of loading or unloading passengers, mail, cargo, and fuel or for parking or maintenance. The NOTAM (D) format will use the keywords APRON or RAM for any hazard associated with airport ground operations. Although "apron" and "ramp" are synonymous, some locations are specifically described as one of these two separate keywords.

Apron Examples:
!ATL APRON NORTH TWY L3 NORTH APRON CLSD
!MEM MEM RAMP FEDEX FEEDER RAMP P ½ IN LOOSE SN FEDEX FEEDER RAMP

RWY – Runway
Runway applies to takeoff and landing surfaces, as well as to their associated lighting and signage.

Runway RWY Examples:
! STL STL RWY 12L/30R CLSD EXC TXG

!LEX LEX RWY 5 REIL OTS
!MIV MIV RWY 10/28 CLSD WEF 0807021200-0807021600

TWY – Taxiway
This keyword is used to address conditions pertaining to single or multiple taxiways. A NOTAM (D) using the TWY keyword will identify each taxiway by letter or letter/number as assigned, separated by commas, or may specify "all." If not identified, a TWY may describe the area adjacent to a runway.

Taxiway TWY Examples:
!DSM DSM TWY P1, P3 CLSD
!RDU RDU TWY A CLSD BTWN A1, A2 TIL 0807011600

COM – Communication
The COM keyword applies to a NOTAM (D) with regards to the commissioning, decommissioning, outage, unavailability, or status of an ATC frequency at a communications outlet.

Communications (COM) Examples:
!IPT IPT COM VOR VOICE OTS
!ENA ENA COM LAA 123.6 OTS

NAV – NAVAID
The NAV keyword is used to report the status of navigation aids such as a VOR, ILS, GPS, WAAS, NDB, TACAN, MLS, etc.

NAVAID (NAV) Examples:
!PNC PER NAV VOR UNUSBL 045-060 BYD 20 BLW 2000
!LEX LEX NAV RWY 5 ILS OTS
!PNC PER NAV VOR UNUSBL 045-060 BYD 20 BLW 2000

SVC – Services
The SVC keyword is used to provide information on the status of facilities and services other than communications or navigation outlets. Examples include fuel availability, or service hours for a part-time control tower.

Services SVC Examples:
!MIV MIV SVC FUEL UNAVBL TIL 0809301600
!SHD SHD SVC TWR 1215-0300 MN-FRI/1430-2300

AIRSPACE
Any hazard associated with SUA, Central Altitude Reservation Function (CARF), aircraft operations, aerial refueling, uncrewed rockets, balloons, fireworks, and parachute jumping or skydiving, will be coded with the AIRSPACE keyword.

Airspace Example:
!BKW BKW AIRSPACE PYROTECJNIC DEMO 1000/BLW 8 W.5 NMR AVOIDANCE ADZD WEF 0812312230-0812312300

OBST – Obstructions
The OBST keyword applies to such hazards as moored balloons, kites, towers, cranes, stacks, etc. This keyword also covers outages of obstruction lighting within a 4.3 NM radius of an airport, or outages outside a 5 NM radius on an obstacle that is taller than 200' AGL.

Obstruction (OBST) Examples:
!MIV N52 OBST TOWER 580 (305 AGL) 7 SW LGTS OTS (ASR NUMBER) TIL 0812302300
!PIE CLW OBST CRANE 195 (125 AGL).25 NE (2755N0824W) TIL 0811032000
Note: Latitude/longitude of the obstruction, if known, is inserted immediately after the cardinal direction in the format shown above.

c) Ordering Procedures for a NOTAM (D)

Currently, there are two methods to request a NOTAM D.

i) Calling the FSS

The dispatcher or aviation manager should contact the FSS by calling 1-800-WXBRIEF (1-800-992-7433) and ask to submit a verbal request for a NOTAM (D). This may be documented on a resource order so it can be released in a timely manner. Make sure the person you are talking with understands that this is a request for a NOTAM (D) and NOT a TFR. If they are confused, ask to speak to a supervisor.

- The FSS will issue a NOTAM (D).
- When appropriate, share the NOTAM (D) with impacted military units.
- Modifications and cancellations of the NOTAM (D) will require coordination with the affected FSS and military units. When changes are approved, FSS will issue a corrected NOTAM (D).
- Cancel the NOTAM (D) by contacting the FSS. Document and closeout agency paperwork as appropriate.

2) FDC NOTAM

FDC NOTAM information is regulatory and is often restrictive. TFRs are one of several types of FDC NOTAM. On those occasions when it becomes necessary to disseminate regulatory information, the NFDC in Washington, D.C. will issue FDC NOTAMs. These are legal regulations but may also contain information such as amendments to published Instrument Approach Procedures (IAPs), sectional charts, and the NAS. The U.S. NOTAM Office transmits them to the appropriate FSS and ARTCCs. Note that the FDC NOTAM may be a TFR for a natural disaster, or a large-scale public event that may generate a congestion of air traffic over a site. The FDC NOTAM may be published in the FAA's NOTAM book in advance or published through the NOTAM system.
FDC NOTAM originators must be familiar with NOTAM language and formatting and must use NOTAM nomenclature and abbreviations from (JO 7930.2) and (JO 73.40.2). NOTAM originators are responsible for validating that any NOTAM that is coming to its end of validity can auto-expire, ICAO contractions must be used, when ICAO contraction is not available, plain text is required.

NOTAM originators should also remember that restrictions are to be kept to the minimum area and duration necessary to address the specific situations and have an obligation to mitigate adverse impacts of the NAS.

Originators of TFRs have the responsibility to ensure TFR requests are appropriately scaled, operationally aligned, and considers the legitimate need to establish a 91.137(a)(2) restriction. Once issued, there is an obligation to monitor and evaluate to ensure the airspace restricted is consistent with achieving overall incident hazard relief objectives or subsequent response and recover objectives and should see opportunities to return all or portions of the TFR to the NAS as safety permits. Land Management agencies must commit to addressing unnecessary impacts to the NAS.

NOTAM originators must issue a duplicate TFR for all ARTCCs affected by the TFR in accordance with FAA JO 7930.2. Under this policy, it is possible for one incident to require more than one TFR associated with the same incident. In plain language, if the TFR affects more than one ARTCC, a separate TFR is required for each affected ARTCC. Dispatchers will need to issue a separate A# for each separate TFR.

3) Pointer NOTAMs

Issued by FSS to highlight or point out another published NOTAM, such as another NOTAM (D) or a FDC NOTAM. All pointer NOTAMS will include the keyword appropriate to the condition or event in the reference NOTAM. This type of NOTAM will assist users in cross-referencing valuable information that may not be found under an airport or NAVAID identifier. For example, a FSS might issue a pointer NOTAM for a TFR in its area. The purpose of a pointer NOTAM is to make pilots aware of the existence of a condition or event that might require a lengthy description and point to the location of more detailed information. This practice is intended to help reduce the volume of NOTAM information provided in a standard briefing.

Pointer NOTAM Example:
!CPR CPR AIRSPACE SEE DDY 12/045 PJE WEF 0812141400-0812141830

In this example, the affected location is Natrona County Airport (CPR) in Casper, Wyoming. The keyword indicates that the reported condition or event is related to airspace, and that it is in effect from 1400Z on February 14, 2008, until 1830Z on February 14, 2008. The text (body) section of the D NOTAM points to a published NOTAM, 12/045, which pertains to a parachute jumping exercise (PJE).

4) SAA (Special Activity Airspace) NOTAM

These NOTAMs are issued when Special Activity Airspace (SUA such as RAs, MOAs, etc.) will be active outside the published scheduled times and when required by the published schedule.

5) Military NOTAMs

NOTAMs pertaining to U.S. Air Force, Army, Marine, and Navy navigational aids/airports in the NAS.

Domestic Notices

Notices will be published on-demand as they are submitted with an allotted 10 days for processing. Domestic Notices for special events may be published up to 60 days prior to the event. Typically, the only TFRs that appear on the Domestic Notices website are those issued for sporting, entertainment, or other events when the time and location are known well in advance. Another example would be for DoD Military exercise NOTAMs which often result in the establishment of a temporary MOA or RA. The Domestic Notices are updated continuously on an on-demand basis. Once published, this information is not provided during pilot weather briefings unless specifically requested by the pilot.

GPS "NOTAMS"

The FAA has an advisory system to provide GPS outage information to civilian pilots. GPS outage information is disseminated to civilian pilots via the Automated FSSs (AFSS). Although these outages are not officially NOTAMs, they are available to pilots upon request. They are available on the internet at https://pilotweb.nas.faa.gov/PilotWeb/.

Nine Types of Temporary Flight Restrictions

A TFR is a tool used by the FAA to restrict aircraft operations within a designated area. The TFR applies to an area of airspace (defined both laterally and vertically) that has been temporarily or partially closed to non-participatory aircraft for a specified period. Flight restrictions may be requested in response to the aviation safety need for separation of aircraft for disaster or incident activities.

According to the FAA: "A TFR is a regulatory action issued via the U.S. NOTAM system to restrict certain aircraft from operating within a defined area on a temporary basis, to protect persons, or property in the air or on the ground."

This chapter describes the types of conditions under which the FAA may impose TFRs. It also explains the FAA authority to issue a TFR NOTAM and lists the types of responsible agencies/offices from which the FAA will accept requests to establish TFRs.

The 14 CFR is explicit as to what operations are prohibited, restricted, or allowed in a TFRs area. Pilots are responsible to comply with 14 CFR sections 91.137, 91.138, 91.141, 91.143, 91.144, 91.145 and 99.7 when conducting a flight in an area where a TFR is in effect and should check appropriate NOTAMs during flight planning.

There are nine kinds of TFRs. There are three types of situations where TFRs are issued under 14 CFR 91.137 sub-paragraphs (a)(1), (a)(2) and (a)(3). The rest are issued under 14 CFR 91.138, 91.141, 91.143, 91.144, 91.145 and 99.7. The type of flight restrictions established varies according to the need.

Temporary Flight Restrictions Issued Under CFR 91.137 in the Vicinity of Disaster/Hazard Areas

The three types of TFRs within 91.137 address disaster/hazard situations and restrict flight operations within specified airspace on a temporary basis to provide protection of persons or property in the air or on the ground. Examples include but are not limited to: toxic gas leaks or spills; fumes from flammable agents which, if fanned by rotor or propeller wash, could endanger persons or property on the surface or in other aircraft; volcanic eruptions that could endanger airborne aircraft and occupants; aircraft accident/incident sites; aviation or ground resources engaged in wildfire suppression; or aircraft relief activities following a disaster.

A TFR may be requested by various entities, including military commands; regional directors of the Office of Emergency Planning; Civil Defense State Directors; civil authorities directing or coordinating air operations associated with disaster relief; civil authorities directing or coordinating organized relief air operations (including representatives of the Office of Emergency Planning, land management agencies and state aeronautical agencies); and law enforcement agencies.

1) 14 CFR 91.137(a)(1) TFR in the Vicinity of Disaster/Hazard Areas

   Restrictions issued under this section prohibit all aircraft from operating in the designated area UNLESS the aircraft is participating in the disaster/hazard relief activities and is operated under the direction of the official in charge of on-scene emergency response activities.

   The intent of TFRs issued under this paragraph is to protect persons and property on the surface or in the air from a hazard associated with an incident on the surface. This is the most restrictive

of TFRs and is rarely issued for wildland fire incidents. It is more commonly used for the following:

- Toxic gas leaks, spills, or fumes from flammable agents
- Volcanic eruptions
- Nuclear accidents or incidents
- Hijacking incidents
- Aircraft accident sites (at the discretion of the FAA)

91.137(a) (1) TFRs may be recommended or requested by military major command headquarters, regional directors of the Office of Emergency Planning, Civil Defense State Directors, State Governors, or other similar authority.

Example of a 91.137 (a) 1 TFR (NOT FOR NAVIGATIONAL PURPOSES)
FDC 6/4339 ZHN HI..AIRSPACE KILAUEA, HAWAII..TEMPORARY FLIGHT RESTRICTIONS WI AN AREA DEFINED AS 3 NM RADIUS OF 192420N1551726W (HILO VORTAC ITO209024.6) SFC-5000FT AGL VOLCANIC ACTIVITY. PURSUANT TO 14 CFR SECTION 91.137(A)(1) TEMPORARY FLIGHT RESTRICTIONS ARE IN EFFECT. ONLY RELIEF AIRCRAFT OPERATIONS UNDER DIRECTION OF NATIONAL PARKS SERVICE ARE AUTHORIZED IN THE AIRSPACE. NATIONAL PARKS SERVICE TELEPHONE 808-985-xxxx IS IN CHARGE OF ON-SCENE EMERGENCY RESPONSE ACTIVITY. HONOLULU /ZHN/ ARTCC TELEPHONE 808-840-xxxx IS THE FAA COORDINATION FACILITY. 1611292300-1711022359

2) 14 CFR 91.137 (a)(2)

   Because this type of TFR is the one most commonly requested by land management agencies, (i.e., for wildfires), several additional sections below have been dedicated to describing this type of TFR and the procedures for ordering one.

3) 14 CFR 91.137(a)(3)

   The intent of TFRs issued under this section is to prevent unsafe congestion of sightseeing aircraft above an incident or event that generates a high degree of public interest. This TFR applies only to incident/events that are associated with a disaster or hazard situation. In recent years, this kind of TFR has been issued for the aftermath of a hurricane, tornado, or earthquake after the initial disaster response was issued under 91.137 (a)(2).

   A TFR under the conditions of 91.137 (a)(3) will be issued by the direction of the Regional Air Traffic Division Manager having oversight of the airspace concerned.

   Per 91.137 (d), under this type of TFR, entry for nonparticipating aircraft is similar to 91.137 (a) (2). Participating aircraft may be carrying incident, event, or law enforcement officials. The following aircraft may be allowed to enter a 91.137 (a)(2) TFR under these circumstances:

   a) Airport traffic

      An airport is not closed by a TFR. Operations are allowed if they are conducted directly to or from an airport within the area, if VFR flight above or around the area is impractical due to weather or terrain conditions, and if the flight is not conducted for the purpose of observing the incident or event.

b) IFR traffic

Aircraft operating under an ATC approved IFR flight plan are allowed.

c) Incident**,** event, or law enforcement

Aircraft are allowed if they are carrying incident, event, or law enforcement personnel. Note that no parameters are set requiring prior notification.

d) Media

Media are allowed if the aircraft is carrying properly accredited news representatives and a flight plan is filed with the appropriate FSS or ATC facility specified in the NOTAM prior to entering the area.

4) 14 CFR 91.138 TFR in National Disaster Areas in the State of Hawaii

The intent of TFRs issued under this section is, for humanitarian reasons, to protect persons or property on the surface within declared national disaster areas in the State of Hawaii. The TFR addresses a determination that an inhabited area within a declared national disaster area in the State of Hawaii needs protection for humanitarian purposes. This regulation was adopted because of the Aviation Safety and Capacity Act of 1990 which provided (in part) that the FAA would adopt regulations that would be similar to those in 91.137 that would apply specifically to a declared national disaster in Hawaii. This TFR may be requested based on humanitarian reasons. A 91.138 NOTAM would be effective for 90 days or until the natural disaster designation is terminated, whichever comes first. The Governor of the State of Hawaii or the Governor's designee may request the TFR.

Aircraft exemptions allowed to fly within a 91.138 TFR are similar to 91.137 (a) 2 and 91.137 (a) 3 with some differences. For disaster response aircraft, authorization is obtained from the official in charge of associated emergency or disaster relief response activities, and the aircraft is operated under the conditions of that authorization. Additional exemptions are the following:

- Aircraft is carrying law enforcement officials.
- Aircraft is carrying persons involved in an emergency or a legitimate scientific purpose.
- Aircraft is operating in accordance with an ATC clearance or instruction.
- Aircraft is carrying properly accredited newspersons, and before entering the area, a flight plan is filed with the appropriate FAA or ATC facility specified in the NOTAM, and the operations is conducted in compliance with the conditions and restrictions established by the official in charge of on-scene emergency response activities; and
- The aircraft is operating in accordance with an ATC clearance or instruction.

5) 14 CFR 91.141 Flight Restrictions in the Proximity of the President and Other Parties

The intent of TFRs issued under this section is to protect the President, Vice President, or other public figures. It is sometimes put into effect during Presidential or other public figure's appearance at large wildland fires.

Considerable coordination is required if fire suppression aviation activity is to continue during the visit. Consult the National Airspace Program Manager for specific airspace roles and responsibilities to be implemented during a Presidential visit.

Order an ASCO to assist with the coordination early in the process to ease the way for the White House Movement Team and the Secret Service. Do not attempt to fly within a 91.141 TFR unless there is written documentation and a plan in place that the flight is authorized. Early planning and coordination will facilitate flight(s) during the visit.

No person may operate an aircraft over or in the vicinity of any area to be visited or traveled to by the President, the Vice President or other public figures contrary to the restrictions established by the FAA Administrator and published in the TFR.

The Presidential TFR is usually a combination of two circles, one being 30 NM radius and one being 10 NM radius. The Vice Presidential TFR is usually 3 NM radius. When the President has a residence that has a pre-established PA associated with the airspace, there may be an additional 91.141 TFR and restrictions issued when the residence is occupied by the President. PA P-40 (Camp David) frequently has an additional 91.141 TFR issued during Presidential visits.

The 91.141 TFRs are usually lengthy, extensive, and complicated. If emergency response flights are being planned during a Presidential visit, be sure to adhere to all restrictions imposed by the TFR.

Example of a 91.141 TFR (NOT FOR NAVIGATIONAL PURPOSES)
FDC 9/2934 ZFW TX.. FLIGHT RESTRICTION. DALLAS, TEXAS. PURSUANT TO 49 USC 40103(B), THE FEDERAL AVIATION ADMINISTRATION (FAA) CLASSIFIES THE AIRSPACE DEFINED IN THIS NOTAM AS 'NATIONAL DEFENSE AIRSPACE'. ANY PERSON WHO KNOWINGLY OR WILLFULLY VIOLATES THE RULES CONCERNING OPERATIONS IN THIS AIRSPACE MAY BE SUBJECT TO CERTAIN CRIMINAL PENALTIES UNDER 49 USC 46307. PILOTS WHO DO NOT ADHERE TO THE FOLLOWING PROCEDURES MAY BE INTERCEPTED, DETAINED, AND INTERVIEWED BY LAW ENFORCEMENT/SECURITY PERSONNEL. PURSUANT TO TITLE 14, SECTION 91.141 OF THE CODE OF FEDERAL REGULATIONS, AIRCRAFT FLIGHT OPERATIONS ARE PROHIBITED WITHIN THE FOLLOWING AREA(S) UNLESS OTHERWISE AUTHORIZED BY ATC WITHIN A 1 NMR OF 325321N/0964835W OR THE CVE085004.8 UP TO AND INCLUDING 1500 FT AGL EFFECTIVE IMMEDIATELY UNTIL FURTHER NOTICE.

Figure 6-1: VIP over Reno, NV

Figure 6-2: Presidential TFR 91.141
Figure is During Initial Attack Fire Activity with A Fire TFR Embedded within the SE Edge of the 30 NM Outer Ring

6) 14 CFR 91.143 Flight Limitations in the Proximity of Space Flight Operations

The intent of TFRs issued under this section is to provide a safe environment for space agency operations and to segregate nonparticipating aircraft from space flight operations to prevent collisions. TFRs issued under section 91.143 may be issued for Class 2 high-power rockets and Class 3 advanced high-power rockets. These rockets can, very quickly, fly high into the airspace and have the potential to significantly interfere with aircraft. These TFRs cannot be issued for Class 1 amateur rockets because they cannot affect air traffic when operated in accordance with FAA regulations. No person may operate any aircraft within the area designated except as authorized by ATC.

7) 14 CFR 91.144 Temporary Restriction on Flight Operations During Abnormally High Barometric Pressure Conditions

The intent for TFRs issued under this section is to protect flight during abnormally high barometric pressure conditions that exceed or will exceed 31 inches of Mercury. Cool dry air masses may produce barometric pressures in excess of 31.00 inches of Mercury. Many altimeters do not have an accurate means of being adjusted for these settings. When the altimeter cannot be set to the higher pressure setting, the aircraft's actual altitude will be higher than the altimeter indicates. No person may operate an aircraft or initiate a flight contrary to the requirements established and published by this TFR. The administrator is authorized to waiver any restriction issued of this section to permit emergency supply, transport, or medical services to be delivered to isolated communities where the operation can be conducted with an acceptable level of safety.

8) 14 CFR 91.145 Management of Aircraft Operations in the Vicinity of Aerial Demonstrations and Major Sporting Events

The intent of TFRs issued under this section is to designate airspace to protect persons or property on the surface or in the air, in the vicinity of an aerial demonstration or major sporting event of a limited duration. The intent is to maintain safety and efficiency, and to prevent the unsafe congestion of aircraft. Events may include air shows involving the Blue Angels, Thunderbirds, Golden Nights, Olympics, Rose Bowl, World Cup Soccer, the Indianapolis 500 Race, MLB All Star Game, World Series, Albuquerque Balloon Festival, etc.

Certain high profile sporting events such as the Super Bowl or the Olympics may receive stronger restrictions issued under 99.7 Special Security Instructions if it is determined necessary by federal security authorities and the FAA. If the President is in attendance, the sporting event may have additional restrictions in place through a 91.141 TFR.

A TFR issued under 91.145 is typically uses the minimum amount of airspace for the management of security and aircraft operations for the event. For an aerial demonstration, the TFR might be limited to a five NM radius up to an altitude of 17,000 MSL (or 13,000 AGL for parachute demonstrations). For sporting events, the TFR is normally limited to a three NM radius and 2,500' ceiling altitude. Airspace users should check the NOTAM carefully for the exact altitude and radius restrictions.

