

# *Chapter 7*

## *Midair Collision Avoidance Program (MACA)*

### **I. Introduction**

Studies of the midair collision problem have revealed some interesting and surprising information. According to AOPA Air Safety Foundation and the NTSB (National Transportation Safety Board) nearly all midair collisions occur during daylight hours, in VFR conditions (with visibility of at least three miles) and involve aircraft flying in areas of high traffic congestion which could be around airports or emergency operations where a concentrated number of aircraft are operating. In the end it comes down to a failure of the see and avoid system but there usually are a number of factors leading up and contributing to this failure. As agency personnel there are a number of steps that can be taken to reduce the risk of a midair collision.

The objective of a MACA program is to prevent airspace conflicts through improvement of airspace coordination procedures. This should enhance communications, quality of information, and situational awareness among dispatchers, coordination centers, pilots, air crews, aerial supervisors, air tanker base and air attack base managers, and ground incident personnel.

This chapter addresses airspace coordination for dispatch and aerial firefighting during initial attack, extended attack, and large fire, as well as the dispatch and coordination of resources to all-risk incidents.

Several guides identify airspace procedures which are policy for federal firefighting agencies, but have not been adopted by state or local agencies (e.g. Air Tactical Group Supervisor, and Lead Plane Operations Guides). Nonetheless, the procedural information in these Guides is pertinent to all the issues regarding airspace coordination. These documents will be referenced where appropriate.

The following areas are of particular concern for reducing our risk of a mid air collision:

**A. Briefings**

Comprehensive, accurate information should be furnished, including general incident status, frequency lists, maps, flight restrictions, etc

**B. Debriefings**

Feedback on day's operations should be obtained from aerial firefighters, pilots, and dispatchers. Corrective action necessary should taken prior to the next operational period.

**C. Initial Attack**

Initial attack in proximity to or in conjunction with large incidents. Coordination by local unit dispatch and local resources with team air operations should be performed.

**D. Visibility**

When flights are being conducted within legal VFR but in conditions of decreased visibility, special procedures should be implemented when necessary and communicated to all levels of the dispatch and aviation communities.

**E. Dispatch of Resources On Initial Attack**

When resources are being dispatched by more than one unit or by more than one agency to boundary incidents, special care should be taken to ensure safe separation and communication among aircraft. This issue may involve co-located or physically separate dispatch units.

**F. Dispatch Information**

When resources are being dispatched to reported incidents where location is uncertain, special attention should be given to quality of information. Pilots and air crews are responsible for immediately relaying corrected locations, changed frequencies, need for a TFR, etc. Unit dispatchers and/or GACCs are responsible for relaying corrected information through the system in a timely manner.

**G. TFRs and Airspace Coordination - Awareness, Information, and Procedures.**

Knowledge of existing flight restrictions and airspace coordination should be improved so that transit through or around an incident's airspace can be performed safely and efficiently by other non-participating fire aircraft, both agency and civil.

**H. Incidents Without TFRs**

For incidents that will generally not have TFRs (e.g., initial and extended attack), or for evolving incidents where a TFR is not yet in place, coordination procedures should be followed.

**I. Non-incident Aircraft With Rehabilitation Teams, Media, or Law Enforcement**  
Non-participating aircraft operating within or near incident airspace should be made aware of communications and flight procedures.

**J. Frequencies**

Frequencies are being changed between the time of dispatch to arrival, or after transitions between teams. This information should be relayed timely to dispatch offices and air attack and air tanker bases statewide. New aircraft assigned should be furnished with accurate information.

**K. Frequency Management and Congestion**

Concise, precise verbal communications needs to be the standard. Use of frequencies, including Air Guard, needs to be understood at all levels.

**L. Maps**

Maps of large incidents should be distributed timely by incident air operations and briefed to air crews.

**M. Air Tacticals Procedures**

Procedures need to be flexible to accommodate each situation but certain procedures need to be implemented and/or strengthened.

**N. Role of GACCs, Dispatch Units, Airbases, Air Tacticals, Pilots, and Incident Team Air Operations**

Duties and responsibilities for airspace coordination, as well as amendment, correction, and transmittal of critical flight information, should be clarified.

**O. Airspace Coordination Specialist**

The role of an Airspace Coordination Specialist, and the trigger points at which this position needs to be ordered, are discussed in Chapter 2.

**II. Briefings And Reports**

Briefings of aircrews should be accomplished on a daily basis, with times adjusted to accommodate non-standard and/or staggered start times due to incident activity. Reports may be used to enhance aviation safety by keeping standardizing information relayed regarding geographical airspace situations.

Air tactical and air tanker base managers and incident helibases should provide sufficient time after or before pre-flight, but well in advance of expected activity, to brief pilots and aerial supervisors. A briefing should be accomplished regardless of level of local activity (due to the mobility of incident aircraft, briefing items should include all information).

## **A. Airbase Briefing**

Standard morning briefing at all airbases, both incident and off-incident, should be conducted and should include airspace coordination information as well as information (frequencies and maps) that enable safe coordination. Additionally, new aircraft from other geographic areas should be briefed by whatever means available (radio, on ground).

## **B. Dispatch Briefings**

Dispatch units should also conduct a morning briefing incorporating applicable parts of the airbase briefing.

The following components should be covered. Briefing on airspace and associated issues are not intended to replace standard briefing formats such as those found in agency or interagency Guides (e.g., Interagency Helicopter Operations Guide Daily Briefing/Debriefing Checklist).

- # General incident situation locally, statewide, and nationally
- # Assignments
- # Daily Airspace Coordination Report
- # Frequencies
- # Discussion of problems and conflicts encountered the day before (or ongoing), along with resolution
- # Safety issues and alerts

## **C. Daily Airspace Coordination Report**

This report and most importantly the briefing of its contents is key to conflict avoidance at all applicable levels and to all appropriate participants. The report may be posted to a GACC or dispatch web site. Depending on the complexity of the current airspace situation, the following components may be covered:

- # Maps of statewide TFRs with incident or area specific maps as needed
- # Table listing TFRs impacts on military or other flight activities, etc.
- # Incident or area-specific airspace procedures
- # Initial Reporting Points
- # Frequency lists
- # Incident Mgt Team Air Operations Organization contact list
- # Known hazards e.g. Logging cable or helicopter operations

#### **D. Distribution of Daily Airspace Coordination Report**

Pilot (both participating and non-participating), DOD, FAA, and agency personnel awareness of airspace coordination information is critical. Airspace coordination and communications information should be distributed statewide to all with a “need to know”.

These include but are not limited to:

- # Air Attack Bases (and Air Tanker Bases not associated with an AAB)
- # Helibases with contract or agency-owned helicopters
- # Dispatch Centers and GACCs
- # Expanded Dispatch Aircraft Desks
- # Incident Bases, Attn: Air Operations Branch Director
- # Neighboring Agencies
- # Agency Aviation Safety Officers
- # ARTCCs, FSS
- # DOD SUA Scheduling Agencies
- # DOD MTR Scheduling Activities for MTRs

Complex situations requiring an Airspace Coordinator assigned to Area Command should refer to Chapter 2, Roles and Responsibilities for Area Command Airspace Coordinator for a further outline of reporting responsibilities.

### **III. Operations Procedures**

There are several guides (Interagency Air Tactical Group Supervisors Guide and Interagency Lead Plane Guide) that specifically outline procedures for ingress and egress into TFRs by assigned aircraft. The following addresses aircraft NOT assigned to the incident:

#### **A. Aircraft Not Assigned To The Incident That Are Flying Near, Transiting or Entering Incident Airspace**

This situation is one where many airspace conflicts occur. Pilots and air crew members of non-incident aircraft are directly responsible for adhering to the following procedures. Dispatchers and unit aviation managers are responsible for ensuring aircraft performing these missions inform pilots and air crews of potential known conflicts (i.e., intrusions into TFR areas).