For an aerial demonstration, an aviation event organizer, or participant may request a TFR by contacting the FAA with two separate requests. The application for the first request is submitted at least 45 days before an aerial demonstration to the Directors of Terminal or En route and Oceanic Area Operations. The second application goes to the appropriate Flight Standards District Office 90 days before a civilian aerial demonstration and 120 days before a military aerial demonstration. Aerial advertisers work with both the FAA and event organizers for waivers to fly within the TFR.

Restrictions issued under this TFR prohibit the operations of any aircraft or device or any activity within the designated airspace area except in accordance with the authorizations, terms, and conditions of the TFR published. **Note:** Aerial demonstrations and sporting events occurring within Class B airspace may be overseen through existing ATC procedures without additional restrictions.

Example of a 91.145 TFR (NOT FOR NAVIGATIONAL PURPOSES)
FDC 7/0421 ZJX FL..AIRSPACE PENSACOLA BEACH, FL..TEMPORARY FLIGHT RESTRICTION. PURSUANT TO 14 CFR SECTION 91.145, MANAGEMENT OF AIRCRAFT OPERATIONS IN THE VICINITY OF AERIAL DEMONSTRATIONS AND MAJOR SPORTING EVENTS, AIRCRAFT OPERATIONS ARE PROHIBITED WITHIN AN AREA DEFINED AS 5 NM RADIUS OF 301936N0870823W (CEW216038.3) SFC-15000FT UNLESS AUTHORIZED BY ATC. EFFECTIVE 1707051230 UTC UNTIL 1707051530 UTC, 1707061800 UTC UNTIL 1707062030 UTC, 1707071600 UTC UNTIL 1707072100 UTC, 1707081600 UTC UNTIL 1707082100 UTC, AND 1707091600 UTC UNTIL 1707092100 UTC. DUE TO THE US NAVY BLUE ANGELS AND OTHER AERIAL DEMONSTRATIONS AT PENSACOLA BEACH AIRSHOW. PAOLO GHIO, TELEPHONE 850-554-xxxx, IS THE AIRSHOW POINT OF CONTACT. PENSACOLA /P31/ APCH, TELEPHONE 850-226-xxxx, IS FAA COORDINATION FACILITY. 1707051230-1707092100

9) 14 CFR 99.7 Special Security Instructions

After the 9/11 tragedies, TFRs have been issued by the FAA citing 14 CFR 99.7 Special Security Instructions, which states “each person operating an aircraft in an ADIZ or Defense Area shall, in addition to the applicable rules of this part, comply with special security instructions issued by the administration in the interest of national security and that are consistent with agreements between the FAA and the DoD.” In other words, the FAA in consultation with DoD or other federal security/intelligence agencies may issue special security instructions to address situations determined to be detrimental to the interests of national defense.

This allows the FAA to issue specific restrictions in the interest of national security. Prior to 9/11, this TFR was rarely used. Since then, numerous TFRs have been established under the authority of this NOTAM. 99.7 TFRs have been issued for various military facilities, to protect space shuttle launches, to protect major sporting events such as the World Series, Super Bowl, and the Olympics and to accommodate flight patterns of DoD UAS. In addition, Congress issued legislation granting a 99.7 TFR over Disneyland and Disneyworld.

Example of a 99.7 TFR (NOT FOR NAVIGATIONAL PURPOSES)
DC 7/1092 ZAB PART 1 OF 2 AZ..AIRSPACE LIBBY AAF, AZ..TEMPORARY FLIGHT RESTRICTIONS. JULY 2-3, 2017, LOCAL. PURSUANT TO 49 USC 40103(B), THE FEDERAL AVIATION ADMINISTRATION (FAA) CLASSIFIES THE AIRSPACE DEFINED IN THIS NOTAM AS 'NATIONAL DEFENSE AIRSPACE'. ANY PERSON WHO KNOWINGLY OR WILLFULLY VIOLATES THE RULES CONCERNING OPERATIONS IN THIS AIRSPACE MAY BE SUBJECT TO CERTAIN CRIMINAL PENALTIES UNDER 49 USC 46307. PILOTS WHO DO NOT ADHERE TO THE FOLLOWING PROCEDURES MAY BE INTERCEPTED, DETAINED, AND INTERVIEWED BY LAW ENFORCEMENT/SECURITY PERSONNEL. PURSUANT TO TITLE 14 CFR SECTION 99.7, SPECIAL SECURITY INSTRUCTIONS, ALL AIRCRAFT FLIGHT OPERATIONS ARE PROHIBITED WITHIN AN AREA DEFINED AS 313416N1101130W TO 313414N1103014W THEN CLOCKWISE ON A 8 NM ARC CENTERED ON

313415N1102052W TO THE POINT OF ORIGIN 9000FT MSL-17999FT MSL EFFECTIVE 1707030330 UTC (2030 LOCAL 07/02/17) UNTIL 1707031120 UTC (0420 LOCAL 07/03/17). 1707030330-1707031120 END PART 1 OF 2 FDC 7/1092 ZAB PART 2 OF 2 AZ..AIRSPACE LIBBY AAF, AZ..TEMPORARY FLIGHT EXCEPT AS SPECIFIED BELOW AND/OR UNLESS AUTHORIZED BY ATC: 1. ALL AIRCRAFT ENTERING OR EXITING THE TFR MUST BE ON A DISCRETE CODE ASSIGNED BY AN AIR TRAFFIC CONTROL (ATC) FACILITY. 2. AIRCRAFT MUST BE SQUAWKING THE DISCRETE CODE AT ALL TIMES WHILE IN THE TFR. 3. ALL AIRCRAFT ENTERING OR EXITING THE TFR MUST REMAIN IN TWO-WAY RADIO COMMUNICATIONS WITH ATC. 4. ALBUQUERQUE ARTCC, TELEPHONE 505-856-xxxx, IS THE FAA COORDINATION FACILITY. 1707030330-1707031120 END PART 2 OF 2

Disney TFRs: After 9/11, Congressional action placed a Temporary Flight Restriction over the Disneyland Theme Park and Disney World. A NOTAM has been issued by the FAA reflecting that this TFR is a 99.7 restriction for a 3 NM circle up to 3000' AGL. There are approval waivers available for aircraft who must fly in that particular airspace. Further information is available on the Transportation Security Administration (TSA) website noted in the NOTAM.

Example of Disney TFR NOTAM (NOT FOR NAVIGATIONAL PURPOSES):
FDC 4/3635 ZLA PART 1 OF 2 SPECIAL SECURITY NOTICE. DISNEYLAND THEME PARK, ANAHEIM, CA. THIS NOTAM REPLACES NOTAM 9/5145 TO REFLECT A TRANSPORTATION SECURITY ADMINISTRATION (TSA) WEBSITE UPDATE AND ADDITIONAL INFORMATION CONCERNING AIRSPACE WAIVERS. FLIGHT RESTRICTIONS IN THIS NOTAM COMPLY WITH STATUTORY MANDATES DETAILED IN SECTION 352 OF PUBLIC LAW 108-7 AS AMENDED BY SECTION 521 OF PUBLIC LAW 108-199. PURSUANT TO 49 USC 40103(B), THE FEDERAL AVIATION ADMINISTRATION (FAA) CLASSIFIES THE AIRSPACE DEFINED IN THIS NOTAM AS 'NATIONAL DEFENSE AIRSPACE'. ANY PERSON WHO KNOWINGLY OR WILLFULLY VIOLATES THE RULES PERTAINING TO OPERATIONS IN THIS AIRSPACE MAY BE SUBJECT TO CERTAIN CRIMINAL PENALTIES UNDER 49 USC 46307. PILOTS WHO DO NOT ADHERE TO THE FOLLOWING PROCEDURES MAY BE INTERCEPTED, DETAINED, AND INTERVIEWED BY LAW ENFORCEMENT/SECURITY PERSONNEL. PURSUANT TO 14 CFR SECTION 99.7, SPECIAL SECURITY INSTRUCTIONS; ALL AIRCRAFT FLIGHT OPERATIONS, INCLUDING UNMANNED AND REMOTE CONTROLLED AIRCRAFT, ARE PROHIBITED WITHIN A 3 NMR OF 334805N/1175517W OR THE SLI066006.8 UP TO AND INCLUDING 3000FT AGL. 1410271500-PERM END PART 1 OF 2 FDC 4/3635 ZLA PART 2 OF 2 SPECIAL THE RESTRICTIONS DO NOT APPLY TO THOSE AIRCRAFT AUTHORIZED BY AND IN CONTACT WITH ATC FOR OPERATIONAL OR SAFETY OF FLIGHT PURPOSES, DEPARTMENT OF DEFENSE, LAW ENFORCEMENT, AND AIR AMBULANCE FLIGHT OPERATIONS. FLIGHTS CONDUCTED FOR OPERATIONAL PURPOSES OF ANY DISNEYLAND EVENT AND VENUE ARE AUTHORIZED WITH AN APPROVED WAIVER. AN FAA AIRSPACE WAIVER DOES NOT RELIEVE OPERATORS FROM OBTAINING ALL OTHER NECESSARY AUTHORIZATIONS AND COMPLYING WITH ALL APPLICABLE FEDERAL AVIATION REGULATIONS. ALL PREVIOUSLY ISSUED WAIVERS TO FDC NOTAM 9/5145 REMAIN VALID UNTIL THE SPECIFIED END DATE BUT NOT TO EXCEED 90 DAYS FOLLOWING THE EFFECTIVE DATE OF THIS NOTAM. INFORMATION ABOUT AIRSPACE WAIVER APPLICATIONS AND TSA SECURITY

AUTHORIZATIONS CAN BE FOUND AT HTTP://WWW.TSA.GOV/STAKEHOLDERS/AIRSPACE-WAIVERS-0 OR BY CALLING TSA AT 571-227-xxxx 1. SUBMIT REQUESTS FOR FAA AIRSPACE WAIVERS AT HTTPS://WAIVERS.FAA.GOV 1410271500-PERM END PART 2 OF 2

Stadium Temporary Flight Restrictions (TFRS): After 9/11, Congress passed statutory mandate in Section 352 of Public Law 108-7 (amended by Section 521 of Public Law 108-199) that defines certain airspace over stadiums as special security airspace under 99.7. The stadium must have a seating capacity of 30,000 or more (regular or post season) for Major League Baseball, NASCAR Sprint Cup, NFL, NCAA Division One Football Games, INDY Car, and Champ Car series excluding qualifying and pre-race events, The TFR is for 3000' AGL and 3 NM radius. AOPA maintains a list of all involved stadiums on their website at http://www.aopa.org/.

Example of Stadium TFR NOTAM (NOT FOR NAVIGATIONAL PURPOSES):
FDC 4/3621 FDC PART 1 OF 3 SPECIAL SECURITY NOTICE SPORTING EVENTS. THIS NOTAM REPLACES FDC NOTAM 9/5151 TO REFLECT A TRANSPORTATION SECURITY ADMINISTRATION (TSA) WEBSITE UPDATE AND ADDITIONAL INFORMATION CONCERNING AIRSPACE WAIVERS. FLIGHT RESTRICTIONS IN THIS NOTAM COMPLY WITH STATUTORY MANDATES DETAILED IN SECTION 352 OF PUBLIC LAW 108-7 AS AMENDED BY SECTION 521 OF PUBLIC LAW 108-199. PURSUANT TO 49 USC 40103(B), THE FEDERAL AVIATION ADMINISTRATION (FAA) CLASSIFIES THE AIRSPACE DEFINED IN THIS NOTAM AS 'NATIONAL DEFENSE AIRSPACE'. ANY PERSON WHO KNOWINGLY OR WILLFULLY VIOLATES THE RULES PERTAINING TO OPERATIONS IN THIS AIRSPACE MAY BE SUBJECT TO CERTAIN CRIMINAL PENALTIES UNDER 49 USC 46307. PILOTS WHO DO NOT ADHERE TO THE FOLLOWING PROCEDURES MAY BE INTERCEPTED, DETAINED, AND INTERVIEWED BY LAW ENFORCEMENT/SECURITY PERSONNEL. PURSUANT TO 14 CFR SECTION 99.7, SPECIAL SECURITY INSTRUCTIONS, COMMENCING ONE HOUR BEFORE THE SCHEDULED TIME OF THE EVENT UNTIL ONE HOUR AFTER THE END OF THE EVENT. ALL AIRCRAFT OPERATIONS; INCLUDING PARACHUTE JUMPING, UNMANNED AIRCRAFT AND REMOTE CONTROLLED AIRCRAFT, ARE PROHIBITED WITHIN A 1410271420-PERM END PART 1 OF 3 FDC 4/3621 FDC PART 2 OF 3 SPECIAL 3NMR UP TO AND INCLUDING 3000FT AGL OF ANY STADIUM HAVING A SEATING CAPACITY OF 30,000 OR MORE PEOPLE WHERE EITHER A REGULAR OR POST SEASON MAJOR LEAGUE BASEBALL, NATIONAL FOOTBALL LEAGUE, OR NCAA DIVISION ONE FOOTBALL GAME IS OCCURRING. THIS NOTAM ALSO APPLIES TO NASCAR SPRINT CUP, INDY CAR, AND CHAMP SERIES RACES EXCLUDING QUALIFYING AND PRE-RACE EVENTS. FLIGHTS CONDUCTED FOR OPERATIONAL PURPOSES OF ANY EVENT, STADIUM OR VENUE AND BROADCAST COVERAGE FOR THE BROADCAST RIGHTS HOLDER ARE AUTHORIZED WITH AN APPROVED AIRSPACE WAIVER. AN FAA AIRSPACE WAIVER DOES NOT RELIEVE OPERATORS FROM OBTAINING ALL OTHER NECESSARY AUTHORIZATIONS AND COMPLYING WITH ALL APPLICABLE FEDERAL AVIATION REGULATIONS. THE RESTRICTIONS DESCRIBED ABOVE DO NOT APPLY TO THOSE AIRCRAFT AUTHORIZED BY AND IN CONTACT WITH ATC FOR OPERATIONAL OR SAFETY OF FLIGHT PURPOSES, DEPARTMENT OF DEFENSE, LAW ENFORCEMENT, AND AIR AMBULANCE FLIGHT OPERATIONS. ALL PREVIOUSLY ISSUED WAIVERS TO FDC

NOTAM 9/5151 REMAIN VALID UNTIL THE SPECIFIED END DATE BUT NOT TO EXCEED 90 DAYS FOLLOWING THE EFFECTIVE DATE OF THIS NOTAM. INFORMATION ABOUT AIRSPACE WAIVER APPLICATIONS 1410271420-PERM END PART 2 OF 3 FDC 4/3621 FDC PART 3 OF 3 SPECIAL AND TSA SECURITY AUTHORIZATIONS CAN BE FOUND AT HTTP://WWW.TSA.GOV/STAKEHOLDERS/AIRSPACE-WAIVERS-0 OR BY CALLING TSA AT 571-227-2071. SUBMIT REQUESTS FOR FAA AIRSPACE WAIVERS AT HTTPS://WAIVERS.FAA.GOV. 1410271420-PERM END.

Dams and Nuclear Power Plant Restrictions:

In the interest of national security, the FAA has an advisory notice for pilots to avoid the airspace above power plants such as nuclear, hydroelectric, or coal; dams, refineries, industrial complexes, military facilities, and other "similar" facilities. There is no main list on the internet (such as the stadium listing) of these sites. There is no penalty listed but this is a national security notice.

Example of a National Security NOTAM:
FDC 6/8818–...SPECIAL NOTICE...IN THE INTEREST OF NATIONAL SECURITY AND TO THE EXTENT PRACTICABLE, PILOTS AND UAS OPERATORS ARE STRONGLY ADVISED TO AVOID THE AIRSPACE ABOVE OR IN CLOSE PROXIMITY TO CRITICAL INFRASTRUCTURE AND OTHER SENSITIVE LOCATIONS SUCH AS POWER PLANTS (NUCLEAR, HYDROELECTRIC, OR COAL), DAMS, REFINERIES, INDUSTRIAL COMPLEXES, MILITARY FACILITIES, CORRECTIONAL AND LAW ENFORCEMENT FACILITIES UNLESS OTHERWISE AUTHORIZED. PILOTS AND UAS OPERATORS SHOULD NOT CIRCLE AS TO LOITER IN THE VICINITY OVER THESE TYPES OF FACILITIES. 23 MAR 15:38 2016 UNTIL PERM. CREATED: 23 MAR 15:37

Requests for a TSA Waiver to 14 CFR 99.7 TFRs:

TSA manages the process and assists with the review of GA aircraft operators who request to enter areas of restricted airspace. For each waiver applicant to support the vetting requirements, last name, first name, social security number, date of birth and place of birth, are collected. For applications for aircraft operating into, out of, within, or overflying the United States, the waiver review process includes an evaluation of the aircraft, crew, passengers, and purpose of flight. The office then adjudicates the application and provides a recommendation of approval or denial to the FAA Office of Air Traffic Services. ALL WAIVERS REQUIRE five to seven DAYS FOR PROCESSING.

The responsibility for managing the waiver process is shared by the FAA and the TSA. The FAA asserts the safety provisions of the process while TSA manages the security portion of the process. These agencies work together to ensure the security of aircraft conducting operations within RAs. These areas are in place to mitigate the threat of an airborne attack against key assets and critical infrastructure on the ground.

Application

Apply for any type of airspace waiver online through the FAA/TSA Airspace Access Program (https://www.faa.gov/). First-time users will need to register as a new user.

Types of Waivers for 14 CFR 99.7 TFRs:

1) Special Events

   Special Event Waivers permit authorized flight operations with the TFR established for special events. Examples of special events might include Democratic National Convention, Republican National Convention, State of the Union Address, Super Bowl, and more.

2) Washington, D.C., Air Defense Identification and FRZs

   The Air Defense Identification Zone mirrors the footprint of the Baltimore Washington Class B airspace and consists of the airspace within approximately 42 NMs of Reagan National Airport.

3) Disney Theme Parks

   Disney Theme Park waivers permit flight operations within the TFRs areas established for Disneyland and Disney World Theme Parks.

4) Major Sporting Events

   Sporting Event Waivers permit flight operations within the TFRs established for National Football League, Major League Baseball, NCAA Division I Football, NASCAR Nextel Cup Series main events, and INDY Racing League main events occurring in stadiums with a seating capacity of 30,000 or more.

5) International Waivers

   International Waivers authorize aircraft operators to operate to/from and over the airspace of the United States and its territorial possessions. No Transponder Waivers authorize VFR operations to/from and within the airspace of the United States without an operating encoding transponder.

6) General Information and Requirements

   The TSA waiver form is two pages in length. The first page contains company, aircraft, pilot and crew, and flight itinerary information. The second page is a security statement that includes security measures taken when an aircraft is not operational and an affirmation of authorized personnel on board the aircraft. The information on both pages of the waiver request form must be submitted for the waiver to be processed.

14 CFR 91.137(a.)(2.) TFR in the Vicinity of Disaster/Hazard Areas

The intent of TFRs issued under this paragraph is to provide a safe environment for the operation of disaster relief aircraft. This is the most common of TFRs for land management agencies that contend with wildland fires. It includes but is not limited to:

- Wildland fires which are being fought with the assistance of aviation resources,
- Aircraft relief activities following a disaster (earthquake, tidal wave, flood, hurricane, etc.), and
- Aircraft accident sites at the discretion of the FAA.

Example of a 91.137(a)(2) TFR (NOT FOR NAVIGATIONAL PURPOSES)
FDC 7/2011 ZLC ID..AIRSPACE 51NM NORTHWEST OF TWIN FALLS, IDAHO..TEMPORARY FLIGHT RESTRICTIONS WI AN AREA DEFINED AS 5 NM RADIUS OF 425539N/1152542W (TWIN FALLS VORTAC TWF285049.5) SFC-10000FT. TO PROVIDE A SAFE ENVIRONMENT FOR WILDLAND FIRE FIGHTING AVIATION OPERATIONS. PURSUANT TO 14 CFR SECTION 91.137(A)(2) TEMPORARY FLIGHT RESTRICTIONS ARE IN EFFECT. BLM TWIN FALLS DISTRICT TELEPHONE 208-732-xxxx OR FREQ 118.125/SAND POINT FIRE IS IN CHARGE OF THE OPERATION. SALT LAKE CITY /ZLC/ ARTCC TELEPHONE 801-320-xxxx IS THE FAA COORDINATION FACILITY. 1706291200-1709282146

The authority for agency personnel to request a TFR for land management activity or emergencies is found in CFR 91.137. TFRs are normally ordered through the dispatch ordering process or channels. Dispatchers maintain the request on an aircraft resource order form that allows the TFR to be tracked, documented, and closed.

The Federal Aviation Regulation that defines this kind of TFR is found at:

https://www.ecfr.gov/current/title-14/chapter-I/subchapter-F/part-91/subpart-B.

14 CFR 91.137 (a) (2) Temporary Flight Restrictions in the Vicinity of Disaster/Hazard Areas

(a) The Administrator will issue a NOTAM designating an area within which TFRs apply and specifying the hazard or condition requiring their imposition, whenever he determines it is necessary in order to—

(1) Protect persons and property on the surface or in the air from a hazard associated with an incident on the surface.

(2) Provide a safe environment for the operation of disaster relief aircraft; or

(3) Prevent an unsafe congestion of sightseeing and other aircraft above an incident or event which may generate a high degree of public interest.

The Notice to Airmen will specify the hazard or condition that requires the imposition of TFRs.