##### **1. Incidents With a TFR**

It is important that pilots and aerial supervisors of aircraft not assigned to the incident realize that they are non-participating aircraft under FAR 91.137 (a)(2) and fall under the same requirements as general aviation and commercial aircraft. All pilots are responsible for being aware of the TFR NOTAM.

They are responsible for remaining clear of the restricted airspace unless granted permission to enter or transit the airspace by the aerial supervisor in charge (or other coordination facility such as dispatch, who should in turn make contact with the aerial supervisor to obtain permission).

An attempt to cross restricted airspace without making contact and obtaining permission for any reason (including frequency congestion) is not acceptable and will be documented on a SAFECOM as a TFR intrusion.

Even if outside the TFR, a courtesy contact will not only enhance safety but also avoid needless follow up of a perceived intrusion.

**2. Incidents Without a TFR**

For aircraft not assigned to the incident, it is a basic aerial firefighting safety procedure for the pilot to avoid the incident airspace until contact can be made. This is commonly achieved via communication with the unit dispatching the aircraft or the unit with jurisdiction on the incident. Another method should always be contact on Air Guard or VHF-AM 122.925.

**3. Reconnaissance/Detection Aircraft**

These aircraft should always follow standard contact procedures to determine if aircraft are inbound or assigned to incidents, especially along jurisdictional boundaries.

**B. Incident Aircraft Ingress And Egress That Are Flying Near, Transiting or Entering Incident Airspace**

Standard air tactical procedures should be followed as specified in Interagency Guides such as Air Tactical and Lead Plane.

Modifications and enhancements should be implemented as necessary for each situation and/or dependent upon the phase of the incident. The key is to maintain both safety through standard procedures but with the flexibility for the aerial supervisor to implement modifications that are workable in each different situation.

Pilots are responsible for announcing inbound status (identifier, current location, approach direction, altitude, ETA) to aerial supervisor or tactical aircraft on-scene. This should be accomplished when the arriving aircraft is no later than 3-5 minutes out from the outer boundary of the incident airspace. This may be modified when determined necessary by the aerial supervisor to a longer time frame.

Aerial supervisors should relay standard information back to the inbound aircraft: altimeter setting, assigned altitude, other known aircraft, and hazards.

Additional information or direction may include reporting to an Initial Point (IP). An IP is used for conflict avoidance with other aircraft and for the aerial supervisor to establish visual contact. An IP is a physical location (either geographic or coordinates (lat/long or VOR, DME, and BEARING) to which inbound aircraft should report.

There may be more than one IP in an incident. IPs may change over the course of an incident due to changing requirements (size, direction, terrain). The important consideration is that everyone is informed of the IP.

**1. 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, adjacent incident proximity, etc. Once again the key is to establish what is workable and safe, and to make the procedures known among the aircraft and/or between the incidents involved.

**2. Flight Routes To/From An Incident**

Routes should be implemented when conditions warrant either temporarily or for longer periods of time. Such conditions may include poor visibility, coupled with numerous aircraft flying to and from multiple incidents in proximity. Longer-term flight routes should be a joint decision by aerial supervisors, pilots, base managers, and incident air operations personnel. Pilot feedback is critical on this issue. These routes should be communicated to the dispatch and or the applicable Aircraft Desk for incorporation into the Daily Airspace Coordination/Communications Report.

**3. Inbound To An Airbase**

Pilots are responsible for timely notification to Dispatch and/or air attack base of their inbound status.

#### **IV. Establishment of and Communication of Special Airspace Coordination Procedures**

The incident ATGS or AOBD is responsible for relaying special procedures (initial points, flight routes) to dispatch. Dispatch is responsible for relaying this information to the applicable GACC Aircraft Desk for incorporation into the Daily Airspace Coordination/Communications Report (when appropriate). Any modifications should be relayed timely. The primary purpose of this is to ensure that new arriving aircraft are made aware of procedures.