(b) When a NOTAM has been issued under paragraph (a)(1) of this section, no person may operate an aircraft within the designated area unless that aircraft is participating in the hazard relief activities and is being operated under the direction of the official in charge of on-scene emergency response activities.

(c) When a NOTAM has been issued under paragraph (a)(2) of this section, no person may operate an aircraft within the designated area unless at least one of the following conditions are met:

(1) The aircraft is participating in hazard relief activities and is being operated under the direction of the official in charge of on-scene emergency response activities.

(2) The aircraft is carrying law enforcement officials.

(3) The aircraft is operating under the ATC approved IFR flight plan.

(4) The operation is conducted directly to or from an airport within the area or is necessitated by the impracticability of VFR flight above or around the area due to weather, or terrain; notification is given to the FSS or ATC facility specified in the NOTAM to receive advisories concerning disaster relief aircraft operations; and the operation does not hamper or endanger relief activities and is not conducted for the purpose of observing the disaster.

(5) The aircraft is carrying properly accredited news representatives, and, prior to entering the area, a flight plan is filed with the appropriate FAA or ATC facility specified in the Notice to Airmen and the operation is conducted above the altitude used by the disaster relief aircraft, unless otherwise authorized by the official in charge of on-scene emergency response activities.

91.137 (a) (2) is the TFR most commonly used for disaster relief incidents. While the intent is meant to keep nonparticipating aircraft away from aircraft engaged in firefighting activities or disaster relief activities, it is important that disaster relief officials understand that certain aircraft ARE ALLOWED INSIDE THE TFR that may not be participating aircraft in the disaster relief. The following five categories of aircraft are allowed entry into a 91.137(a.)(2.) TFR:

1) Participating Aircraft

This refers to aircraft that are participating in hazard relief activities and are being operated under the direction of the official in charge of the on-scene emergency response activity. These may include helicopters, airtankers, air attack and lead planes, smokejumper and infrared aircraft, and aircraft determined to be participating in the hazard relief effort. Fire Mission Aircraft, not assigned to the incident meet the definition of participating aircraft. They may request real-time access into or through a TFR, and permission may be granted real-time by the designated official in charge of on-scene emergency response.

The following missions may be determined to be participating in the hazard relief effort, Safety and Security, Food, Water, Shelter, Health and Medical, Energy, Communications, Transportation, and Hazardous Materials. Please see below and Appendix for internal procedures for coordination.

Definition of Participating Aircraft

The mission must be identified as participating in at least one of the Community Life Lines; as defined in the National Response Framework (NRF): Safety and Security; Food, Water, and Shelter; Health and Medical; Energy (Power and Fuel); Communications; Transportation; and Hazardous Materials.

Each category defined below as found in the NRF Fourth Edition October 28, 2019.

Safety and Security: Law enforcement and government services, as well as the associated assets that maintain communal security, provide search and rescue, evacuations, and firefighting capabilities, and promote responder safety.

Food, Water, Shelter: Support systems that enable the sustainment of life, such as water treatment, transmission, and distribution systems; food retail and distribution networks; wastewater collection and treatment systems; as well as sheltering, and agriculture.

Health and Medical: Infrastructure and service providers for medical care, public health, patient movement, fatality management, behavioral health, veterinary support, and health or medical supply chains.

Energy: Service providers for electric power infrastructure, composed of generation, transmission, and distribution systems, as well as gas and liquid fuel processing, transportation, and delivery systems. Disruptions can have a limiting effect on the functionality of other community lifelines.

Communications: Infrastructure owners and operators of broadband internet, cellular networks, landline telephony, cable services (to include undersea cable), satellite communications services, and broadcast networks (radio and television). Communication systems encompass a large set of diverse modes of delivery and technologies, often intertwined but largely operating independently. Services include elements such as alerts, warnings, and messages, as well as 911 and dispatch.

Transportation: Multiple modes of transportation that often serve complementary functions and create redundancy, adding to the inherent resilience in overall transportation networks. Transportation infrastructure generally includes highway/roadways, mass transit, railway, aviation, maritime, pipeline, and intermodal systems.

Hazardous Materials: Systems that mitigate threats to public health/welfare and the environment. This includes assessment of facilities that use, generate, and store hazardous substances, as well as specialized conveyance assets and efforts to

identify, contain, and remove incident debris, pollution, contaminants, oil, or other hazardous substances.

Agency aircraft that are not assigned to the incident may be considered intruders.

- Agency VIP flights that have not been prearranged with dispatch and air operations.
- Recon, spray, resource, pest, or mapping aircraft on normal agency business.
- Aircraft that do not follow agency FTA procedures.

There are occasional circumstances in which non-agency aircraft need to operate within a TFR in response to the emergency and can be determined to be participating in the hazard relief activities. One example that meets the definition of participating in the category of Energy, could be a power company that needs to assess the location and extent of damage to a power line corridor that was impacted by the fire using a company helicopter. In order to assess damage and develop work plans to repair the power grid, the power company will need to complete the request requirements to be determined as participating and coordinate the time and location of their mission with the official in charge of the on-scene emergency response. They will utilize the agency air-to-air frequency to remain in contact with an aerial supervisor while they are operating in the fire area. Communication and coordination are essential to address the requirement for separation from other tactical aircraft and mid-air collision avoidance. This may be effectively achieved by authorizing the power company flight to occur at a time of day when fire aircraft are not present, or through spatial separation. When incorporated into the air operation, that aircraft may justifiably be considered an essential resource participating in the disaster relief effort. When circumstances such as this occur, the AOBD, ATGS, or determined official in charge, will notify the local dispatch, so that the presence of power company aircraft is not inadvertently reported as an unauthorized intrusion.

2) Law Enforcement

Under this type of TFR, law enforcement officials are allowed into the TFR area. There is no caveat within the regulation that requires prior notification or communication during their flight. Agency personnel are strongly recommended to coordinate frequency sharing and TFR information with local law enforcement agencies that may utilize aircraft.

3) IFR Traffic

The FAA has the right to route aircraft operating under ATC approved IFR flight plans through this kind of TFR. This may occur if the TFR is located inside the approach and departure airspace for an airport.

Note: FAA ATC **must coordinate** with the official in charge of the on-scene emergency response activities **prior** to allowing any IFR or VFR aircraft to enter into TFR area. Normally, this is performed by the ARTCC calling the dispatch center phone number that is published in the TFR NOTAM.

The FSS or ATC facility receiving flight plans for aircraft wishing to transition through the TFR should receive the following information: Aircraft identification, type and color, radio communication frequencies to be used, proposed time of entry of and exit from the designated area, name of news media or organization and purpose of flight, and any other information requested by ATC.

4) Airport Traffic

TFRs do not close airports. When an airport is within or adjacent to this kind of TFR, VFR traffic is still allowed inside the TFR if the flight operation is conducted directly to or from an airport within the area or is necessitated by the impracticality of VFR flight above or around the area due to weather, or terrain.

Notification is given to the FSS or ATC facility that is specified in the TFR to receive advisories concerning disaster relief aircraft operations.

The TFR states that flight operations should not hamper or endanger relief activities, and that operations should not be conducted for the purpose of observing the disaster.

An "airport" refers any airport depicted on a sectional chart. A designated "seaplane base" is charted by a small circle with a boat anchor symbol inside. Seaplane bases usually have clearly defined lanes for ingress, egress, and water taxiing identified for each base.

When a large TFR is established, nonparticipating aircraft may legally fly from one airport to another inside the TFR or conduct a flight between an airport outside of the TFR and one that is inside the TFR boundary. Disaster relief aviation operations in the vicinity of an airport requires careful coordination and a heightened awareness of "see and avoid."

Note: Situations have occurred where an ATGS (or other aerial supervisor) who has spent significant time in a local unit or at an FBO, developed relationships with local pilots. When the pilots asked if they can fly through the TFR instead of going around, the accommodating ATGS has allowed GA and other types of nonparticipating aircraft to fly through the TFR. There is NO provision legally within the Temporary Flight Regulations that allows nonparticipating aircraft to fly through the TFR unless they meet the above criteria. While this practice is rumored to be common, it is against the established Federal Aviation Regulation under which the TFR is issued. Nonparticipating aircraft are NOT allowed to fly within the TFR according to the FAA and should be kept out.

5) Media

Media access to this type of TFR may be the most misunderstood aspect of aircraft allowed into a TFR. According to 91.137(a)(2), the following circumstances apply to media entry:

- The aircraft is carrying properly accredited news representatives.
- Prior to entering the TFR, a flight plan is filed by the media aircraft with the appropriate FAA or ATC facility specified in the TFR NOTAM.
- The operation is conducted above the altitude used by the disaster relief aircraft, unless otherwise authorized by the official in charge of on-scene emergency response activities (i.e., the aerial supervisor).

This last item has caused the most discussion and inconsistencies in procedure. The FAA interpretation is that media aircraft are allowed inside a TFR as long as they maintain an altitude above disaster relief aircraft. If the disaster relief aircraft happen to be on the ground, then the media has been known to fly at any altitude within the TFR.

No parameters are set that require communication by the media with either dispatch or the disaster relief officials in charge prior to flight. Aerial Supervisors are reminded that if the media have met the above criteria, they are allowed inside the TFR. Aerial Supervisors have the right to

allow the media to fly at lower altitudes when it can be safely accomplished, but do not have the authority to remove the media from the TFR if they have met the criteria stated in 91.137 (c).

Agency personnel are strongly recommended to hold preseason meetings with local media that use aviation resources. Meetings should cover frequencies, TFR procedures, dispatch contact numbers, basic ICS structure, local hazards, and any other local concerns.

News media requesting to fly a UAS within a TFR should be referred to the FAA's Systems Operations Security branch to discuss obtaining a Special Government Interest (SGI) Addendum to their existing Certificate of Authorization (COA) in accordance with FAA Joint Orders 7200.23. (Systems Operations Security may be reached at 202-267-8276.) Once vetted and approved by FAA Systems Operations Security, the media will coordinate with the agency "official in charge" named in the NOTAM to coordinate the time, location, and duration of access into the TFR. This will normally be delegated to the ATGS or AOBD on large incidents.

Note: An SGI Addendum is appropriate for media UAS operations since the current traditional language found in the TFR exceptions list in 14 CFR 91.137 (c.) (5.) is written to be applicable to crewed aircraft operations that are "carrying properly accredited news media" and capable of operating "above the altitude used by the disaster relief aircraft…"

A media UAS operation within a TFR that is not communicated and coordinated in advance with incident personnel or is not conducted under the terms and conditions of their COA and SGI Addendum warrants notification to the ARTCC and follow-up action by the FAA.

Internal Procedures for Hazard Relief Participating Aircraft Within Incident TFRs

Note: Approval for participation will occur at two levels. First will be the aviation officer who will determine applicable criteria for participation. Secondly will be the official in charge on the on-scene emergency or delegated position.

This guidance is explicit to aircraft participating in hazard relief mission(s) within a TFR. It also does not pertain to media aircraft as there are separate established protocols in place for them.

The Participant Pilot is required to establish contact with the TFR's managing dispatch office listed on the NOTAM and submit the request by 1800 hrs the day prior to mission for next day consideration.

The TFR's Incident Dispatch Office Should:

- Gather requestor call back information and provide a dispatch email address to the requestor pilot or point of contact.
- Send the requestor the *Hazard Relief Participant Request Form*, PMS 520-1, or link to the document: https://www.nwcg.gov/publications/520-1.
- Once the managing dispatch office receives the completed request, they forward the request to their aviation officer (UAO, UAM, FAO, SAM, AOBD, HLCO, IC, etc.) to determine if request meets the criteria to participate.

The Aviation Officer Will:

- Make the determination that the requestor meets the criteria for participation.
- Completes the initial review and forwards the completed request to the official in charge of the on-scene emergency response according to the 91.137(a)(2) TFR, and coordinates with the managing dispatch center.

Official in Charge of the On-scene Emergency Response or As Delegated According to 91.137(a)(2) Temporary Flight Restriction Will:

- Prior to mission, approve or deny the request, will contact/coordinate with the managing dispatch center and the requesting Participant Pilot to discuss details on the mission, time frames, and verify frequencies, including:
    - Establish that participants will be obliged to withdraw from activities if negotiations/coordination fails or is violated.
    - Upon initial radio contact with the Participant Aircraft, the aerial supervisor will provide direction for entering, working in, and departing TFR.
    - Ensure that participants have a plan in place for suspending or withdrawing from engagement if/when safety concerns arise.

Incident Commander Should:

- The IC should designate who the official in charge of the Temporary Flight Restriction is via email with a CC to the UAO, RAO, RASM, Managing Dispatch, and Cooperators.

If the Managing Office Is the Geographic Area Coordination Center, They Will Forward the Requests To:

- Local/Tier 3 dispatch centers, who will share with
    - Respective Unit Aviation Officer(s).
    - Official in charge of the on-scene emergency response or as delegated respective state and/or Regional Federal Aviation Officers.

If the Managing Office Is a Local Center, They Will Forward the Request To:

- Geographic Area Coordination Center Airspace points of contact (POC), who will share with the respective state and Federal Aviation Officer(s) of jurisdiction.
- Respective Unit Aviation Officer(s).

Agency TFR Requests

Agency TFR requests are usually identified by one of two means:

1) Field Generated Need: A TFR request may be submitted to the local unit dispatch office, GACC, or agency aviation manager by an incident commander or their authorized representative such as the AOBD, aerial supervisor, or other on-scene personnel.
2) Dispatch, ASCO, or Aviation Manager Generated Need**:** The request may be initiated by a dispatcher, ASCO, or unit aviation manager who has been in contact with the FAA, Military, or other stakeholder which resulted in a mutual understanding of the need. The incident commander, ATGS, and AOBD should be notified of any intent to order a TFR if they did not initiate the request.

Criteria for Determining the Need for a TFR

TRFs should not be an automatic response for every dispatch involving aircraft. Considerable thought should go into the determination of need for a TFR. If using a risk assessment to determine the need, consider the following:

- Type and number of aircraft operations (air tactical, airtanker, helicopter, smokejumper, etc.) occurring within the incident and their aeronautical requirements (orbit dimensions, both vertically and horizontally).
- Entry and exit points and routes for disaster relief aircraft.
- Multiple incidents in close proximity.
- When the extent and complexity of the operation creates a hazard to nonparticipating aircraft.
- Extended operations (more then three hours) are anticipated.
- Operations are in the vicinity of high-density aircraft traffic.
- Incident is expected to attract sightseeing aircraft and or hobbyist/recreational unstaffed aircraft.
- Operations are conducted near or in the dimensions of a MTR, VFR Helicopter Aerial Refueling Routes, Slow Routes, or Special Use Airspace.
- Incident is conducted in or near a Victor Flyway.
- “See and Avoid” capability is reduced or compromised.
- There have been situations involving unstaffed aircraft that would warrant closure of the airspace for the protection of disaster relief aircraft.

Figure 6-3: Criteria for Determining the Need for a TFR

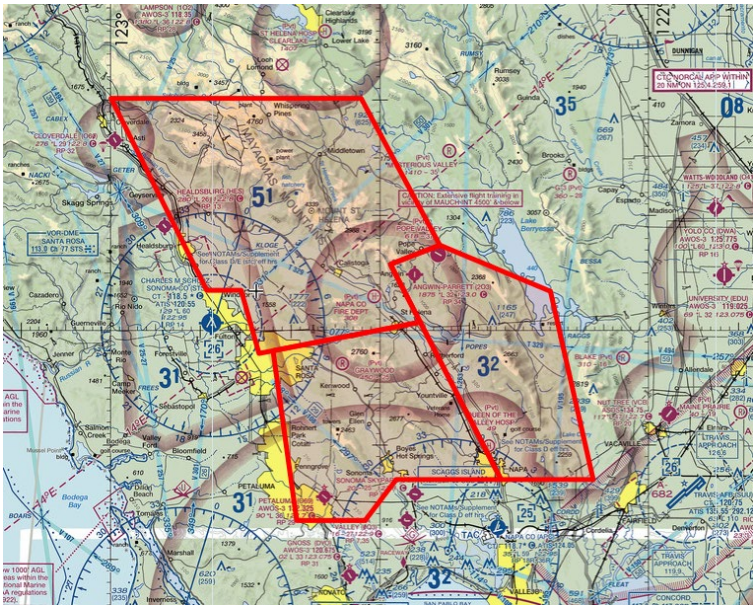


Figure 6-4: Example of Adjoining Multi-TFR Complex

Dimensions of a TFR

Unlike most TFRs, 91.137 (a) (2) TFRs might not be circular in shape. Instead, their boundaries conform to the requirements of the agency coordinating relief activities such as a wildfire or hurricane response.

The guidance for a typical circular firefighting TFR is a minimum 7 NM radius and 5000’ above the highest terrain or obstacle in the fire area. However, each incident needs to tailor a TFR to fit their needs if the standard TFR dimension is not appropriate.

1) Lateral Dimension

   Defined as that airspace extending at least 7 NMs from the center point of the area affected by the disaster. Lateral dimensions can be adjusted for smaller or larger incidents, depending on the number and type of aircraft to be utilized, the nature of the terrain adjacent to the fire, etc. Adjust for the least amount deemed necessary (see Figure 6-5 and 6-6).

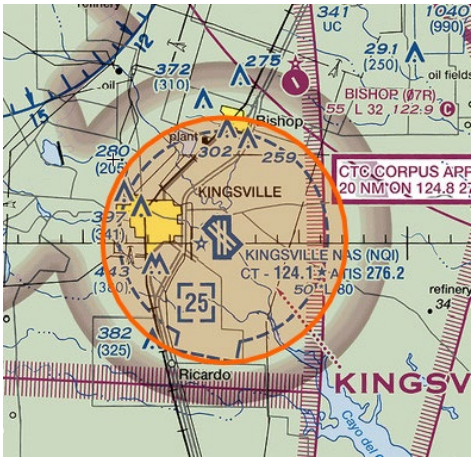


Figure 6-5: Example of a Circular 91.145 TFR with 12 NM Radius for a U.S. Navy Blue Angels Demonstration

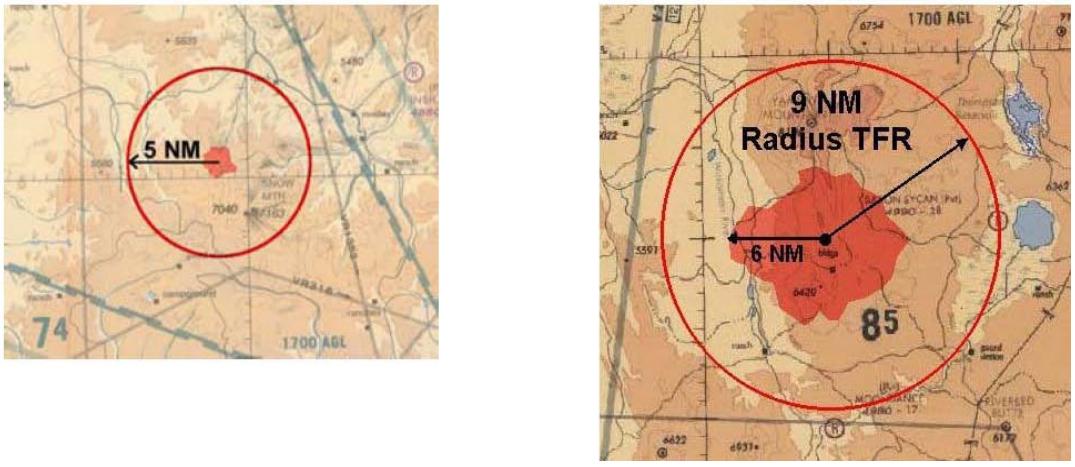


Figure 6-6: Circular TFRs

2) Vertical Dimension–Altitude

   Defined as that airspace extending up to an elevation of 4,500' above the highest terrain of the disaster area or above the operating altitude of participating aircraft within the lateral dimension.

   Sizes and shapes may vary due to the nature of the incident. The most frequently requested shape for small fires is circular with a center point identified. It is possible to request a polygon shaped TFR from the FAA to avoid unnecessary impact to an airport, or to Class B, C, or D airspace designated to the surface. Latitude and longitude points will be required for the corner points of a non-circular polygon TFR.

   The altitude of the TFR ceiling is given to the FAA in relation to MSL. The NOTAM will be issued by the FAA as MSL so that the reference to ceiling height is uniform. Altitude described in terms of distance AGL is unacceptable, as it compromises the safety of aircraft operations. It does not consider terrain changes, differences in-flight altitudes of various aircraft on the incident, or the presence of smoke and its impact on visibility.

   There are occasional situations in which the FAA may not grant the requested dimensions of the TFR due to other activity in the area or because of additional airspace complexities. If the size, shape, or altitude requested is denied, negotiate with them to see if the needs of the disaster and the FAA can be met in a mutual agreed-upon TFR. There may be airport traffic or instrument approach corridors that needs to be considered. Relay issues to the appropriate agency and incident personnel. A qualified Airspace Coordinator can work with the FAA to adjust size and shape of the TFR to mitigate an adverse impact to other users of the airspace.

Factors Which May Affect the Size and Shape of the TFR

It is recommended that a TFR with at least a 7 NM radius circle, extending 4,500' above the highest terrain) be established as a minimum. However, there are a number of factors to consider when determining the size of a TFR, including our responsibility not to impact any more airspace than what is necessary. TFRs may be larger than the suggested standard size or they may be polygons. The following are factors that may affect the size and shape of the TFR:

1) Type and number of aircraft operating within the incident and their orbiting and maneuvering requirements.
2) Aircraft entry and exit points and routes.

3) General aviation, military, VFR airways, airports, or other aircraft operations in the geographic area.
4) Size and rate of spread of the incident.
5) Locations of incident supporting resources. Helibases, staging areas, dip sites, retardant bases.
6) MTR, SUA, SR, Aerial Refueling Routes, Cruise Missile Routes, etc., within or near the TFR area.
7) Multiple incidents in close proximity should use a combined TFR to reduce the impact on the NAS. Do not overlap TFRs on top of each other. Coordinate with other agencies if appropriate.
8) There are situations in which a standard circular horizontal dimension might be altered. For example, there may be a terrain feature such as a ridge line or the shore of a body of water, or an area of SUA where the flight restriction is not needed by incident aircraft. A square or polygon may be the preferred option.
9) The location of a helibase outside a TFR is a consideration for the size and shape of a TFR. The TFR is designed for placement over a specific disaster area and frequently a helibase could be many miles away from the actual disaster. In this case, the FAA has recommended placing a NOTAM (D) over the helibase and remind pilots to practice "see and avoid." If there is SUA or an MTR between the helibase and the incident, notify the military about the TFR, the location of the helibase, and request voluntary deconfliction for the airspace not inside the TFR. Another option is to extend the shape of the TFR to include the SUA or MTR if necessary.

Ordering Procedures for TFR

After the need has been identified, recommended processes for requesting a TFR and notifying military units and local personnel are described below. **Note**: At the time this document is being published, the FAA is in the middle of a 2-3 year process for completely revising the software and processes for ordering TFRs. These instructions and the standardized TFR Request Form we currently use are based on the current NOTAM Entry System (NES). The information we will submit in the new format may be significantly modified in the near future.

Follow procedures as established by your agency. General guidelines for a risk assessment are contained in this chapter. Normally a dispatcher, Airspace Coordinator, or aviation manager (at the unit level) will submit their TFR request to their GACC. The GACC (or Airspace Coordinator assigned to the GACC) will submit the TFR request to the appropriate FAA ARTCC through the FAA's NES.

The TFR Request Form (https://gacc.nifc.gov/sacc/logistics/aircraft/tfr_request_form.pdf) is used to document and submit this information. Complete information is necessary for documentation and for meeting the needs of the FAA. A TFR request is also maintained as an agency record on a Resource Order form. The TFR Request Form, which is found in Chapter 20 of the National Mobilization Guide, is normally attached to the Resource Order with all other documentation.

Ensure that the following information has been completed:

- Resource Order and Aircraft Request Number
- Requesting person's name and phone number
- Latitude/longitude information in Degrees Minutes Seconds
- VHF-AM Air-to-Air contact frequency
- Radius in NM

- Highest base altitude and TFR ceiling altitude

1) Locate the TFR

   Plot the center point of the TFR using a latitude and longitude received from field personnel on a sectional. Convert latitude and longitude to degrees, minutes and seconds using a latitude/longitude conversion program on the internet.

The U.S. NOTAM Office will only accept TFR requests in a Degrees, Minutes, Seconds format. An internal memo within the FAA states the following:

"Effective immediately ensure that all NOTAMs containing latitude and longitude information utilize Degrees, Minutes, Seconds and includes a reference to North latitude (N) and West longitude (W). If seconds are not available, add two zeros for the second spaces. Do not include spaces, commas, dashes, or any other symbols. The standardized format shall be: ddmmssN/dddmmssW." For Example: 450700N/1177005W.

2) Review the TFR and draw it on the sectional using the radius expressed in NMs. Survey the proposed TFR airspace for airports, Class B, C, or D airspace, MTRs, and SUA to assess whether the TFR might complicate or adversely impact ATC or military operations in the NAS. Adjust as needed or call to negotiate any needed modifications.

3) Telephone Number.

   - Use a 24-hour contact number (not a toll-free number) that will be in service after the incident has concluded. This number is normally, but not always the ordering agency's dispatch center. It will also be the POC for other agencies, media, etc., regarding the TFR.
   - Do NOT use an expanded dispatch or a daytime-only phone number.
   - Do NOT use internal Resource Ordering and Status System (ROSS) three letter Unit Identifiers or four letter mnemonic codes on a TFR Request Form (i.e., Requesting Unit, etc.).

4) TFR Description.

   - Use a latitude and longitude in degrees, minutes, or seconds to define the center point of a circle, or the perimeter waypoints of a polygon.
   - NES will provide the closest NAVAID. Do not use NDB (Non-Directional Beacons) or T-VORs.

5) Polygon TFR Shapes.

   - When requesting a polygon TFR, the corner points must be listed in a clockwise sequence around the requested TFR to avoid bow tie depictions.

FDC 7/2017 ZSE WA..AIRSPACE 4 NM SE OF WENATCHEE, WA..TEMPORARY FLIGHT RESTRICTIONS WI AN AREA BOUNDED BY 472147N1200841W (WENATCHEE VOR/DME EAT114003.5) TO 471952N1200511W (WENATCHEE VOR/DME EAT114006.5) TO 471534N1200543W (WENATCHEE VOR/DME EAT136009.7) TO 470845N1201200W (WENATCHEE VOR/DME EAT163015.2) TO 471711N1202143W (WENATCHEE VOR/DME EAT207009.2) BACK TO THE ORIGINAL POINT SFC-8500FT TO PROVIDE A SAFE ENVIRONMENT FOR FIRE FIGHTING AVIATION OPS. PURSUANT TO 14 CFR SECTION 91.137(A)(2) TEMPORARY FLIGHT RESTRICTIONS ARE IN EFFECT. WASHINGTON STATE DNR TELEPHONE 509-884-xxxx OR FREQ 120.025/SPARTAN FIRE IS IN CHARGE OF THE OPS. SEATTLE /ZSE/ ARTCC TELEPHONE 253-351-xxxx IS THE FAA COORDINATION FACILITY. EFFECTIVE 1706290400 UTC UNTIL 1709010600 UTC DLY 1500-0600 1706290400-1709010600

Figure 6-7: Example of a Polygon TFR NOTAM

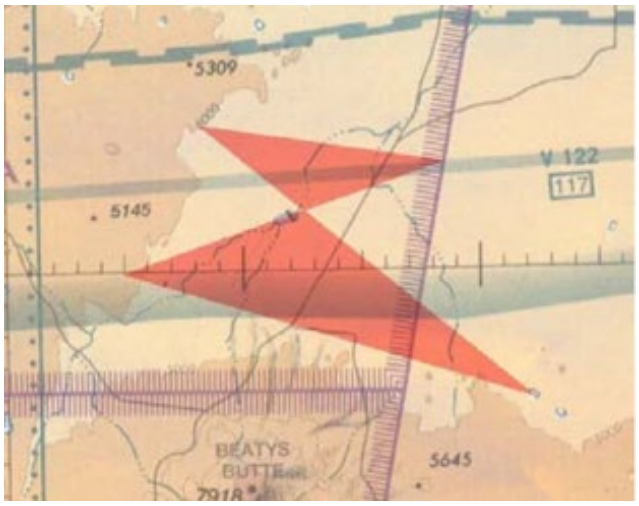


Figure 6-8: TFR Coordinates Entered in Incorrect Clockwise Sequence

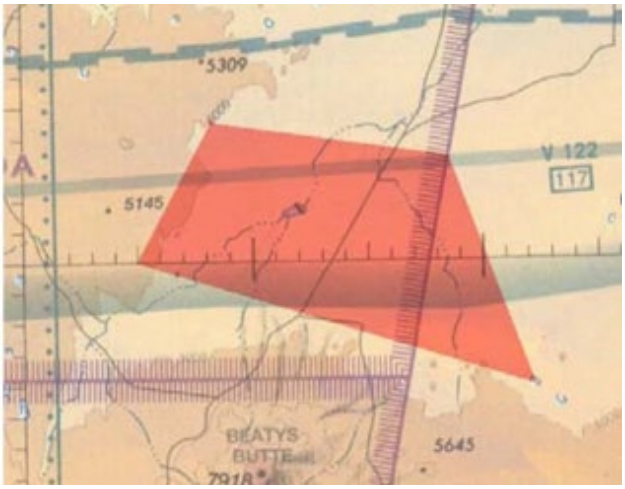


Figure 6-9: TFR Coordinates Entered in Correct Clockwise Sequence Results in Proper Polygon

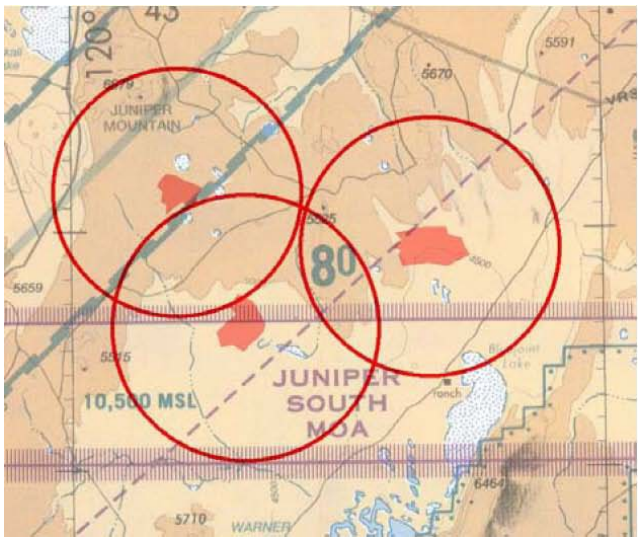


Figure 6-10: Overlapping Circle TFRs

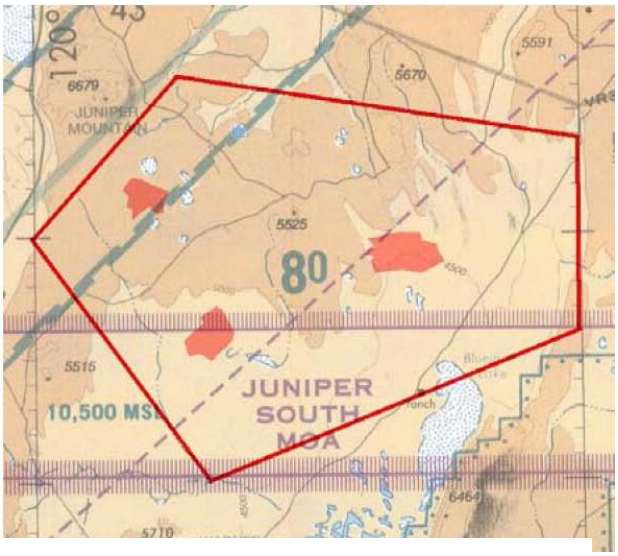


Figure 6-11: Solution to Overlapping TFRs

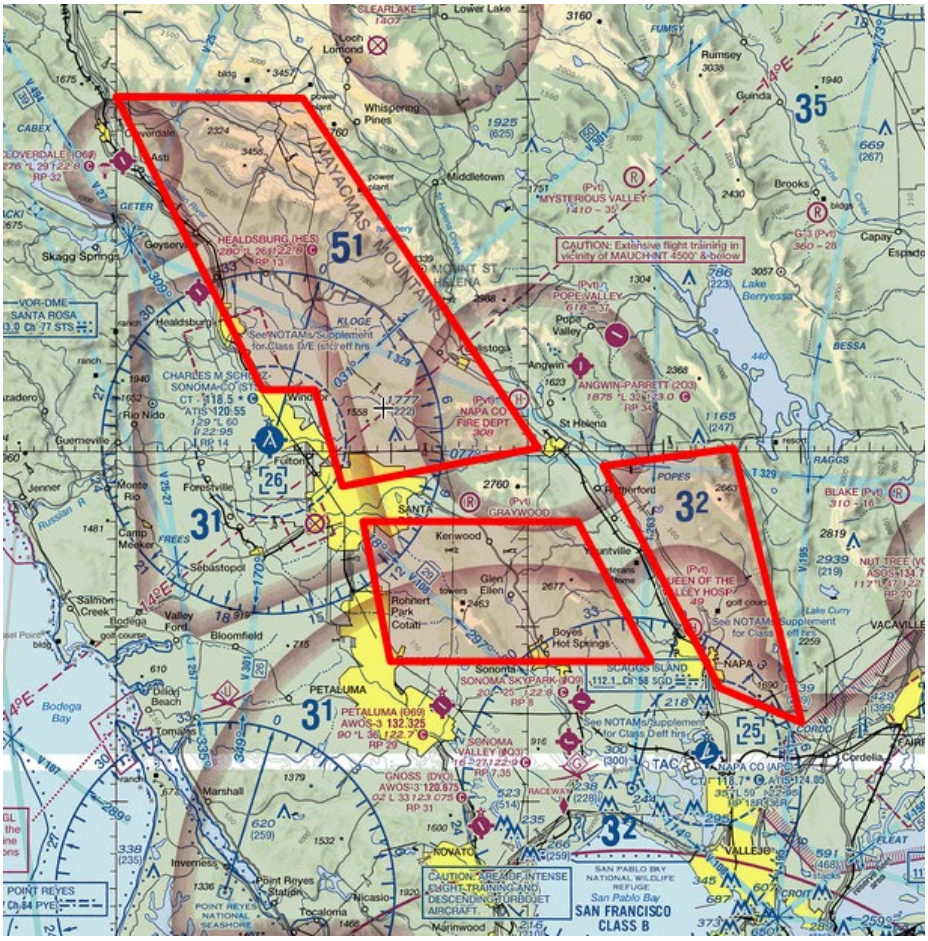


Figure 6-12: Example of Multiple Polygon TFRs That Allow for General Aviation Flight Corridors between TFRs and Minimal Impact to Local Airport Arrivals and Departures

6) MSL Altitude Only

- Altitude must be given to the FAA in feet above sea level, or MSL. A rule of thumb is that the top of the TFR is 3,000’ above the highest elevation on the incident or an altitude at or above the highest flying aircraft on the incident.
- Round that number up to the nearest whole thousand feet of MSL altitude so that it gives the TFR a hard top. Coordinate with the aerial supervisor or AOBD to make this decision.

7) Frequency

- Include VHF-AM Air-to-Air frequency in the TFR request.
- Monitor the TFR and keep the GACC Requesting Unit or the FAA notified if the frequency changes. Should the frequency change, the TFR will need to be cancelled and a new TFR will need to be issued.

8) Daytime or Daily Hours TFRs

- Since airspace can be a limited resource and because TFRs can have a significant impact on the efficient use of the national airspace, requesters of TFRs may wish to consider a Daily Hours TFR. Because a TFR is regulatory, the language of the restriction must be clearly defined.

- Do NOT use the words Daylight, Civil Twilight, Sunrise, or Sunset in the NOTAM description. These are not legal terms for the issuance of a regulatory FDC NOTAM. Use the actual hours of operation in Zulu time. Follow the NES or FNS instructions regarding how to request daily hours in the TFR.

9) FAA Procedures

   a. Nationally, GACCs (and some individual units) utilize the NES to input a draft TFR request to the appropriate ARTCC. This is done through a computer entry on a password protected website and a phone notification to the ARTCC.

   b. The ARTCC screens the NES TFR requests and completes an internal FAA checklist prior to forwarding the TFR request to the U.S. NOTAM Office. The U.S. NOTAM Office will approve the TFR and publish it via the U.S. NOTAM system. NES users must be pre-approved and obtain a certificate from the FAA in order to access the secured website that allows entry. Detailed instructions are available for authorized users. Contact agency aviation representative, a GACC Center Manager, or the National Airspace Program Manager for additional information.

   c. Verify the TFR is published as requested through NES by locating it on the U.S. NOTAM Website at http://tfr.faa.gov/tfr2/list.jsp. Document the NOTAM number on the resource order and TFR Request Form. If the approved TFR differs, contact the ARTCC to resolve the difference. It could be a typographical error that needs correction. Final approval, with any changes, will be passed to all affected personnel.

10) Maintaining and Modifying TFRs

   a. Maintain contact with FAA and DoD daily to ensure that TFR and requested deconfliction is still in effect.

   b. Coordinate modification with on-scene personnel and determine size or shape as the incident or project size changes. When the project has changed size or shape of airspace, the TFR NOTAM is cancelled and a new NOTAM is issued for the revised TFR. Modifications to a TFR requires coordination with the affected ARTCC, FSS, GACC, and military units. Follow the steps listed above and document on the resource order that the TFR has been replaced by a new TFR. Repeat, as necessary.

Be sure to: Follow agency procedures for contacting the FAA and the GACC (or ASCO) when a TFR frequency changes. Order a new TFR and ask that the ARTCC cancel the current TFR and issue a new TFR NOTAM with the correct frequency. Notify involved aircraft, agency, and neighboring agencies of frequency changes. Avoid changing TFR frequencies in the middle of an operational shift. Wait until night.

Note: TFRs are NOT used for prescribed fires or for Burned Area Emergency Rehabilitation (BAER) projects. These do not qualify as an ongoing disaster under 91.137 (a) 2. If there is an abundance of aircraft, they may warrant the issuance of an Airspace NOTAM (D).

Do not create a TFR to cover an initial attack area under the jurisdiction of an IMT, Area Command, Unified Command, or the local unit. A large TFR covering a potential initial attack area outside of the airspace currently being used by an existing incident would be an inappropriate use of a TFR for disaster response.

11) Modifications and Cancellations

a. When the incident no longer requires protected airspace, the TFR is cancelled. Modifications and cancellations to a TFR require coordination through the requesting GACC or ASCO who will contact the impacted ARTCCs. Be sure to notify all involved DoD units that the TFR has been cancelled.

b. If problems are encountered, document on a SAFECOM, and follow agency procedures. If airspace becomes unsafe, it is the responsibility of the individual who is aware of the hazard to ensure operations are temporarily suspended until the conflict is resolved. See Chapter 8 for further information.

Notification/Briefing Processes

As part of the deconfliction process, agency personnel need to notify both military and agency involved aircraft who may be in or near the identified TFR. Additional deconfliction information continues in Chapter 7.

1) Military Notifications of a TFR

A TFR is as restrictive to military flights as to any other nonparticipating aircraft. It is strongly recommended when TFRs are located near or in SUA and/or MTRs, notifications to affected military units be made prior to the request for a TFR from the FAA ARTCC. Military aircraft already airborne when a TFR is requested may not be in communication with the notified facilities. Do not assume the TFR is deconflicted without verification that military aircraft have been cleared from the affected airspace.

If MTRs are impacted, call the DoD Scheduling Activity, and determine the status of their routes (are they hot) and their schedule for the remainder of the day. Relay MTR status immediately to all incident air crews. Inform DoD of the intent to request TFR.

If a SUA such as a MOA, RA, WA, PA, CFA, or an AA is impacted, consult agreements between military and land management agency if such an agreement is in place. If no agreement is in place, consult with the appropriate ARTCC and/or Scheduling Agency for procedures to deconflict airspace.

Once the TFR or notification/deconfliction has been coordinated, the individual/office that's responsible coordinating for the TFR should check in with all impacted military units and provide updates on at least a daily, or more frequent, basis.

Information to provide includes but is not limited to:

- Agency flight operations including TFRs and other activity that may affect flight safety located in or near an MTR or SUA.
- Flights to and from an airtanker base that may not be inside the TFR, and the approximate load-and-return time interval.
- Routes of ingress and egress.
- Victor frequencies in use and the type and number of aircraft involved.

For non-time-critical operations, the military unit may schedule/ deconflict land management agency aircraft into the MTR/SUA area using normal scheduling procedures. For time-critical operations, military pilots are briefed or otherwise contacted. Ask the military to notify the requesting agency when all military aircraft have been confirmed clear of the area.

2) Agency Notifications of a TFR

It is imperative that agency personnel inform agency aircraft managers and operational bases of TFRs or other flight advisories. Any activity affecting airspace should be forwarded to agency pilots, managers, and/or ground personnel involved in air operations (i.e., smokejumper, airtanker, and helibases). Ensure that radio frequencies are known to enable communications over an incident.

If neighboring agencies or dispatch units are impacted, coordinate a TFR order with them. Share frequencies. Determine if requested TFR will affect current TFRs already in place. Adjoin boundaries using shared waypoints or combine if necessary. Do not overlap TFRs.

If an airport is impacted, notify the incident AOBD and airport manager. TFRs do not close an airport and VFR traffic is allowed inside a 91.137(a)(2) TFR to takeoff and land at an airport. Coordinate with AOBD and airport manager for ingress/egress or closure (Airport closures are not initiated by the agency or by dispatch, but by the airport manager who submits a NOTAM request to FAA.).

3) Briefings

Provide information to local and non-local initial attack and other participating aircraft on procedures for entering airspace (initial points of contact for entry, etc.). For further information, see Chapter 7.

Notification to local pilots and personnel is necessary to insure TFR, advisory NOTAMs, and other information affecting airspace is provided in real-time.

Morning and evening briefings should include current TFR areas, recent intrusions or potential conflicts, or other hazards and obstacles related to airspace. For detailed briefing information, consult Chapter 7.

Chapter 7 – Airspace Deconfliction

Introduction

Studies of mid-air collisions have revealed some interesting and surprising information. According to the NTSB and the AOPA Air Safety Institute, nearly all mid-air collisions occur in VFR conditions during daylight hours. Collisions most commonly occur in areas where multiple aircraft are operating in a relatively small area such as around airports, during emergency operations, and other areas with congested traffic. While multiple factors are often at play, it usually comes down to a failure to "see and avoid." Agency personnel can take proactive steps to reduce the risk of a mid-air collision.

The U.S. Air Force implemented a Mid-Air Collision Avoidance (MACA) program with the objective of preventing airspace conflicts through improved airspace coordination procedures. Agency personnel involved in airspace deconfliction employ similar MACA procedures that enhance communications and situational awareness among dispatchers, pilots, aircrews, Aerial Supervisors, base managers, and aviation managers. Several agency guides identify procedures and policies for federal firefighting agencies to follow which promote collision avoidance (e.g., *NWCG Standards for Aerial Supervision*, PMS 505, Mobilization Guides, etc.). These guides are referenced where appropriate.