##### **A. Flight Routes Within An Incident**

On smaller incidents where the entire incident can be seen by the aerial supervisor, flight routes are determined through communication between aerial supervisors and tactical aircraft pilots. On larger incidents, flights to/from incident helibases may not be under positive visual control by an aerial supervisor. Poor visibility conditions may also be a factor. However, prior to establishing “hard” flight routes, the positive benefits of known routes should be weighed against the negative aspects of funneling multiple aircraft into one area. If such routes are established, they should be made known to all incident aircraft in morning or initial briefings and should not be included in the Daily Airspace Coordination/Communications Report.

##### **B. SUA Procedures**

Local agreements and procedures with the military may require amendment to ingress/egress procedures described above. These procedures should be published in the Daily Airspace Coordination/Communications Report.

##### **C. Procedures Within Class B, C, or D Airspace**

The establishment of a TFR within this type of airspace requires special coordination between requesting unit, airport tower(s) involved, TRACON involved and the responsible ARTCC.

##### **D. Procedures Where A TFR Has Airport(s) Within It**

The establishment of a TFR whose boundaries incorporate one or more airports requires coordination with the airport managing authority and ARTCC (see Chapter 8). If the airport manager is willing to close the airport to non-participating aircraft, the airport manager must request the closure with the applicable FSS. The FAA will then issue a NOTAM regarding the closure, and white “X” markers should be placed on the runway(s). If the airport cannot be closed, then the TFR will need to be constructed with flight routes excluded from the TFR to allow ingress/egress by non-participating aircraft. These procedures should be published in the Daily Airspace Coordination/Communications Report.

## **V. Frequency Management**

Tactical aircraft frequencies are air-air and air-ground frequencies which are assigned for use by participating aircraft for tactical operations over an incident. The authorized use of these frequencies is for air tactical communications only.

The use of tactical aircraft frequencies combined with the appropriate level of aerial supervision can provide the necessary separation, and positive control of participating aircraft operating within the airspace over an incident.

Utilization and management of tactical aircraft frequencies by participating aircraft is an important component of the MACA program.

### **A. Air-to-Air Frequencies**

Air-air frequencies are typically assigned in the VHF-AM band from \_\_\_\_ through \_\_\_\_\_. These frequencies are used by the aircraft responsible for aerial supervision over an incident for initial check-in with all participating aircraft, airspace coordination, and for providing operational direction and instructions to tactical aircraft.

Some geographic areas, especially California conduct air-air communications on VHF-FM frequencies from \_\_\_\_ through \_\_\_\_\_.

### **B. Air-to-Ground Frequencies**

Air-to-ground frequencies are typically assigned in the VHF-FM band from \_\_\_\_ through \_\_\_\_\_. These frequencies are used for communications with ground forces and the participating tactical aircraft. The aircraft providing aerial supervision can discuss tactics and target acquisition with the ground forces, and the tactical aircraft can also communicate directly with the ground personnel who are requesting the specific missions.

### **C. Flight Following Frequencies**

Flight following frequencies are assigned for the purpose of tracking aircraft from the base of operations to an incident. This is a positive method of communication, usually conducted at 15 minute intervals, which is initiated by the originating dispatch office and continues until the aircraft has made a transition to the incident, aerial supervision aircraft over the incident, or another dispatch office.

Flight following of aircraft by position and heading allows for a more rapid response and narrows the search area should an emergency situation occur, and search and rescue procedures are activated.

Some dispatch offices conduct flight following on local agency frequencies. These are generally shared with ground resources, and other logistical users. Aircraft should be given priority when flight following is being conducted.

#### **D. National Flight Following - 168.650**

Many dispatch offices have the National Flight Following frequency available in their radio systems. When available, this frequency should be used for all aircraft flight following.

National Flight Following should be used by aircraft for position reporting only, and all other tactical and operational communications should be conducted on other frequencies.