Airspace Deconfliction

Airspace deconfliction is defined and discussed in this chapter. This section describes the processes used to reduce the risk of a mid-air collision, or TFR intrusion by sharing flight activity information regarding with DoD, general aviation, and other agency aviation programs. Deconfliction is performed for both emergency and non-emergency aviation activities.

Deconflicting airspace often involves a courtesy phone or radio call since the FAA does not routinely issue NOTAMS or notify local stakeholders when there are agency air operations in progress, except when a TFR is in place, or an airport is closed. A courtesy call can be critical for providing deconfliction information to an aerial supervisor (ATGS). For example, when an incident occurs on an MTR or in SUA. Dispatch can call either the FAA ARTCC, FSS, or the Military Scheduling Activity to see if the route is active (hot). When calling the military, a dispatcher can usually find out not only if the route is hot, but how many aircraft are scheduled on the route and the expected block of time they will be using the route. When relayed to the field, this information can be crucial in preventing a mid-air collision. Conversely, it is important to notify DoD when aircraft will be responding to a fire, especially if a TFR request will be placed with the ARTCC. Deconflicting airspace should also occur for agency non-emergency resource management missions. DoD may or may not choose to adjust the time or altitude of operations planned for the airspace involved to reduce the risk of a mid-air collision. "See and avoid" principles will always apply.

Airspace Readiness and Training

A critical component of an airspace program is readiness and training. Airspace coordination is severely hampered by incorrect phone numbers, and out-of-date maps. The following is a list of seven steps to assist airspace coordination preparedness.

Seven Steps to Airspace Preparedness

1. Maps updated and available?
    - Sectional Aeronautical Charts
    - Aircraft Hazard Maps
2. Publications current and accessible?
    - AP1/B book and charts
    - FAR/AIM
    - Chart supplements
    - AP1/A Handbook
    - *Interagency Airspace Coordination Guide*
3. Current contact phone lists?
    - Scheduling agencies/activities for SUA/MTRs
    - FAA contacts
4. Airspace identified for geographical area?
5. Airspace agreements established and current?
6. Forms accessible?
    - Current TFR Request Form
    - Checklists
    - Temporary Tower Request Form
7. Appropriate agency personnel trained?
    - Able to plot bearing/distance
    - Latitude/Longitude mapping
    - Airspace coordination

Additional Airspace Deconfliction Opportunities

Many opportunities exist to create an airspace coordination program prior to the need to deconflict airspace. Relationships should be established between dispatch, the FAA and DoD personnel who interact in airspace coordination roles. The following outreach possibilities enhance airspace coordination in a positive and proactive manner.

1) Site Visits

   Site visits between dispatch organizations and DoD Scheduling Activity offices, Scheduling Agencies, and ARTCCs are invaluable in understanding FAA and DoD airspace deconfliction procedures. Likewise, inviting DoD and FAA personnel to a dispatch center provides for cross training and increased understanding of agency procedures.

   Fly-ins or air shows are opportunities for agency personnel to share information about airspace coordination procedures. This is an outstanding method of reaching out to GA pilots to discuss wildland fire-related TFR areas.

2) Airspace Agreements

   As discussed in Chapter 12, provide a useful tool for standardization of interagency airspace coordination procedures.

3) DoD Airspace Deconfliction

   NGA publishes DoD FLIP which consists of various books and charts (reference Chapter 5). The AP/1 contains direction to DoD flight crews regarding forest fire season. The following quote is from the AP/1, Chapter 3:

FLIGHT HAZARDS

FOREST FIRE SEASON–Many MTRs traverse areas of mountainous forest and range lands. Flight crews must be alert for fire suppression activities using aircraft during the fire season. In many cases a NOTAM designating a TFR area will be in effect for such areas when a fire exists. All aircrews should be extremely alert for such areas whether designated or not and avoid such areas by at least 5 NM.

Typical fire seasons for various regions are as follows:

NE U.S.–Mar, Apr, May

SE U.S.–Mar, Apr, May, Sept, Oct, Nov

ARIZONA/NEW MEXICO–April, May, June, July, Sept, Oct, Nov

CALIFORNIA–May, June, July, Aug, Sept, Oct, Nov, Dec

COLORADO/WYOMING–May, June, July, Aug

N. DAKOTA–May, June, July, Aug

UTAH/NEVADA/IDAHO–June, July, Aug, Sept

MONTANA–June, July, Aug, Sept

OREGON/WASHINGTON–June, July, Aug, Sept, Oct

4) Airspace Deconfliction Tools

a. Airspace Briefings

Standard briefings at all airbases (both on and off incident), and dispatch offices should include airspace information. Aircraft arriving from other geographic areas should be briefed on airspace issues in a face-to-face setting (or at least by radio or phone when a ground briefing is not possible), prior to taking an initial operational assignment. Feedback on the day's operation should be obtained from aerial firefighters, pilots, and dispatchers at the end of each operational day thereafter. Corrective actions for problems identified during debriefings should be taken prior to the next operational period. The following briefing components are recommended to provide comprehensive airspace information to pilots and aircrews. These are intended to augment, but not replace, standard helibase, tanker base, or incident air operations briefings.

- General local, state/regional, and national airspace situation to include a review of TFR maps/NOTAMs, and procedures (location, dimensions, altitudes, frequencies, etc.)
    - To download a TFR shapefile go to the FAA's website at https://tfr.faa.gov/tfr2/list.html, click on the NOTAM number, then click on "download shapefiles."
- Describe the impacts of operations or TFRs on military or other flight activities.
- Review problems or conflicts encountered to date, and their resolution.
- Safety issues, airspace alerts, and known or suspected UAS activity.
- Exchange contact information for Incident Management Team Air Operations personnel, Airspace Coordinator, Aircraft Dispatchers, local agency aviation managers, etc.
- Known hazards (e.g., logging cables, transmission or other suspended lines, other aircraft operations, etc.)

b. Distribution

Awareness of airspace coordination and communications information is critical to the DoD, FAA, agency personnel, and pilots of participating and nonparticipating aircraft. Information destinations include but are not limited to:

- Incident Air Attack and airtanker Bases, helibases, etc.
- Unit/Zone Dispatch Centers and GACC Aircraft Desk
- Incident AOBDs and aviation staff
- Neighboring agencies
- Agency Aviation Safety Managers/Officers
- FSS, ARTCCs, and DoD–SUA Scheduling Agencies, MTR Scheduling Activity

Airspace Coordinators assigned to complex incidents should refer to Chapter 2 for an outline of reporting responsibilities.

Boundary Issues

Boundary areas with neighboring dispatch centers or cooperator agencies require increased coordination due to the possibility of two or more organizations responding to the same incident or to separate fires in close proximity. Simultaneous, uncoordinated aviation operations within the same airspace place aircraft and crews at extreme risk. It is crucial to identify such boundaries, initial attack zones, and develop/enforce immediate and ongoing notification protocols for effective deconfliction. Communication protocols are needed in a 10 NM wide boundary airspace corridor between adjoining dispatch center or agency/cooperator boundaries. Information must be exchanged and updated between dispatch centers for all incident and non-fire aviation activities that occur in the boundary zone to include reconnaissance, resource management flights, helicopter logging, known end-product aviation projects, UAS missions, etc.

If available, an aerial supervisor should be dispatched to ensure FTA protocols are followed when aircraft from two or more adjoining agencies/cooperators are being committed to an incident in a common boundary area. Agency aircraft will establish contact on the assigned air-to-air frequency or Air Guard. Pilots should perform a high-level recon prior to initiating low-level flight operations and practice "see and avoid."

Coordination between dispatch centers is critical for relaying assigned frequencies, and the aircraft type, call sign, and Estimated Time of Arrival (ETA) of each responding aircraft. TFRs within or in close proximity to boundaries should also be coordinated with timely information shared between the responsible dispatch offices. TFR boundaries may need to overlap into adjoining unit airspace in order to provide a safe operating environment. Procedures for establishing boundary TFRs must be discussed between dispatch centers and unit aviation managers prior to each fire season, and agreed-upon notification plans must be implemented without hesitation when the need arises.

Airspace Operating Guidelines

Incident aviation operations are often conducted under extremely adverse flight conditions. Congested areas, reduced visibility, adverse weather, and mountainous terrain all add to the complexity of operations.

Situations and complexities dictate the level of supervision required to safely and effectively conduct aerial operations. Aerial supervision may be provided by ATGS, lead plane, ASM, or HLCO (Helicopter Coordinator). Dispatchers, Airtanker Base Managers, and Aerial Supervisors ensure that the policies and recommendations found in the *NWCG Standards for Aerial Supervision*, PMS 505 and Dispatch Mobilization Guides are applied. The *NWCG Standards for Aerial Supervision*, PMS 505 specifically outlines procedures for ingress and egress to/from a TFR by assigned aircraft. The following addresses aircraft NOT assigned to the incident:

1) Unassigned Aircraft Are Flying Near, Transiting, or Entering Incident Airspace.

   This situation is a source of many airspace conflicts. Pilots and aircrew members of non-incident aircraft need to be aware of potential conflicts. Dispatch offices can provide information regarding TFRs and incident aviation activity in the area of the nonparticipating aircraft. Numerous aviation organizations such as the FAA Safety Team (FAASTeam), EAA, AOPA, etc. have educational courses and briefings for pilots regarding TFRs and operations near fire incidents. Although the risk and consequences of a mid-air collision are the same, there are distinct legal differences between flying near incidents with a TFR and those that do not have a TFR in place. In all cases, pilots are required to avoid careless and reckless operations (14 CFR 91.13).

a. Incidents with a TFR

It is important that pilots and flight managers of agency aircraft not assigned to the incident understand they are considered "nonparticipating" aircraft under FAR 91.137 (a.) 2. They do not have authorized access into a TFR. They fall under the same requirements as GA and commercial aircraft. Pilots of nonparticipating aircraft are responsible for being aware of and remaining clear of TFRs. They may transit around the outside perimeter or cross over above the ceiling altitude published in the TFR NOTAM. Unauthorized intrusions may result in FAA enforcement action. All intrusions should be immediately reported to dispatch in real-time. Dispatchers should then immediately notify the ARTCC. ATC may be able to identify and track the intruding aircraft to a point of landing. All TFR intrusions should be documented on a SAFECOM.

b. Incidents without a TFR

For aircraft not assigned to an incident, a basic aviation safety procedure is for an agency pilot to avoid the incident airspace or avoid transiting through until radio contact is established with the aerial supervisor or other incident aircraft (when an aerial supervisor is not present). Pilots can acquire the correct air-to-air frequency and call sign of the aerial supervisor by contacting dispatch. General aviation and transiting commercial pilots will normally not know the assigned frequency if there is no TFR NOTAM published that provides this information.

2) Ingress and Egress of Incident Aircraft Flying Near, Transiting, or Entering Incident Airspace

Standard procedures should be followed as specified in *NWCG Standards for Aerial Supervision*, PMS 505. An aerial supervisor assigned to the incident has the responsibility for establishing and communicating ingress and egress points for responding aircraft.

a. Fire Traffic Area

The FTA was developed by aerial firefighting personnel to provide a standardized initial attack airspace structure and protocol to enhance traffic separation over wildfires or other incidents. The structure and communication requirements are patterned after Class D airspace with some specific differences. It emphasizes established communications, procedures to ensure clearances are received, understood, and followed. An aircraft should NOT enter the FTA until it receives a clearance.

Agency personnel involved with an FTA should be familiar with the *NWCG Standards for Aerial Supervision*, PMS 505, which provides detailed information about ingress, egress, and operating procedures. The FTA is a communication protocol for firefighting agencies. It does not apply to other aircraft that have legal access into a TFR by the FAA per 14 CFR 91.137 (c.). The FTA should not be confused with a TFR, which is a legal restriction established by the FAA to restrict aviation traffic. The FTA is a communication tool establishing protocol for responding firefighting agencies.

Participating aircraft must adhere to TFR regulations as established by the FAA. If, for example, the boundary of a TFR polygon exceeds the 12-mile initial contact ring, clearance will still be required in order to enter the TFR. If the TFR boundary is within the 12-mile ring, proceed with standard FTA communication procedures.

The standard FTA utilizes a minimum 5 NM radius from the incident latitude and longitude, although a radius greater than 5 NM may be utilized if needed by the incident. The 3,000 AGL minimum FTA ceiling may also vary if additional vertical room is needed by the aerial supervisor to accommodate the operational requirements of participating aircraft.

There is an initial Contact ring established as a 12 NM radius from the designated center point, and a 7 NM No Communication Ring (NOCOM) ring where aircraft must hold until contact is established. If no communications are established, an aircraft may not penetrate the FTA any further. The NOCOM holding options include a 7 NM option or a quadrant option.

b. Other Airspace Requirement

The FTA concept requires arriving aircraft to be at the altitude assigned by the ATGS, ASM, or Lead Plane prior to entering the FTA. Large incidents will often have other specific airspace requirements, and TFRs that exceed the dimensions of a standard FTA. In this case, Initial Points (IPs) are used in conjunction with transition routes to and from the incident. An IP is a physical location based on geographic or coordinate reference such as a latitude/longitude. Unless otherwise directed, arriving aircraft will reference the IP for initial communications and NOCOM procedures.

c. Egress from the Incident

The aerial supervisor may establish flight routes and/or reporting points for egress from the incident. These points and routes may become necessary due to poor visibility, proximity to adjacent incidents, heavy air traffic, or for other reasons.

d. Flight Routes to/from an Incident (Outside an FTA)

Routes should be implemented when warranted by conditions such as poor visibility, or a complex of multiple incidents with a high volume of traffic within a single TFR, or when there are multiple adjoining TFRs. These routes should be communicated to dispatch and/or the Airspace Coordinator and depicted on GIS maps disseminated to all assigned pilots and flight crews. Local FAA/ATC or Temporary Tower personnel should likewise be advised.

e. Aviation Operations in Congested Areas

This can be a confusing term. It is often referred to as Congested Airspace which has no formal airspace definition by the FAA. A congested “area” is an operational area of airspace which requires additional precautions and procedures for conducting low-level flight operations. Under 14 CFR 91.119, the FAA establishes the minimum safe altitudes for operating aircraft over “a congested area of a city, town, or settlement, or over any open air assembly of persons.”

U.S. Forest Service – Operations on national forest lands and other agency lands protected by the USFS under cooperative fire protection agreements require that all aircraft conduct air operations under the FAA Grant of Exemption No. 392 from 14 CFR 91.119 (Minimum Safe Altitudes).

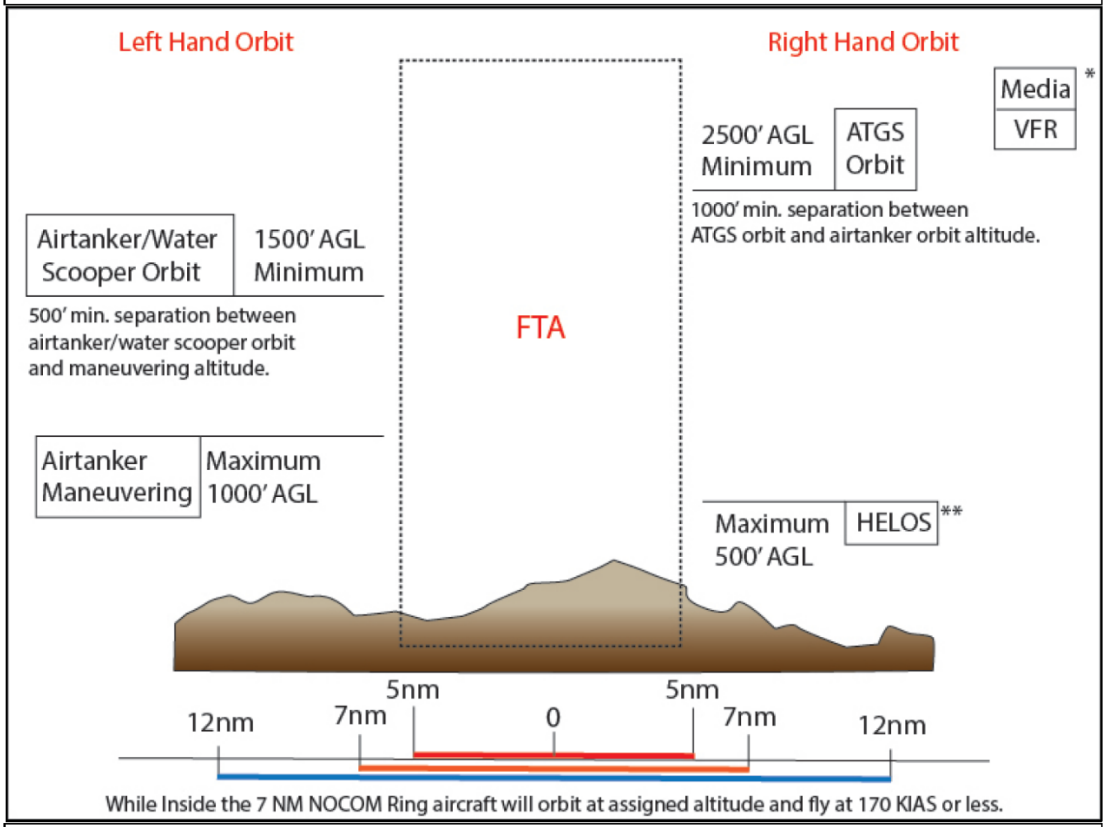
Other agency operations–aircraft flying on incidents under other agency jurisdictions should consult their agency policies and 14 CFR 137.

NWCG Fire Traffic Area (FTA)

***NWCG Standards for Aerial Supervision*, PMS 505,**
https://www.nwcg.gov/publications/505
Clearance is required to enter the FTA

Initial Radio Contact: 12 nm on assigned air tactical frequency.
No Radio Contact: Hold a minimum of 7 nm from the incident.

Note: Airtanker maneuvering altitude determines minimum airtanker and ATGS orbit altitudes. Assigned altitudes may be higher and will be stated as MSL.



* Media and IAA Aircraft: Maintain VFR separation above highest incident aircraft or at the altitude assigned by the controlling aircraft.

** Helicopters: Fly assigned altitudes, orbits, and routes.

Airtanker Base	Air Guard	Air to Air	National Flight Following
As Assigned	168.625 Tx Tone 110.9	As Assigned	168.650 Tone 110.9 TX and RX

PMS 505d (07/22) **1** of **2**

Figure 7-1: Fire Traffic Area Depiction

Chapter 8 – Airspace Conflicts

Introduction

Federal Aviation Regulations establish a safe environment for all aircraft operating within the NAS. Conflicts often occur in which aircraft are observed operating outside of established regulations. The FAA investigates, collects, and analyzes aircraft incident reports in order to provide a source of accident prevention information as required by Federal Aviation Administration Orders. (FAAO 8020.11C, Aircraft Accident and Incident Notification, Investigation, and Reporting).

Land management agencies, as users of the NAS, have a responsibility to identify and report incidents to assist in the resolution of airspace conflicts. When a conflict or incident occurs, it may indicate a significant aviation safety hazard. Safety incidents related to Airspace should be reported to the local agency aviation manager or Airspace Coordinator immediately, followed by submission of a SAFECOM. An agency national or regional aviation safety manager may determine whether the incident warrants official submission to the FAA for investigation.

Defining Situations of Unsafe Aircraft Operations

Near Mid-Air Collision (NMAC)

A Near Mid-Air Collision is defined by the FAA (FAA Orders JO 7210.632) as "an incident associated with the operation of an aircraft in which the possibility of collision has been reported by one of the involved flight crew *and* results in recorded proximity of less than 500' vertical and 0.5 NMs lateral to another aircraft."

Figure 8-1: Example of a Near Mid-Air

In addition, the AIM states that, "a near mid-air collision is defined as an incident associated with the operation of an aircraft in which a possibility of collision occurs as a result of proximity **less than 500' to another aircraft**, or a report is received from a pilot or a flight crew member stating that a **collision hazard existed** between two or more aircraft."

The Air Force refers to their Near Mid-Air incidents as Hazardous Air Traffic Reports (HATRs); the Army uses Operational Hazard Reports (OHRs). The Navy and Marine Corps facilities use the term NMAC.

Pilot Deviation (PD)

A PD as defined in FAA Order 8020.11C is an incident in which pilot action results in violation of a Federal Aviation Regulation or a North American Aerospace Defense (Command ADIZ) tolerance.

The following are types of incidents that are treated by the FAA as a PD:

1) Operation of an aircraft in a careless or reckless manner (14 CFR 91.13).
2) Airplanes flying below 500' AGL unless in sparsely populated areas or over water (14 CFR 91.119).
3) TFR intrusions (14 CFR 91.137), which are occurrences of nonparticipating aircraft entering a TFR without permission (with exceptions for law enforcement flights, airport traffic, IFR traffic, and accredited media). For further information, see Chapter 6.
4) Flight operations in Special Use Airspace [RA and PA] that is designated in Part 73 (14 CFR 91.133).
5) Noncompliance with standard or acceptable airport operations (14 CFR 91.127).
6) Failure to comply with an ATC clearance and/or instructions.
7) Military Aircraft not operating within the parameters of their SUA, e.g., MOAs, RAs, or MTRs (14 CFR 91.117 Aircraft Speed, FAA Orders 7610.4T Special Operations).
8) Although not a report to the FAA, noncompliance with joint-use scheduling as outlined in Memorandums of Understanding (MOUs), Letters of Agreement (LOAs), or Operations Plans should be reported to the appropriate Military Representatives (MilReps) or other coordinating military representative(s).

An NMAC is not necessarily a Pilot Deviation. However, some incidents, such as a TFR intrusion where an NMAC occurred, may require that both types of reports be filed.

Conflicts with Unmanned Aircraft Systems (UAS)

An UAS or “drone”) is considered an aircraft by the FAA. When there is an intrusion into a TFR and/or careless or reckless flying is observed; please follow your agency UAS procedures and report it to the FAA ARTCC as soon as possible. The FAA must adhere to the following as per FAAO 7610.4: *"Reporting Unauthorized or Suspicious UAS activity. Air Traffic Control (ARTCC aka ATC) must notify the Domestic Events Network (DEN) Air Traffic Security Coordinator (ATSC) of any reported or observed unauthorized UAS activity."*

In addition to immediately reporting all UAS TFR intrusions (or careless and reckless flying) to the appropriate ARTCC, agency aviation managers should also document the event on a SAFECOM for internal reporting and follow-up purposes.

Initial Response/Action

The initial report of an airspace conflict should be reported immediately to the FAA and/or the local dispatch office or GACC (as appropriate). The Airspace Conflict Action Checklist (Figure 8-3) is designed to assist in gathering pertinent information for the FAA, the unit aviation manager/officer, and an Airspace Coordinator, if one is assigned.

Upon receipt of an initial airspace conflict report the Aircraft Dispatcher, Airspace Coordinator, or Unit Aviation Officer should immediately contact the FAA ARTCC/ TRACON and request a positive identification of the aircraft involved. Reporting should occur within 15 minutes of the incident. If the occurrence involves a military aircraft and there is potential for a recurrence, immediately contact the Military Airspace Scheduling Activity responsible for flight in the area of operations. If necessary, cease all agency aviation activities until the safety issue is resolved.

FAA Reporting

NMAC Reports

An FAA NMAC report should be submitted for all incidents that meet the definition. When operating without ATC oversight it is the responsibility of the pilot and/or flight crew to notify the nearest air traffic facility on the ATC frequency while airborne, or by phone immediately after landing. When an air traffic controller observes a NMAC, they will initiate the NMAC report.

The primary purpose of the NMAC Reporting Program is to provide information that will enhance the safety and efficiency of the NAS. Data obtained from NMAC reports are used by the FAA to improve the quality of FAA services to users, and to develop programs, policies, and procedures aimed at the reduction of NMAC occurrences.

All NMAC reports are thoroughly investigated by FSDOs in coordination with ATC facilities. Data from these investigations are transmitted to FAA Headquarters in Washington, D.C., where they are compiled and analyzed to recommend safety program improvements.

Notification should be made immediately (or as soon as possible) after any unsafe incident occurs. Whenever possible, the written report should be received by the responsible FSDO within 15 (calendar) days to ensure all FAA flight records are available. Normally ATC records used to identify aircraft (e.g., flight plans, flight strips, radar, and radio tapes) are only kept for 15 days. Late submission of a report may result in limiting the FSDOs ability to complete the investigation.

Pilot Deviation Reports

A FAA Pilot Deviation report should be submitted for all incidents that meet the definition. Any person using information from ground and/or airborne observations may make reports of unsafe operations or deviations from the Federal Aviation Regulations. Items to be reported are as follows:

1. Date, time (UTC), location, and altitude of the occurrence.
2. Location of the incident in relation to the nearest navigation fix or ATC facility.
3. Identification and type of reporting aircraft, destination, name, and home base of pilot.
4. Identification and type of other aircraft. If known, include aircraft departure, or arrival point and name and home base of pilot.
5. Type of flight plans and station altimeter setting used.
6. Detailed weather conditions at altitude or flight level.
7. Approximate course headings of aircraft involved, and if aircraft was in climb or descent.
8. Reported separation in distance at first sighting, proximity at closest point horizontally and vertically, and length of time in sight prior to evasive action.
9. Degree of evasive action taken, if any (by either aircraft, if possible).
10. Injuries, if any.

FAA Direction Regarding UAS Reporting (FAA Joint Order 7200.23)

All (FAA) employees must ensure that all known unauthorized UAS activities, through either direct involvement, or observation are documented. These occurrences or conditions must be reported using the processes contained within JO 7210.632 and this order, Air Traffic Organization (ATO) Occurrence Reporting or JO 7200.20, Voluntary Safety Reporting Program (VSRP). Submission of a VSRP report satisfies non-management employees' requirement to report according to these directives except when the employee providing air traffic services determines that pilot actions affected national security or the safety of operations. When such a determination is made, UAS activities must also be reported in the Comprehensive Electronic Data Analysis and Reporting (CEDAR) as a Mandatory Occurrence Reporting (MOR) in accordance with FAA JO 7210.632 and this notice.

Reporting unauthorized or suspicious UAS activity. **ATC must notify the DEN ATSC of any reported or observed unauthorized UAS activity (in accordance with FAAO 7610.4, Special Operations) and document the incident.** Additionally, if UAS activity is creating a hazard to air traffic, facilities may contact their local law enforcement. Ask the local law enforcement to inform the UAS operator of the hazard they are creating to air traffic and to cease the operation. If local law enforcement can obtain the operator's name and address, include this information in the MOR to support possible enforcement action. Any authorized UAS operation that is conducted in an unsafe manner must be terminated. Report the noncompliance UAS activity to the DEN.

Aircraft Identification

Usually, the first step of reporting an unsafe aircraft situation is to identify the involved aircraft. The FAA and/or DoD, as applicable, need a positive identification of the aircraft involved to perform a complete investigation of an airspace incident. Although the aircraft registration number is the best method of obtaining positive identification, often the aircraft is moving too fast to read the identification numbers. Military aircraft normally have some markings but generally, the speeds flown by jets will make these almost impossible to read.

Document as much information as available (e.g., direction of flight, altitude, etc.) and relay as soon as possible to the agency dispatcher or aviation manager. The more information provided by the observer, the greater the likelihood that identification can be obtained**,** resulting in a successful investigation.

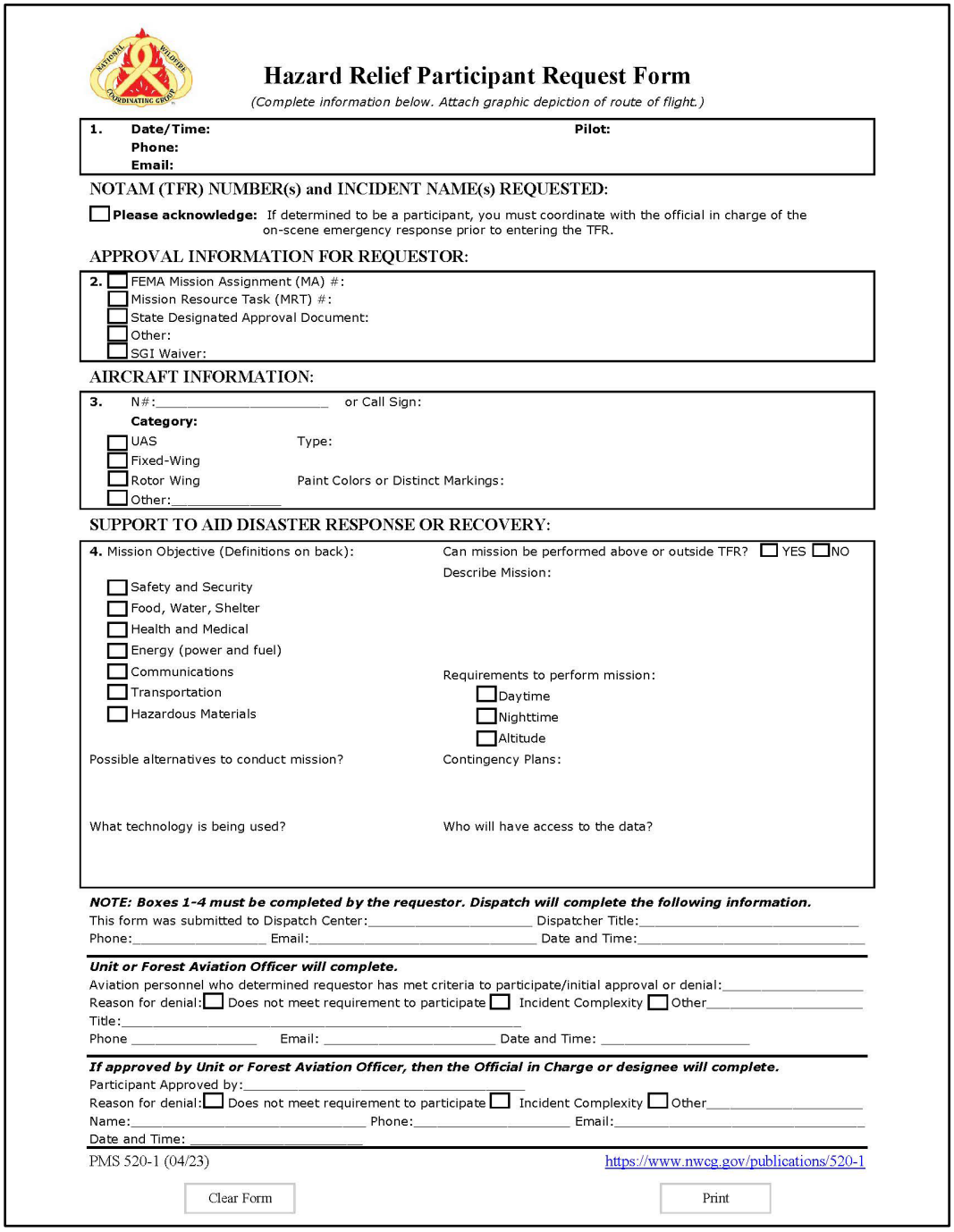
Use of an aircraft profile identification guide (online or published) can assist in swiftly identifying the type of aircraft.

Aircraft Incident Observation Checklist

The Near Mid-Air Collision Checklist (Figure 8-3) is provided as an aid to agency personnel in describing an aircraft so that it may be identified. It can be used by an observer to fill in information, or by off-site personnel to ask questions and develop a full description to enhance their SAFECOM.

Incorrect aircraft identification may hamper the FAA or military's ability to determine the actual aircraft involved in the incident. Unless this identification is without doubt, encourage reporting personnel to provide generic descriptions to substitute or supplement the checklist information.

Note: Sometimes airspace SAFECOMs are not effective in their brevity. For example, stating "A FWAC intruded into the TFR on 3/28" is less effective than saying "A high-wing fixed-wing aviator craft (FWAC) painted red and white intruded into the TFR at 1528. It was headed northwest at approximately 2,000 MSL and interfered with airtanker operations. No contact was made despite numerous efforts. We are looking at the local airport to see if the aircraft landed there." Sometimes airspace SAFECOMS state –"This is the sixth intrusion in two days!"– yet SAFECOMS documenting the first five intrusions have not been filed. Try to document as much information as available.



Hazard Relief Participant Request Form

(Complete information below. Attach graphic depiction of route of flight.)

1. Date/Time: **Pilot:**
Phone:
Email:

NOTAM (TFR) NUMBER(s) and INCIDENT NAME(s) REQUESTED:

☐ **Please acknowledge:** If determined to be a participant, you must coordinate with the official in charge of the on-scene emergency response prior to entering the TFR.

APPROVAL INFORMATION FOR REQUESTOR:

2. ☐ FEMA Mission Assignment (MA) #:
☐ Mission Resource Task (MRT) #:
☐ State Designated Approval Document:
☐ Other:
☐ SGI Waiver:

AIRCRAFT INFORMATION:

3. N#:_____ or Call Sign:
Category:
☐ UAS Type:
☐ Fixed-Wing
☐ Rotor Wing Paint Colors or Distinct Markings:
☐ Other:_____

SUPPORT TO AID DISASTER RESPONSE OR RECOVERY:

4. Mission Objective (Definitions on back):
☐ Safety and Security
☐ Food, Water, Shelter
☐ Health and Medical
☐ Energy (power and fuel)
☐ Communications
☐ Transportation
☐ Hazardous Materials

Can mission be performed above or outside TFR? ☐ YES ☐ NO
Describe Mission:

Requirements to perform mission:
☐ Daytime
☐ Nighttime
☐ Altitude

Possible alternatives to conduct mission?

Contingency Plans:

What technology is being used?

Who will have access to the data?

NOTE: Boxes 1-4 must be completed by the requestor. Dispatch will complete the following information.
This form was submitted to Dispatch Center:_____ Dispatcher Title:_____
Phone:_____ Email:_____ Date and Time:_____

Unit or Forest Aviation Officer will complete.
Aviation personnel who determined requestor has met criteria to participate/initial approval or denial:_____
Reason for denial: ☐ Does not meet requirement to participate ☐ Incident Complexity ☐ Other_____
Title:_____
Phone _____ Email: _____ Date and Time: _____

If approved by Unit or Forest Aviation Officer, then the Official in Charge or designee will complete.
Participant Approved by:_____
Reason for denial: ☐ Does not meet requirement to participate ☐ Incident Complexity ☐ Other_____
Name:_____ Phone:_____ Email:_____
Date and Time: _____

PMS 520-1 (04/23) https://www.nwcg.gov/publications/520-1

Clear Form Print

Figure 2 Hazard Relief Participant Request Form

Radar Identification

Real-time aircraft identification from FAA radar facilities is possible only if the occurrence is reported immediately, and the FAA is tracking the aircraft. The dispatcher/aviation manager or Airspace Coordinator should contact the local ARTCC or Terminal Radar Approach Control (TRACON) and explain the nature of the incident, along with all available information from the observation report. Request identification of the aircraft involved and include this information in the written report.

(**Note**: In some areas, ARTCC radar coverage may be limited to higher altitudes and TRACONs should be contacted for information on low altitude traffic.) Even if the conflict is immediately reported, the standard conflict reporting processes to the FSDO should be followed. The report should be processed through the FSDO by the agency aviation safety manager.

Agency Reporting and Documentation

All airspace issues: NMAC, intrusion, conflict, congestion, route deviations, etc. should be reported in the agency SAFECOM system. The report and any associated documentation should be sent to the local Unit Aviation Officer or agency aviation safety manager. SAFECOM reports are NOT to be sent to the FAA to avoid their potential use for punitive purposes. State/regional aviation managers should submit reports of airspace conflicts to the local FAA FSDO in another appropriate format.

If a radar documentation of flight is required, the agency aviation safety manager will need to submit a Freedom of Information Act (FOIA) request as soon as possible to the FAA Regional Headquarters' Quality Assurance Office, along with a request for FAA to conduct an investigation. Make it known that follow-up and feedback is desired on the progress and eventual outcome of the FAA's investigation.

FAA Investigation

The FAA office responsible for the investigation and reporting of NMACs and Pilot Deviations will be the FSDO in whose area the incident occurred. FAA Order 8020.11 defines FAA's investigation responsibilities. The FSDO investigator will categorize NMAC cases as one of the following:

1) Critical–a situation in which collision avoidance was due to chance rather than a pilot's actions. Less than 100' of aircraft separation is considered critical.
2) Potential–a situation that would probably have resulted in a collision if no action had been taken by either pilot. Less than 500' of aircraft separation is usually required in this case.
3) No hazard–a situation in which direction and altitude have made a mid-air collision improbable, regardless of evasive actions (FAA Order 8020.11).

The FAA, in response to its investigation, may choose to interview the pilot, crew members, on-scene personnel, dispatcher, etc. Documentation of the incident is essential to the investigation.

Follow-Up

The need for follow through on all airspace issues is critical to both investigation and resolution of occurrences and the prevention of future situations. If military aircraft were involved, contact the Military Airspace Scheduling Activity regarding actions taken with the ARTCC and FSDO. Contact should also be made with the appropriate Military Representative (MILREP) at the FAA Service Center. FAA may contact the agency national or state/regional aviation safety manager, and/or Airspace Coordinators for further information. Aviation managers should acquire a final report from the FSDO.

AIRSPACE CONFLICTS ACTION CHECKLIST (ALWAYS FOLLOW AGENCY PROCEDURES)
SUGGESTED STEPS TO BE TAKEN IF: **THERE IS AN INTRUSION WITHIN A TFR**

- Have contact provide as much information as possible (Use Aircraft Observation Report) for more information.
- Contact local ARTCC and report intrusion to Area Manager immediately. Fax Aircraft Observation Report or Intrusion Report to FAA.
- If DoD aircraft are involved, contact the following: If a MTR is located within the TFR: Contact the Scheduling Activity listed in the AP1/B (or use CAHIS/IAMS for phone number) If a MOU/SUA is located within the TFR: Contact the Scheduling Authority (Consult Sectional for identification of Scheduling Authority–many times it is the local ARTCC) If you do not have access to an AP1/B, CAHIS/IAMs/CAN or a Sectional, contact your local ARTCC for assistance in identifying the scheduling office.
- Explain the situation to both the FAA and, if necessary, DoD. Provide NOTAM information for TFR. Ask if any further flights are scheduled within the area. Discuss safety issues and renew efforts to deconflict airspace. Document all conversations.
- If safety is compromised, shut down operations until airspace is safe to work within. Do NOT use intimidation or risky flying to try to encourage aircraft to leave the area. Pull out of the area if safety is compromised.
- Obtain documentation and file SAFECOMs.

THERE IS A NEAR MID-AIR COLLISION (NMAC) INVOLVING: NOTE: FOR ALL NMACs REFER PILOT TO FAA IF THEY WISH TO FILE A NMAC REPORT.

AGENCY AIRCRAFT AND AGENCY AIRCRAFT

- Shut down operations if safety is compromised.
- Obtain documentation and file SAFECOM. Provide additional witness reports, radio logs, etc., if needed.
- Discuss airspace procedures, TFRs, etc., during pilots' briefings (and debriefings). Be sure that TFR information is shared with local agencies and other cooperating agencies involved in incident.

AGENCYAIRCRAFT AND DoD AIRCRAFT

- Obtain as much information as possible.
- Contact Local ARTCC and report incident to Area Manager. Fax documentation to FAA. Discuss contacting schedulers for MTRs, SUAs, and MOAs.
- Contact Scheduling Activities (MTRs/SRs) and Scheduling Authorities (SUAs/MOAs) and provide information about intrusion. Inquire about scheduling activity. Discuss deconfliction request and TFR. Consider also contacting Air Force regarding local LATNs.
- File SAFECOM through agency procedures.
- Notify MILRep at FAA Regional Headquarters. MILReps will investigate all DoD related TFR intrusions or Near Mid-Air Collisions. Provide complete documentation.
- Courtesy copy to FAA FSDO. FSDO will refer investigation to DoD.

AGENCY AIRCRAFT AND GENERAL AVIATION AIRCRAFT

- Obtain as much information as possible.
- Contact ARTCC (Area Manager) with information. Ask if the FAA can identify the aircraft on their radar scopes.
- File SAFECOM through agency procedures.
- Provide information to FAA FSDA. FSDO will assign investigator to follow through.
- Check local airports to see if aircraft can be identified. Do not "educate" the pilot--the FAA will handle that.

AGENCY AIRCRAFT AND BIRDS OR WILDLIFE

- File SAFECOM
- See Chapter 4 and file Bird report with FAA.

Figure 8-3: Airspace Conflict Action Checklist

Voluntary NASA Aviation Safety Reporting System

The FAA has established a voluntary Aviation Safety Reporting System (ASRS) designed to stimulate the free and unrestricted flow of information concerning deficiencies and discrepancies in the aviation system. This program utilizes NASA to act as an independent third party to receive and analyze reports submitted under the program. This program is described in Advisory Circular AC 00-46E, Aviation Safety Reporting Program. This is a positive program intended to ensure the safest possible system by identifying and correcting unsafe conditions before they lead to accidents. The primary objective of the program is to obtain information to evaluate and enhance the safety and efficiency of the present system.

This cooperative safety reporting program invites pilots, controllers, flight attendants, maintenance personnel, other users of the airspace system, or any other person, to file written reports of actual or potential discrepancies and deficiencies involving the safety of aviation operations.

The operations covered by the program include departure, en route, approach, and landing operations and procedures, ATC procedures and equipment, crew and ATC communications, aircraft cabin operations, aircraft movement on the airport, Near Mid-Air Collisions, aircraft maintenance and record keeping, and airport conditions, or services.

The report should give the date, time, location, persons, and aircraft involved (if applicable), nature of the event, and all pertinent details.

To ensure receipt of this information, the program provides for the waiver of certain disciplinary actions against persons, including pilots and air traffic controllers, who file timely written reports concerning potentially unsafe incidents. To be considered timely, reports must be delivered, or postmarked within 10 days of the incident unless that period is extended for good cause. Reports should be submitted on NASA ARC Forms 277B, which are available online at https://asrs.arc.nasa.gov/docs/general.pdf.

Further information is available at https://asrs.arc.nasa.gov/.

Chapter 9 – Airspace Proposals and NEPA

NEPA Background

The National Environmental Policy Act (NEPA) is the nation's charter for the protection of the environment and informed decision-making. It requires all federal agencies to analyze the potential effects of major federal actions significantly affecting the human and natural environments. Public involvement is a key component in the NEPA process and substantive concerns raised by the public must be addressed prior to federal agencies reaching a decision on any proposed action.

Broad guidelines for implementing NEPA have been established by the President's Council on Environmental Quality (CEQ). The DoD, FAA and each land management agency have developed additional detailed internal guidelines and policies for complying with the requirements of NEPA. Agency personnel must refer to these guidelines for further instructions. In addition, the FAA has established processes (aka the FAA Circularization Process) for ensuring that proposals affecting aviation adequately consider all the aeronautical concerns of the users of the nation's airspace.