#### **E. National Air Guard - 168.625**

This frequency is dedicated for emergency communications for aviation. Restrictions for use are:

- # Air-to-Air emergency, initial contact
- # Ground-to-Air emergency contact, last resort
- # Initial call, recall and re-direction of aircraft when no other contact frequency is available.

#### **F. Frequency Plans**

Many geographic areas annually assign tactical aircraft frequencies which are dedicated for initial attack use only. These are usually depicted graphically on maps as contiguous polygon-shaped “zones” of airspace (based on administrative or physical boundaries), and describe the respective air-air, and air-ground frequencies assigned for each zone.

Dispatch offices utilize these plans to assign the appropriate air frequencies for aircraft responding to initial attack incidents.

#### **G. Frequencies on Large Incidents**

When an Incident Management Team (IMT) is assigned to an incident, air-air and air-ground tactical aircraft frequencies are ordered and assigned specifically for that incident. These frequencies are used for the duration of the incident, and then released when incident air operations cease.

Large incident frequencies are ordered through dispatch channels, and assigned by NIFC. Latitude and longitude coordinates must be provided so that NIFC can coordinate frequency assignments between adjacent or multiple incidents.

#### **H. Complex Airspace and Frequency Management**

When airspace and multiple incident complexity reaches a level where existing aircraft frequency and communication plans are inadequate, an airspace coordinator may be assigned to develop a temporary airspace and aircraft frequency plan for a specific area.

Examples of this type of complexity may be heavy initial attack activity in close proximity to multiple large incidents, multiple TFR's in place, and aircraft responding from bases located in several different geographic areas. The 1999 Nevada response plan, 1998 Florida Response plan and the 1998 Montana/Idaho response plan are all examples of this situation.

## **VI. Readiness and Training**

A strong component of a MACA 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 items to assist an office in assessing their airspace coordination preparedness.

### **A. Maps**

- # They should be up to date and posted or available.
- # Sectionals
- # Aircraft Hazard Maps
- # Computer Aided Maps (ie IAMS, ROSS, etc)

### **B. Publications**

- # They should be current and accessible
- # AP1/B Book and Charts
- # FAR/AIM
- # AFD
- # AP1/A Handbook
- # Airspace Coordination Guide

### **C. Contact Phone Lists**

- # Prepare during the Preseason list prepared (See Appendix J for template)
- # Scheduling Agencies, Scheduling Activities identified
- # FAA contacts identified

### **D. Airspace Identified for Geographical Area**

### **E. LOA's/MOA's Established**

### **F. Forms Accessible**

- # TFR Request Form
- # Check lists

### **G. Applicable Agency Personnel Trained**

- # VOR/DME
- # Lat/Long
- # Airspace Training

## **VII. Preseason Airspace Coordination**

There exists many possibilities to create an airspace coordination program prior to the need to deconflict airspace. Relationships should be established between dispatch and FAA and DoD personnel who interact in an airspace coordination role. The following is a list of outreach possibilities to enhance airspace coordination in a positive and pro-active manner.

### **A. Site Visits**

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

Fly-ins or Air Shows are opportunities for agency personnel to share information about our airspace coordination procedures. This is an outstanding method of reaching out to general aviation pilots to discuss TFRs.

### **B. Videos**

There are two crucial videos currently used by agency personnel.

#### **1. Aviators and Wildfire**

A six minute video developed by the USFS that focuses a message to general aviation about staying away from TFRs.

#### **2. Flying in Special Use Airspace**

An outstanding training video from the FAA that discusses Special Use Airspace and Temporary Flight Restrictions. 14 minutes long and useful for training agency personnel.

### **C. MOU/LOAs**

As discussed in Chapter 12, MOUs or LOAs provide a useful tool for standardizing between agencies current airspace coordination procedures.

### **D. Posters**

There exists several outstanding posters to outreach both DoD and general aviation with our “stay away, stay alive” type message of avoiding TFR’s. Units may also chose to prepare smaller posters for posting at local airports displaying a current TFR.