Airspace Proposals

Airspace-related proposals would be generated by one of two sources. If the proposal originates with one of the military branches, DoD will function as the lead agency and the FAA will act as the cooperating agency in certain cases. (Refer to FAA JO 7400.2K Change 1.) In this role, the FAA will represent the collective interests of the civilian sector, which may include other federal agencies. Should an airspace proposal originate in the civilian sector and potentially impact the military, then the roles are reversed with the FAA serving as lead agency and DoD acting as the cooperating agency. The lead agency is responsible for developing the preliminary airspace proposal and for managing the NEPA compliance process including assuring appropriate notice to the public, user groups, and other agencies. The MILREP located at FAA Service Areas serve as the key facilitators between the military, the FAA, and affected land management agencies.

NEPA Requirements

A proposal for federal action, whether external or internal, triggers NEPA. The level of NEPA required will depend upon the type of action. Through the NEPA process, actions will be assessed by definitive criteria to determine the level of environmental evaluation required to meet the requirements for both the lead and cooperative agencies. Most actions will require compliance with only one level of NEPA analysis. However, if a potentially significant impact is identified during the analysis process a higher level of NEPA assessment may be required.

The following four categories discuss levels of NEPA:

1) Emergency Procedures

   Emergencies requiring immediate response to prevent or reduce the risk to public health or safety, property, or important resources may be managed without initially meeting normal agency NEPA requirements. Agencies are limited to the minimum actions needed to reasonably control the immediate effects of the emergency and once the immediate emergency is controlled, the more detailed assessment requirements of NEPA must be met. Other portions of the action, follow-up actions, or related or connected actions, remain subject to the normal NEPA requirements. With the exception of a TFRs, airspace-related actions would normally not fall within the emergency category. The nature of the emergency and the basis for the decision to

bypass the normal agency NEPA process must be documented in writing and made part of the respective agency files.

The National Environmental Policy Act lays out three broad categories of NEPA impact assessment including categorically excluded actions, actions that require an EA, and actions that require an EIS.

2) Categorical Exclusion (CATEX)

A CATEX are categories of actions that federal agencies have determined to not have significant effect on the quality of the human environment (individually or cumulatively). Each agency has its own list of CATEX, which are not applicable to another agency action. One federal agency's CATEX cannot be used for another agency's action. A CATEX finding must be documented in writing, specifically noting which exclusion has been applied. The CATEX finding must also document that there are no extraordinary circumstances which would require a higher level of NEPA analysis. Airspace management actions proposed by land management agencies generally do not fall within a CATEX. DoD categorical exclusions are somewhat different from those available to the land management agencies and often their airspace proposals are more likely to qualify for a CATEX.

3) Environment Assessment

An EA is prepared for actions which do not qualify for a categorical exclusion or if there are extraordinary circumstances that trigger further environmental study. Additional analysis and public input are needed to know whether the potential for significant impacts exist.

Actions are analyzed in an EA if the actions are not categorically excluded or if there are extraordinary circumstances, not covered in an existing environmental document, and not normally subject to an EIS. The EA is intended to be a concise public document that provides sufficient evidence of an analysis for determining the significance of impacts from a proposed action. The EA describes the agency's purpose and need for action; identifies the relevant issues for analysis; identifies the areas of the environment that are likely to be impacted by the proposed federal action, and describes the possible impacts associated with the potential action; and proposed mitigating actions. Environmental Assessments require review by other agencies if the agency has jurisdiction or special expertise. EAs also require some form of public involvement in the preparation of the EA.

An EA can take several months or even years to prepare. In some cases, NEPA compliance prepared for another action, such as a Final EIS (FEIS) accompanying a resource management plan, may be applicable to a newly proposed action and can be tiered from, incorporated by reference, or adopted to avoid redundancy and unneeded paperwork by utilizing previous environmental analyzes.

Based on the analysis, the document provides a determination as to whether the selected alternative will have significant environmental effects. This determination will yield different results. Thus, every EA leads to a Finding of No Significant Impact (FONSI) or a Finding of No Practical Alternative (FONPA) if wetlands are involved. This may lead to a decision to implement the action as proposed or with some recommended mitigation or Finding of Potentially Significant Impacts, which may lead to a decision to prepare an EIS, or a decision not to move forward on the proposal.

4) Environmental Impact Statement

   The fourth and most detailed level of review is the EIS. This is required for any proposed action whose impacts on the human environment may be significant. An EIS involves detailed assessment of the environmental impacts and extensive public involvement. This is a lengthy and expensive process; agency personnel should seek internal agency guidance before initiating the process. Most proposals to establish a long-term airspace use will require an EIS.

Role of the Land Management Agency

Regardless of whether the proposed action is generated by the military, or on behalf of civilians, agency personnel must become immediately involved. Long before the more formal stages of the NEPA process begins, scoping is initiated by the lead agency in which the proposed action is defined, likely impacts are listed, and potentially affected entities are identified. It is critical that issues affecting land management agencies be identified and discussed at the scoping stage. In some cases, the concerns can be mitigated at this time, or the proposal can be altered to resolve a potential problem. Even if there is no resolution, raising issues at this early stage allows for a more reasoned discussion during the formal process. In order for this involvement to occur agency personnel must be active in local and regional airspace organizations and must have established relations with military and FAA counterparts.

Land management agencies are responsible for providing detailed information as to which resources may be impacted and what the impacts are projected to be. The identified impacts must be supported by established natural or social science information.

Understanding the FAA Circularization Process

The FAA Circularization Process is used by the FAA to specifically identify aviation concerns regarding a proposed action and is sometimes initiated concurrently with the NEPA process. Not all proposals or studies are circulated to the aeronautical community for comment. Guidance for the FAA Circularization Process is provided in FAA Order 7400-2, Procedures for Handling Airspace Matters. Proposals requiring public notice which may or may not include circularization include:

A. Those that would affect an airport (public use),

B. Those requiring a change in aeronautical operations or procedures,

C. When a structure exceeds obstruction standards, or

D. When a structure would have a possible impact on VFR operations.

   (**Note:** the FAA has advised that A and D are not applicable to SUA matters.)

Circular notices provide a detailed description of the proposal including charts that will help interested persons or organizations in preparing comments. The FAA Service Area Airspace Specialist sends out a circularization with a 45 day public comment period to individuals/organizations on its circularization lists which include all known interested persons and groups such as State Aviation agencies, Regional Military Representatives to the FAA (MilReps), national and local offices of aviation organizations, local flight schools, local airport owners, aviation managers, FBOs, local air taxi and charter flight offices, and other government agencies. The FAA Service Area Airspace Specialist reviews and prepares, in consultation with the airspace proponent, responses to the aeronautical comments from the study and circularization process.

This process is designed to deal solely with the aeronautical aspects of the proposed action. Resource related concerns must be addressed in the NEPA process rather than in the circularization process. Comments relating to non-aeronautical issues will not be considered during the FAA Circularization Process.

Responding to an Airspace Proposal or Circularization

There are many factors to consider when dealing with airspace actions or proposals that may impact an agency or its operations.

- SUA proposals
- Air tour proposals
- Environmental proposals
- Reviewing/creating airtanker bases or helibases
- Campground/Wilderness proposals
- Reviewing/creating retardant abort sites

The following factors should be considered when evaluating an airspace proposal, for both long-term and recurring events. The list is not all-inclusive, but can be used as a guide, and will influence who needs to be contacted as well as when and how the contact is to be made.

- Status of airspace (MTR, SUA, etc.)
- The effect the proposal has on other airspace
- Increase or decrease of traffic over the agency's land
- Any hazards present (cables, hazardous materials, etc.)
- Hazards/conflicts to airspace as a result of this proposal
- Presence of helibases, helispots, airstrips, or other aviation facilities
- Agency Aircraft operations in the area
- Change in the type or mixture of aircraft presently operating in the airspace
- Impact on communication systems
- Impact on agency law enforcement, wildfire, search and rescue, reconnaissance, detection, or wildlife management flights
- Airports and their limitations
- Ground facilities involvement
- Weather considerations
- Type and number of aircraft involved; speed and altitude of operation
- Type of load (internal or external)
- Location and geographic boundaries of the project
- Timeframes associated with the project
- NEPA considerations

- Noise and visual impacts
- Is the proposal diurnal or seasonal in nature
- Land ownership of the land the project will be associated with, adjacent ownerships
- Land-use allocations and zoning categories
- Proposed or designated Wildernesses
- Impact on existing agreements or the need for additional agreements
- Impact on natural or cultural resources
- Impact on recreational activities
- Level of public participation anticipated summary of public input
- FAA Circularization Process
- Approval authorities, including state agencies
- Communications and Coordination Plan (internal and external)
- Agency processes and requirements
- Mitigation measures needed or in place

Agency Involvement

Agency personnel are encouraged to establish working relations with their counterparts in other civilian and military agencies. Open lines of communication will assure timely notification of proposals and assure appropriate agencies are involved. The FAA maintains a mailing list for sending written notice of airspace proposals. The military and other civilian organizations maintain similar mailing lists.

Agency personnel should also participate in the U.S. Air Force/ANG Regional ARC meetings (see Chapter 2). Other sources of information on proposals include legal notices in area newspapers, newsletters from aviation organizations such as the AOPA, (www.aopa.org/) or land management support organizations such as the National Parks and Conservation Association (NPCA).

Additional References Available

- CEQ Regulations for Implementing the NEPA, 40 CFR Parts 1500-1508
- FAA Order 1050.1F, "Environmental Impacts: Policies and Procedures"
- FAA Order 7400.2K, "Procedures for Handling Airspace Matters," Section 5 “Processing Non-Rulemaking Actions.” This includes Circularization documentation
- FAA Order 7400.2K, "Environmental Matters" and the associated appendixes (for specific SUA environmental direction) https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/1031010

Chapter 10 – Developing a Local Airspace Coordination Program

Introduction

The myriad of airspace and local interagency relationships across the nation pose unique coordination challenges; no one method or timeline fits all situations. While selected airspace or flight operations may be conducive to coordination through a committee process, others may be more appropriately handled with local one-on-one coordination.

Effective interagency coordination at the local level focuses on the cooperative resolution of aviation and environmental issues. Regardless of the level of formality established to achieve interagency coordination, an organized approach creates the greatest potential for all parties to develop mutual respect and understanding of agency mandates, which fosters team building and balanced resolution of issues.

Aviation and airspace managers are the key communicators between airspace users and agency managers facilitating interagency communication so all parties involved may better understand and cooperatively resolve issues of mutual concern. Effective interagency coordination starts with thorough and timely internal dialogue between airspace users and managers. With user priorities clearly understood by aviation and airspace managers, interagency coordination processes can be initiated. Regional Military Representatives to the FAA (MilReps), local military airspace managers, resource agency aviation managers, and unit aviation managers are typically involved. A wide variety of tools are available to facilitate dialogue and issue resolution, such as:

- Informal agreements
- Videos/publications
- Airspace agreements
- Checklists
- TFRs
- Crash/Search Rescue Guide
- Advisory NOTAMS
- Critical airspace contacts phone list
- Temporary towers
- Standardized/customized forms
- Educational tools
- Training, exercises, classes
- Site visits
- Brochures

Airspace Analysis

There are several methods that can be used to analyze airspace use and identify potential future conflicts, and/or determine coordination efforts for conflict resolution.

1) Land Ownership/Use Patterns

   Land ownership provides an indication of the number of potential partners who may be involved in the development of airspace agreements that could alleviate potential airspace conflicts. Activities associated with specific resources should be coordinated with resource specialists as well as administrative contracting (e.g., service or job contracts).

   An example of this evaluation process would be a review of a land ownership map to determine agency ownership and significant uses such as seismic exploration, wild horse collection, or aerial seeding. Airspace "ownership" and users could then be overlaid (e.g., using GIS systems) to determine impacts and potential conflicts with military units. Additional aviation information could then be determined to present a fairly complete picture of a geographic area in which airspace conflicts might occur.

2) Trend Analysis

   Unit aviation managers, in concert with their respective aviation safety officer, should review historical aviation uses. This evaluation will identify conflict areas that may exist between land management needs and current airspace parameters.

   Sources for this analysis may include historical files of flight scheduling forms and project air safety plans, contract files, resource survey project files, and SAFECOMs. This analysis should include military as well as civilian sources.

   Agencies with contiguous borders should coordinate with each other. The intent is to capture a complete historical overlay of aviation use. This information, coupled with mapping information, will provide a base for primary determinations of airspace conflict.

3) Risk Management

   Historical review of aviation complications (incident/hazard and accident reports) provides a trend analysis of patterns that may be contributing to operational problems. Trends identified through SAFECOM reporting systems provide the basis for risk management decisions concerning specific and long-term agency aviation projects. Risk reduction, which may involve implementation of airspace agreements, can be accomplished by following the processes and procedures contained in this publication and by coordinating training programs, etc.

Natural and Cultural Resource Issues

Within agency programs, there may be possible impacts to natural or cultural resources. Agency representatives involved in airspace coordination should be aware of potential noise and vibration induced impacts associated with over flights of these resources. Follow agency guidelines as appropriate. These situations may include:

- Migratory bird routes
    - Historical artifacts
    - Tribal ceremonies (e.g., vision quests)
    - Wildlife breeding, resting/wintering areas
    - Recreational (e.g., Wilderness)
    - Natural quiet

Airspace Activities

There are many recurring or non-disaster operations that can and will affect the airspace, but do not need a TFR nor meet the criteria for a TFR. Not all of these operations will use aircraft, but their operations could have an impact. The project location, duration, timing, size, or area, altitudes, hazards, and many other factors must be considered. These factors will influence who needs to be contacted, when to make contacts, and how to contact the required entities.

Select ground operations also affect airspace. Logging operations that use the high lead method could place cables in a location that could be within an MTR or other area that has or may have aerial use, such as hang gliders, sailplanes, a student practice area, or approach, and departure paths to an airport.

Another example of a ground activity affecting aerial activity is blasting. Further information regarding blasting activity is in Chapter 4, Airspace Hazards. Advance notice of at least 24 hours prior to a planned blasting activity should be forwarded to the appropriate MTR, or SUA scheduling authority by the blasting contractor. A notification may be made by the agency dispatcher as a courtesy notification to the Military Scheduling Unit of the airspace involved.

Aerial activities such as a large spray project, aerial seeding, photography, monitoring resources, prescribed fire, VIP flights, research flights, wildlife, and horse/burro flights, require thorough and timely coordination with affected agencies. Early coordination minimizes conflicts with military activities which may be scheduled months in advance.

There are three kinds of airspace activities:

1. Scheduled airspace activity – an airspace activity that is being planned for a specific time and date(s).
2. Recurring airspace activity – a day-to-day, ongoing activity.
3. Time-critical airspace activity – an emergency event such as wildland fire, Search and Rescue (SAR), etc.

1) Scheduled Airspace Activities

Scheduled airspace activities are planned in advance. Contact should be made with the appropriate military airspace managers and units, or the FAA to initiate coordination. If conditions warrant, an airspace agreement would facilitate cooperation and coordination between the agency and military unit. Examples of events that may require preplanned airspace coordination are as follows:

- Aerial spray projects
- Aerial seeding
- Aerial photo projects
- Hang gliding competitions
- Movie flights
- Research flights
- Balloon gatherings
- Wildlife flights
- Recon flights
- Telemetry flights
- Prescribed fire flights
- Mitigation monitoring flights
- Dignitary/VIP flights
- Blasting
- Helicopter logging
- Horse and burro management flights
- Military exercises

2) Recurring Airspace Activities

These are events that are ongoing, day-to-day activities. Risk mitigation factors could include sharing maps of planned flights with DoD Scheduling Activities or Scheduling Agencies. Many agency events are recurring, such as a time limited project (e.g., 14 flights in the same area in a two-week period), or a planned daily event such as aerial detection. The benefit of coordination is that the FAA and DoD reports have stated that if two aircraft are aware of each other's presence, the risk of a mid-air collision can be reduced. In many cases, DoD will voluntarily deconflict the involved airspace (e.g., via scheduling changes), but are not required to do so unless there is a TFR established. The following are examples of recurring events:

- Detection flights
- High lead cable/tower logging
- Hang gliding
- Air tour operations
- Migratory bird routes

3) Time-Critical (Emergency) Airspace Activities

These are events that require immediate response and coordination. In these situations, prioritization and timing are essential. A proven tactic to facilitate emergency response is pre-planning; it ensures that a unit or individual is prepared to deal with the given situation such as a preplanned military exercise. An unscheduled event requires a different approach. Preparedness for events such as Temporary Flight Restrictions, Temporary Towers, NMACs, and intrusions enable units to respond in a standardized, coordinated way that is designed to ensure success. Units are encouraged to periodically test their emergency responses to confirm that they know "who to call" and "when to call" when reacting to time-critical situations. The following are examples of time-critical events:

- NOTAM TFR coordination
- Law enforcement activities
- Wildfire aviation activities
- Unsafe aircraft activities
- Search and rescue (SAR)
- Intrusions
- Near mid-air collisions
- Border incursion

The following are some factors that should be considered when coordinating an airspace activity or event requiring a time-critical response. The list is not all-inclusive but can be used as a guide. It will aid in determining who needs to be contacted, as well as when, and how the contact is to be made.

- Location and geographic boundaries of the project.
- Projected time frame, or when did event happen?
- Project complexities.
- Is media interest expected?
- What are the notification procedures? Chain of command?
- Are processes and/or mitigation measures already in place?
- Is a Temporary Tower, TFR, and/or Advisory NOTAM needed?
- Was there an intrusion? (Reference Chapter 8).
- Are airports, SUAs, or MTRs affected?
- What are the known airspace hazards?
- Are communications and frequency plans in place?
- What other aircraft have been dispatched and are en route?

When an unplanned event occurs, the appropriate response may be time-critical. In some cases, it will trigger the initiation of a prearranged operation procedure that applies to that event (e.g., wildfires, SAR, some law enforcement, and media activities). Checklists, written plans, and guides are developed and used to determine appropriate responses and are customized to local units as needed.

Local coordination agreements with military units may provide an informal process for reporting and investigating incidents involving military aircraft. These procedures may be used to supplement a formal FAA reporting process. However, it is the agency's responsibility to determine what level of report is appropriate, and to forward this information in a timely manner.

Chapter 11 – Temporary Towers

Introduction

Temporary Towers should be activated when conditions of visibility, or level of activity at an uncontrolled airport or helibase are such that a tower will enhance safety. Airspace coordination with other users of the NAS is essential. Sometimes there may be a need within an incident operation (either at uncontrolled airports or helibases) to obtain professional ATC services by ordering a Temporary Tower.

Note: Temporary Towers are only for ingress and egress to and from an airport or helibase. The air traffic controllers give advisories and do NOT manage any airspace, including the airspace within a TFRs.

Current agreements with the FAA provide for qualified air traffic controllers as requested for emergencies. No provisions have been implemented between the FAA and the DoD for agencies to utilize DoD air traffic controllers or Towers. The FAA remains the nation's airspace manager and has agreed to provide Temporary Tower services on an as needed basis; but they also use contract controllers when it is feasible. Requests from the FAA may be forwarded to the FAA's Regional Operations Centers (ROC) with a request to speak to the Temporary Tower Duty Officer. Be prepared to email the duty officer the Resource Order and the Temporary Tower Request Form.

Privately based vendors with proposals to provide air traffic services are encouraged to contact the FAA. There are some vendors who have local agreements and are ordered as a closest resource when it is cost feasible, or the FAA is not available. Consult your GACC for a regional list of vendors with an Emergency Equipment Rental Agreement (EERA) or Virtual Incident Procurement (VIPR) agreement.

When appropriate, the Mobile ATC Tower will comply with the criteria established in FAA Joint Orders 7110.315: Non-federal personnel supporting air traffic operations involving civic events must be properly certified and rated in accordance with the 4 CFR Part 65, Subpart B. Non-federal personnel air traffic controllers must be properly certificated and rated in accordance with 14 CFR Part 65 for the airport. The vendor is responsible for its employees meeting FAA requirements. Vendors will coordinate with the FAA who will provide Air Traffic Control Specialist (ATCS) Certifiers that will travel to the vendor's location for certification of the unit prior to it being operational, and at no cost to the incident.

Determination of Need for Temporary Towers

Prior to ordering a Temporary Tower, agency aviation management should validate the need. This should be a joint decision between the Incident Management Team, FAA, and local Unit Aviation Officer. Airport managers, pilots, and aircraft managers should also be consulted. A risk assessment should be completed to analyze the necessity of ordering a Temporary Tower.

Temporary Towers should be activated if doing so will enhance aviation safety. Situations that increase the hazards to both participating and nonparticipating aircraft may include:

- Incident Operations being conducted from, or in proximity to, an uncontrolled airport; or,
- A high volume of aircraft traffic anticipated in close proximity to each other; or,
- A high frequency of non-incident aircraft using common airspace; or,

- Special events being conducted adjacent to the incident or at the airport where incident aircraft are operating; or,
- Weather (primarily visibility) conditions such that flight operations would be enhanced through use of certified controllers; or,
- Risk assessment of involved airspace indicates the need for ATC.

Ordering a Temporary Tower

The ordering process may be comprised of two parts (personnel and equipment):

1) Controllers and Supervisor: The FAA or vendor will determine the staffing and the rotation schedule of all involved based on the request identified in the resource order and the Temporary Tower Request Form.
2) The tower could be one of the following:
   a. An existing facility at the location (perhaps a closed tower), or something that offers a 360-degree view.
   b. An FAA Certified Trailer (provided by the FAA).
   c. An FAA tower in a box, or suitcase tower provided by the FAA, shipped to the location.
   d. Rental of a vendor trailer that is FAA Certified for Tower Operations.
3) Frequencies will be provided by the FAA when they receive the request for a Temporary Tower. The FAA makes a determination of need during the preliminary discussion of the resource order and the Temporary Tower Request Form. The vendor will coordinate their frequency request with the FAA.