Figures 7-1 through 7-3 show example of awareness posters.

Figure 7-1

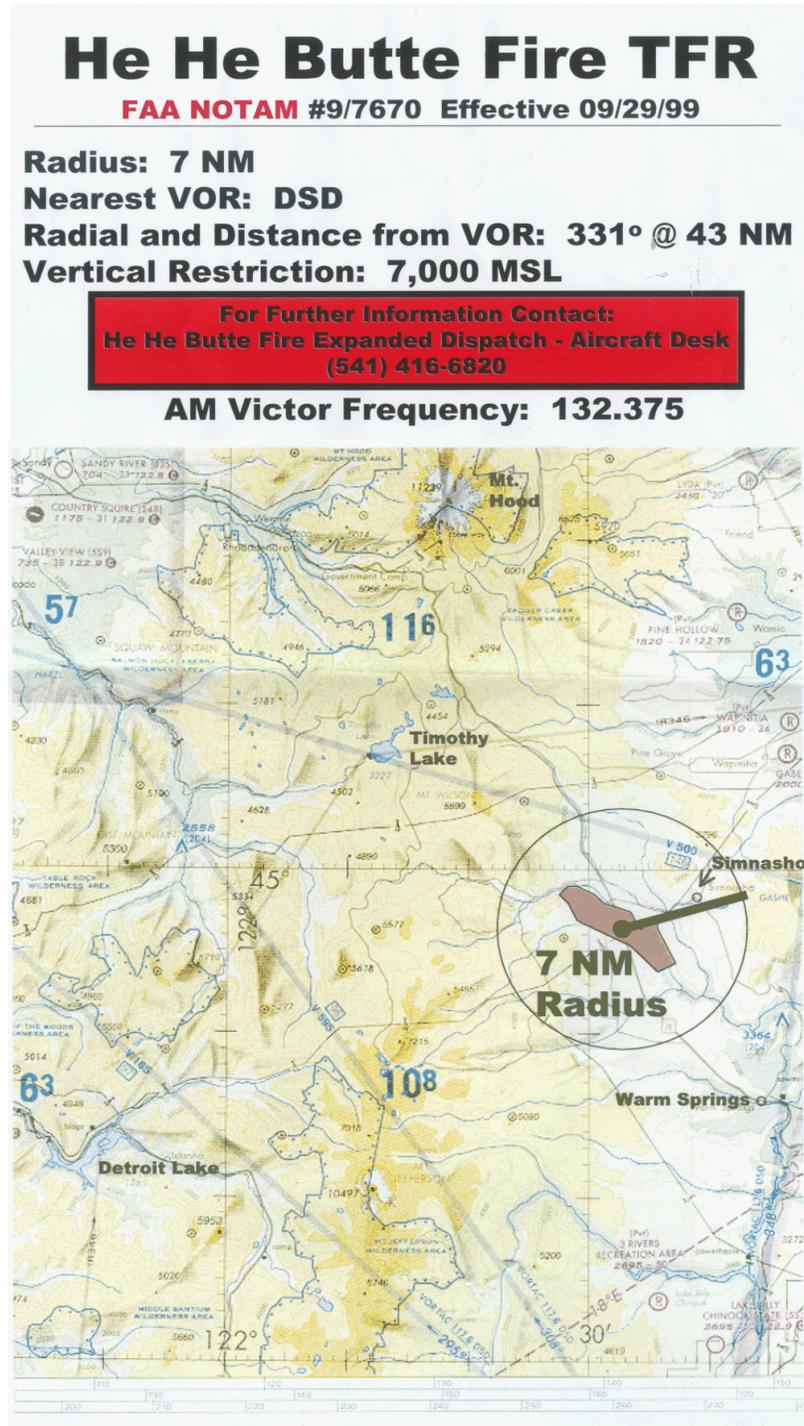


Figure 7-2



Figure 7-3