Tower Ordering/Set-Up Process

A Temporary Tower is not by definition a structure when ordered on a Resource Order. It is usually two air traffic controllers and a supervisor, who may or may not arrive with the equipment (including radios) they need to operate. The incident should plan to order support equipment through established ordering channels. Shelter from the elements should be provided for tower personnel to reduce fatigue and improve safety conditions while they are working.

1) Dispatch submits a resource order through their appropriate channels for a tower as an A (Aircraft) request, identifying date, time, location, and projected operational periods (e.g., sunrise to sunset). Consult the Temporary Tower Request Form, https://www.nwcg.gov/tags/iasc, for further information.
2) The tower will be staffed appropriately to meet projected traffic requirements in the area and handle any internal requirements. ATC personnel will be rotated in accordance with operational requirements. FAA personnel are not committed to 14-day assignments. The FAA will handle the personnel switch-outs as needed and may request assistance with travel arrangements.
3) The local Unit Aviation Officer or AOBD is responsible for providing a thorough briefing to the controllers. The controllers should participate in the daily briefings with pilots and other aviation personnel. Refer to Chapter 7.

4) If an IMT is in place, the incident AOBD or designee shall ensure a briefing on the tower facility and include details in the Air Operations Summary (ICS 220).
5) Ensure adequate FAA certified radios are available for use. The 720-channel VHF-AM radio is required, and a VHF-FM radio is occasionally needed. Coordinate to ensure that all radios are FAA certified for use.
6) Request that the airport manager/FAA/vendor requests a NOTAM that informs the public a Temporary Tower has been established; and include its operating hours and the radio frequency for contact with the tower. Once the frequencies and hours of operation of the Temporary Tower are established, this information needs to be disseminated to appropriate dispatch and aviation personnel including airtanker and helibases.
7) Table 11-1 is a Temporary Tower Checklist that may be used as a guideline for start-up procedures.
8) There may be a need for additional supplies to support the Temporary Tower which are identified in Figure 11-2.

Federal Wildland Fire Temporary Tower Request Form

Note: this form should be used in conjunction with the checklists located in Chapter 11 of the Interagency Airspace Coordination Guide [www.fs.fed.us/r6/fire/aviation/airspace]. Please forward this form with the Resource Order Form to the appropriate FAA Point of Contact (POC).

1. General Information:

Incident Name *(**Expect up to 72 hours for delivery and/or setup**)*

Delivery Location

Requested Operational Hours

Duration of Assignment

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2. Financial Information:

Resource Order Number
(Incident Project Number)

Request Number

Financial Code

Jurisdictional (Paying) Agency

POC Name

Phone

POC E-mail

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3. Justification:

Number of Fire Aircraft currently working at the Airport/Helibase

Daily Operations

[Fire Aircraft] Hourly Operations
(Number of Landings/Take-Offs)

Statement of Justification

Example: *Three large fixed-wing airtankers in addition to normal traffic flows for more than two days may trigger an order for a portable FAA tower and controllers.*

4. Points of Contact:

Airport Owner/Operator Name ☐ Contacted? ☐

Tower Coordinator Name ☐ Phone ☐

POC On Site Name ☐ Phone ☐

5. Support Information: *(Where is the proposed location of the temporary tower?)*

Closest City or Town ☐ State ☐

Airport Name and FAA Identifier ☐ Helibase ☐

Incident Command Post ☐ Other ☐

Are you requesting an FAA Mobile Control Tower Facility? ☐

POC On Site for Tower delivery ☐ Phone ☐

Explain the Controllers Operating Area: (Contractor) Rental Trailer (aka Comm Trailer), Existing Facility (e.g., FBO Site, Room Rental, or Existing Tower) ☐

Name of Hotel for Controllers ☐ Phone ☐

Meals provided for Controllers? ☐ Yes ☐ No

Transportation for Controllers? ☐ Yes ☐ No

Will Controllers stay at ICP? ☐ Yes ☐ No

Detailed Driving Directions to the Reporting Site: *(Please note road closures, Hazardous conditions, easiest route of travel, etc.)* ☐

6. Equipment Information:

(refer to Chapter 11 Checklists that begin on Page 11)-

Complete Equipment Inventory? ☐ Yes ☐ No Available Equipment List:

Equipment Already on Order: ☐

Table 11-1 Temporary Tower Start-Up and Emergency Checklist

Temporary Tower Checklist Guidelines – Start-Up Procedures	Page 1 of 2
Location: _____ By: _____ Date: ____/____/____	
The following should be provided to personnel before travel to their assignment: ❑ Travel directions. Give specific location or address of expanded dispatch for resource order check in if appropriate. ❑ Specific Location of Incident Command Post and airbase (fixed- and rotary-wing). ❑ Expanded Dispatch/Initial Attack Dispatch points of contact and phone numbers. ❑ Points of Contact as appropriate: Local Unit Aviation Officer, AOBD and/or ASGS, Helibase Manager. ❑ Conditions to expect: Camp or hotel quarters, weather conditions, roads, helibase or airbase operations and meals.	
Upon arrival, provide the following general knowledge for assignment: ❑ Check in protocol – Reference information is recommended as tower personnel often have no prior ICS experience. ❑ Lodging arrangements (how to get a hotel room), or how to obtain a sleeping bag, tent, etc. Minimize primitive conditions to mitigate fatigue for controllers. This is a safety and controller union issue. ❑ How the controllers are to order supplies for the tower, eating arrangements, etc. (e.g., through ASGS). ❑ Introduction to basic ICS, chain of command and flow structure: expanded dispatch and initial attack dispatch, Unit Aviation Officer, Air Operations Branch Director (AOBD), Air Tactical Group Supervisor (ATGS), helibase manager, and airtanker base manager. ❑ Unit and incident(s) communications plans, shift plans. ❑ Demobilization or rotation protocol (If FAA: home unit and union rules will determine FAA personnel rotation). ❑ Transportation upon arrival, during assignment, rotation out, and demobilization. ❑ Terminology (e.g., “What is a ping pong ball machine?” “What is a fire shelter?”)	
Before tower is operational, air operations should provide (if feasible): ❑ Providing controller personnel with a familiarization flight of the local area might help them understand the local area as pilots see it. Scope of this flight will vary depending upon whether controllers are being used as tower control, or area-wide flight following, and agency requirements. Visit all aircraft operating facilities (helibase and fixed-wing bases) if possible. It is very advantageous to have the ATGS conduct the familiarization trips.	

Table 11-1: Temporary Tower Start-Up and Emergency Checklist (continued)

Temporary Tower Checklist Guidelines – Start-Up Procedures	Page 2 of 2

Location: _____ By: _____ Date: ____/____/____

A briefing should be held between the tower operators, the AOBD, the ATGS, the ASGS, the helibase manager and/or airtanker base manager, the fixed base operator, incident pilots, and any local pilots continuing to operate from the airport or helibase. Discussion could involve the following:

- ❑ Site selection for towers.
  - Does a facility exist (deactivated tower, building, etc.)?
  - Could you use a rental trailer?
  - Does the facility have an FAA approved view for taxi, takeoff, and approach?
- ❑ Examine existing helibase/airport procedures. If necessary, amend procedures temporarily to meet objectives. Consider:
  - Inbound/outbound flight paths, altitudes, and reporting points.
  - Air traffic patterns to, from, and around the incident.
  - Ground taxi patterns and departure sequence for helicopters and airplanes.
  - Communication procedures.
  - Procedure for obtaining frequency assignments (FAA and/or ATGS).
- ❑ Establish tower hours (Coordinate with supervisor or controller in charge).
- ❑ Rotation and duty day limitations.
- ❑ Ensure the following:
  - Issue NOTAM that tower is operational.
  - Notify agencies that tower is operational.
- ❑ Discuss fire survival (e.g., fire shelters, overrun of base or camp, etc.).
- ❑ Identify distractions and eliminate noise and heat.
- ❑ Discuss if pertinent:
  - Empty weight and loaded weight for runways.
  - Airtanker needs.
  - Restrictions on runways.
  - Local Airport Contacts.
  - Aircraft performance and characteristics–weight.
  - Noise abatement procedures.
  - Procedures if there is a TFR over the airport or helibase.
  - Other TFRs in the area.
  - Their role if there is a TFR intruder.

- ❑ Upon shutdown, be sure to:
  - Plan close to tower in advance.
  - **Note**: The FAA requires lead time in advance for tower closure procedures to be put in effect.
  - Closeout NOTAM.
  - Notify Units throughout agencies of tower closure.
  - Closeout aircraft resource order for Temporary Tower.

The following list of items may be of value for tower operations. The number, size, type, and maintenance supplies (e.g., batteries) needed should also be determined. Check with the AOBD and the controllers before ordering. Some items may not be necessary.

TEMPORARY TOWER SUPPLIES CHECKLIST PAGE 1 OF 1

Location: _____ By: _____ Date: ____/____/____

- ❑ Binoculars
- ❑ Traffic Counter
- ❑ Wind and Altimeter Instruments
- ❑ Temperature Instrument
- ❑ Light Gun – battery powered
- ❑ Wind Sock
- ❑ Clocks 24 hour – 1 for local, 1 for (UTC) Zulu
- ❑ Goggles (if needed)
- ❑ Writing Table
- ❑ Roof/Sun Cover
- ❑ Chairs
- ❑ Basic Office Supplies (pads, pens, pencils, tape, stamper, scissors, etc.)
- ❑ Generator (if needed)
- ❑ Extension Cord (if needed)

- ❑ FAA 7230-10 Position Log
- ❑ FAA 7230-4 Daily Log
- ❑ ICS Unit Logs

- ❑ Radios – main and battery back-up (edo-air)
- ❑ VHF radios (Three – One local, One ground if necessary, and 1 Tunable to local Unicom if at an airport)
- ❑ Telephones (cellular or regular)
- ❑ UHF radios

- ❑ Bottled water/Water cooler
- ❑ Lights/Lamps
- ❑ Fans
- ❑ Flashlights
- ❑ Fire extinguisher

- ❑ Plotters
- ❑ Navigational Charts & Sectionals
- ❑ Forest maps
- ❑ State aeronautical chart
- ❑ Fire maps
- ❑ Airport diagram
- ❑ Chart Supplements Airport Facility Directory
- ❑ US Terminal Procedures (for approach plates)

NOTE: Consider ordering NFES 4300 which has SOME material that could be used as an FAA portable control tower. This kit is a portable battery operated VHF-AM aircraft base station consisting of a 760 Channel AM radio. If this kit is to be used as an FAA Temporary Tower, the resource order MUST be placed by the incident COML.

Figure 11-1: Temporary Tower Supplies Checklist

Chapter 12 – Airspace Agreements

Introduction

When SUA, MTR, SR, and/or LATN areas are located in the airspace above an agency's land jurisdiction (or within their area of normal flight operations–fire or non-fire), the agency should consider instituting an agreement with the appropriate DoD entity.

An airspace agreement will have a name depending on its purpose. The FAA and DoD frequently enter LOAs which specify airspace responsibilities. Other agencies utilize MOUs and Interagency Agreements (IAs) to facilitate cooperation between agencies. Agency aviation managers should work closely with their Agency Agreement Specialists to ascertain they are following specific agency protocol for agreements and utilizing the proper instrument for the purpose.

Airspace agreements are usually nonmonetary; establish protocol for deconfliction procedures during emergency and non-emergency situations; and establish points of contact.

It is prudent that all agencies be a party to a common airspace agreement with the DoD when land management or wildland firefighting agencies share or overlap boundaries within jurisdictions that underlie DoD managed or assigned airspace. Coordination with the unit Airspace Manager, DoD Military Representatives (MilReps), as well as the appropriate agency aviation managers, dispatchers, coordinators, and agreement specialists is highly recommended.

The agreement should be signed by the appropriate level of authority within the land management agency (consult with agency procurement office and/or agreement specialist). The commander of a military unit is usually the responsible agent or signatory in these documents even though others within the unit may be identified for particular tasks.

Airspace agreements provide local level leadership a tool within the interagency cooperative process to define procedures that consistently address recurring activities, coordination of time-critical responses, and resolving unforeseen issues of mutual concern.

In addition to establishing procedures for deconflicting airspace or coordinating TFRs, the airspace agreement identifies each agency's specific responsibility. This is particularly important in providing continuity, when either local level resource management agency or DoD leadership changes.

There are a wide array of cooperative methods and processes for local leadership to tailor agreements in order to meet their specific area's interagency challenges. Airspace agreements should sufficiently define responsibilities, methods, procedures, and local POCs.

Specific protocols contained in the agreements could affect tactical air crews (i.e., airtankers, lead planes, Aerial Supervisors, SEATs, and or helicopter crews). Local aviation managers should ensure that agency airtanker bases where these resources are likely to operate from are aware and briefed of the procedures outlined in the agreement.

In order to assist with deconfliction, some consideration should be given to including graphics of the dispatch office/district geographical mapping, with any associated military airspace overlaid through the use of GIS techniques. This may be provided by the military Airspace Manager, or through the agency with the land-use jurisdiction. Any inclusion of this kind of detail should be reviewed annually for applicability by all parties to the agreement and updated accordingly.

Agency Personnel should be aware that several agencies specify mandatory clauses when drafting airspace agreements commonly known as “boiler plate clauses.” Agreement specialists should ensure that these required clauses are integrated into the agreement. If they are agency specific, they could be incorporated on the signature page for the specific agency.

One way to distribute the agreement is the joint development of local coordination guides (in flip-book format) to distill the action items of the agreement into quick referral checklists which would facilitate the execution of time-critical actions by dispatchers and military airspace scheduling offices.

A generic format for developing interagency airspace coordination agreements is provided in this chapter. To supplement the agreement, a local coordination guide could segregate specific DoD/land management airspace scenarios with specific operational directives contained within the body of the agreement.

Categories may include:

1) Dispatch Operational Procedures
    - Non-Fire Scheduled Missions
    - Fire Reconnaissance (No TFR in place)
    - Fire Operations (No TFR in place)
    - Fire Operations (TFR in place)
    - Deconfliction of Airspace
    - Implementation of TFRs
2) Operational Procedures (Fire or Non-Fire) for Pilot and Flight Crews
3) DoD Operational Procedures
    - Non-Fire Planned Missions
    - Non-Fire Priority Missions
    - Fire Reconnaissance (No TFR in place)
    - Fire Operations (TFR in place)

Template for Airspace Cooperative Agreements

The following sample will provide you with the types of information you will need to provide to your agency procurement office/agreement specialist.

Sample LOA/MOU Format

SUBJECT: Interagency Airspace Coordination

I. Participating Agencies and Units

Provide list of involved agencies and units for this agreement.

II. Purpose—Introduction or Background

Provide an introduction and background of agreement.

III. Objective

Specify goals you wish to achieve by this agreement.

IV. Cancellation

List any prior agreements that are cancelled, superseded, or modified by the new agreement. List protocols for modification or cancellation of this agreement.

V. Scope

List the specific agency and DoD organizations/offices, airspace units and resource management areas subject to the agreement. Include a description of airspace.

VI. Authority List

List laws and regulations that authorize or permit organizations to enter into IAs.

VII. Responsibilities

A. Management Authority and Responsibility

1) Land Management Agency (or Agencies).
    a. Designate the agency offices to coordinate procedures and airspace scheduling through military airspace scheduling office.
    b. Designate the agency focal point for recommending amendments to the agreement.
    c. Designate the POC for the military to coordinate amendments to the agreement.
    d. Coordinator with military on all airspace conflicts, incident conclusions, or findings regarding airspace conflicts.
2) Military Airspace Manager.
    a. Designate the focal point for military on airspace matters and the agreement. Designate as POC for resource agencies on matters pertaining to the agreement.

B. Provide Details of Responsibilities:

1) Name of Agency (complete the following for each agency).
   a. POCs and their roles (**Note**: POCs could be an appendix to the agreement).
   b. Air Traffic Control and coordination requirements.
      ii. FAA coordination concerning issuance of TFRs.
      iii. Transponder codes/squawks.
   c. Coordination with military airspace scheduling offices.
      i. Long-term, planned flight operations.
      ii. Rapid Response flight operations.
   d. Reporting incidents/accidents.
   e. Method to ensure all personnel involved are briefed on the purpose and procedures of the agreement.
2. Involved DoD organizations (complete the following for each unit, department, etc.).
   a. ATC, advisory, and/or monitoring services for airspace users (if applicable).
   b, TFR NOTAM information dissemination to military units.
   c. Administrative (preplanned) and real-time (emergency) scheduling of agency's air operations activities within agreement airspace.
   d. Ensure all personnel involved are briefed on the purpose and procedures of the agreement.

VIII. Coordination Procedures (Non-Fire or Fire Recon—Without a TFR)

A. Land Management Agency Responsibilities

1. Between dispatchers or aviation managers and military airspace scheduling office.
   a. Scheduling timeline protocols.
   b. Forwarding of flight planning and area of operations information.
2. Coordination and communications with military ATC facilities.
   a. ATC transponder code protocols.
   b. Radio communications requirements.
      i. Prior to entering agreement airspace.
      ii. While within airspace.
      iii. Exiting airspace.
3. Coordination with Range Operations Centers (as applicable).

B. Military Airspace Scheduling Office Responsibilities

1. Advise land management agency dispatchers or aviation managers of projected or known military flight activities within the times and areas they have identified.
2. Coordinate resource agency flight activities with all DoD units scheduled to operate in.

3. Protocols to handle airspace scheduling conflicts.
    a. Within RAs
    b. Within MOAs
    c. Within MTRs

C. Military ATC Responsibilities (If Available)

1. Transponder code assignment protocols.
    a. Assignment to aircraft.
    b. Relay to Range Control.
2. Local altimeter setting.
3. VFR flight advisory or flight following services.
    a. Level of service appropriate for radar equipment certification.
    b. Services provided time permitting.
    c. Coordination of level of service provided to resource agency aircraft.

D. Range Operations Center Responsibilities (If Available)

1. Protocols for resource agency aircraft within MOAs.
    a. Communications
    b. Coordination
2. Protocols for resource agency aircraft within RAs.
    a. Communications
    b. Coordination
3. Coordination with military ATC (if available).
    a. Resource agency aircraft routing within ranges and MOAs.

IX. Coordination Procedures (Fire Response—With A TFR)

A. Land Management Agency Responsibilities

1. Immediately advise the military ATC facility (if applicable), Range Operations Center (if applicable), and Range Control of the reported fire, requested TFR and/or reconnaissance route. Include latitude and longitude information when available.
2. Request a TFR with the appropriate ARTCC.
3. Notify the identified military units/Scheduling Activity/Range Operations Center/Range Control (when applicable) that there is a TFR requested from the FAA.
4. If necessary, notify the appropriate military command and control agencies of ingress/egress routes and services required to facilitate emergency response activity. Advise as to type of aircraft and proposed route to area of operations.
5. Advise appropriate military command and control agencies of any modifications to and/or cancellations of TFRs.

6. Ensure that resource agency aircraft contact the appropriate military command and control agencies prior to entering airspace.
7. Ensure all resource agency aircraft obtain permission to operate within RAs.
    a. Scheduling timeline protocols.
    b. Forwarding of flight planning and area of operations information.

B. Military ATC Responsibilities (If Available)

1. Notify Range Operations Center (if available), Range Control, Base Operations and Supervisors of Flying (SOF) of any TFRs that may affect operation to, from, or within SUA.
2. Issue applicable TFR restrictions to aircraft flying in vicinity of a TFR area and facilitate communication between Range Operations Center and/or Range Control and the resource agencies regarding deconfliction/advisory information.
3. Notify Base Operations and SOFs upon receipt of information indicating impending restrictions or closure of MTR(s) and SRs due to TFR. Repeat notification upon receipt of NOTAMs associated with MTR(s) and/or SRs.
4. Provide awareness to flight crews of ingress/egress routes of tactical firefighting aircraft.
5. Facilitate the approving authority for resource agency aircraft requesting ingress/egress of RAs.
6. When appropriate, assign transponder codes/altimeter settings to resource agency aircraft and advise them of MOA/Range status.

C. Range Operations Center Responsibilities (If Available):

1. Comply with TFRs as issued by the FAA and relay TFR establishment, changes, and cancellation to all aircraft.
2. Relay TFR restrictions to all military ATC facilities (if available), and air crew (whether airborne or scheduled).
3. Coordinate with MTR schedulers to restrict or close SUA, MTRs, and SRs affected by TFR.

X. Cancellation of TFR

Outline protocols as applicable for FAA ARTCC, military ATC facility (if available), Range Operations Center (if available), and/or Range Control.

XI. Incident/Accident

If this is not defined within other established procedures, outline protocols for incident and/or accident situations.

XII. Education and Awareness

Outline procedures to enhance education and awareness such as site visits, preseason meetings, year-end meetings, training opportunities, etc.

XII. Termination or Renewal of Agreement

Outline protocols for termination or renewal of agreement. Provide for yearly reviews.

The *NWCG Standards for Airspace Coordination* is developed and maintained by the Interagency Airspace Subcommittee (IASC), under the direction of the National Interagency Aviation Committee (NIAC), an entity of the National Wildfire Coordinating Group (NWCG).

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While they may still contain current or useful information, previous editions are obsolete. The user of this information is responsible for confirming that they have the most up-to-date version. NWCG is the sole source for the publication.

This publication is available electronically at https://www.nwcg.gov/publications/520.

Comments, questions, and recommendations shall be submitted to the appropriate agency program manager assigned to the IASC. View the complete roster at https://www.nwcg.gov/committees/interagency-airspace-subcommittee.