

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

SURVIVAL FACTORS / OPERATIONS

WPR11MA454

Attachment 1 – FAA Order 8900, Volume 3, Change 86

(108 Pages)

VOLUME 3 GENERAL TECHNICAL ADMINISTRATION**CHAPTER 6 ISSUE A CERTIFICATE OF WAIVER OR AUTHORIZATION FOR AN AVIATION EVENT****Section 1 Issue a Certificate of Waiver or Authorization for an Aviation Event****3-141 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.**

A. Issue Certificate of Authorization. Enter “1220” in the “Activity Code” box of the PTRS transmittal form and enter “PA” in the “National Use” box if the certificate of authorization (COA) was issued for parachuting.

B. Issue Certificate of Waiver. Enter “1230” in the “Activity Code” box and in the “National Use” box enter “AS” for an air show, “AR” for an airplane air race, and “BE” for any type of balloon event.

C. Complete DD Form 2535. Enter “1231” in the “Activity Code” box and enter “WI” in the “National Use” box if a waiver will be issued and “NW” if no waiver will be issued for the operation requested.

3-142 OBJECTIVE. This section’s task is to determine whether to issue a Federal Aviation Administration (FAA) Form 7711-1, Certificate of Waiver or Authorization, to an applicant for an aviation event. Completion of this task results in the issuance of a certificate of waiver or authorization or the disapproval of FAA Form 7711-2, Application for Certificate of Waiver or Authorization.

NOTE: Appropriate paragraphs in the automated Operations Safety System (OPSS) or Web-based automated Operations Safety System (WEBOPSS) may be used in lieu of FAA Form 7711-1, Certificate of Waiver or Authorization.

3-143 GENERAL.

A. Definitions. Many terms used in this chapter are unique to aviation events, therefore, the following definitions should enhance the understanding of their application:

1) **Aerobatic Box.** The airspace at an air show where participating aircraft are authorized to perform aerobatic maneuvers appropriate to their category. This box begins at the appropriate category I/II/III show line (Figure 3-24).

2) **Aerobatic Flight.** Aerobatic flight is where the pitch attitude exceeds 60 degrees above or below the horizon and/or the angle of bank exceeds 75 degrees in reference to the horizon for all aircraft when conducting the event in accordance with a certificate of waiver or authorization. The definition in Title 14 of the Code of Federal Regulations (14 CFR) part 91, § 91.303 does not apply. Therefore, always waive the portion of § 91.303 that defines aerobatic flight.

3) Air Boss. The individual who has the primary responsibility for air show operations on the active taxiways, runways, and the surrounding air show demonstration area.

4) Air Show. An aviation event defined as an aerial demonstration by one or more aircraft before an invited assembly of persons.

5) Airworthiness Certificate. For the purpose of this chapter, the terms “airworthy” or “Airworthiness Certificate” refer to more than just the United States and International Civil Aviation Organization (ICAO) countries’ standard airworthy aircraft. For a U.S.-registered experimental aircraft this would be a special flight permit, which must be accompanied by operating limitations. Foreign registered experimental aircraft must have the special flight permit with operating limitations and a special flight authorization allowing air show operations in U.S. airspace.

6) Air Show Demonstration Area. The total airspace (lateral and vertical limits) identified by the FAA waiver, temporary flight restriction (TFR), or the Notice to Airmen (NOTAM) issued for an air show (sometimes referred to as the waived airspace).

7) Altimeter Setting. Many performers and jump aircraft may wish to set their altimeters to zero while on the ground to measure height above ground during their performance. This may require a waiver of § 91.121. The inspector-in-charge (IIC) should waive § 91.121 for any event where aircraft involved in that event are departing from a runway at that location. This does not require the affected aircraft to set their altimeter(s) to zero but gives the pilot the option to do so.

8) Approved Maneuver. An AFS-800 approved maneuver or a series of maneuvers. These may include flight over the designated spectator area(s) below 1,000 feet above ground level (AGL), higher speeds for military airplanes, or a maneuver that may involve energy directed at the spectator area that meets safety criteria.

9) Aviation Event. Aviation events include air shows, closed course air races, parachute demonstration jumps, balloon meets, and fly-ins conducted before an invited assembly of persons, for which the FAA issues a Certificate of Waiver or Authorization.

NOTE: This chapter does not address or include aerobatic competitions (see Volume 3, Chapter 5, Issue a Certificate of Waiver or Authorization for an Aerobatic Practice Area or an Aerobatic Contest Box).

10) Aircraft Show Line Categories. Show line categories, speeds, and distances are shown in Table 3-1 below. These speeds are only for determining assignment to a show line, not maximum performing speeds. The following criteria are the basis for the minimum distances in the table below:

a) For reciprocating engine powered airplanes knots indicated airspeed (KIAS) in straight and level flight at 75 percent power at standard temperature and pressure (15°C/sea level) and maximum certified gross weight.

b) For turbine engine powered airplanes (does not include the BD-5J Microjet)?85 percent of the maximum continuous powered straight and level flight KIAS at standard temperature, pressure (15°C/sea level), and maximum certified gross weight.

c) Minimum show line distances are measured from the crowd line to the center of the aircraft closest to any spectator area for Show Line Category II and III aircraft and to the center airplane for Category I airplanes.

Table 3-1, Example of Airplane Show Line Category

AIRPLANE SHOW LINE CATEGORY	AIRCRAFT CHARACTERISTICS*	STANDARD SHOW LINE DISTANCE FROM THE SPECTATOR AREA
I	More than 245 knots (282 miles per hour (mph))	1,500 feet
II	More than 156 knots but 245 knots or less (181-282 mph)	1,000 feet
III (Single reciprocating engine and BD-5J)	156 knots or less (180 mph) or no more than 2,250 pounds gross takeoff weight (GTOW)	500 feet
	* These are not operating limitations	

NOTE: See Table 3-1A for all aircraft categories.

11) Certificate of Authorization. An official document issued by the FAA to permit certain activities that require FAA approval but that does not waive any regulations, for example, parachuting/sky diving demonstrations. (See Figure 3-33 and 3-33A.)

12) Certificate of Waiver. An official document issued by the FAA that authorizes certain operations of aircraft to deviate from a regulation but under conditions that ensure an equivalent level of safety. Section 91.905 lists the sections of part 91 that can be waived. (See Figure 3-32 and 3-32A.)

13) Civil Twilight. Civil twilight in the evening is the time between sunset and when the center of the sun is less than 6 degrees below the horizon. (See subparagraph 3-147N for restrictions.)

14) Control Point. A specified location where the event organizer, a designated representative, or an air boss manages the aviation event. The control point must have a communication system with the capability necessary to control the aviation event.

15) Corner Markers. An easily identifiable marker or landmark from the air, 500 feet or more right and left of primary spectator area along the crowd line from the primary spectator area to provide flybys and performers a 500-foot reference for proper separation from spectators (see Figure 3-24, Figures 3-26 through 27C and Figure 3-29).

NOTE: Markers that may be hazardous to aircraft operations should not be placed on runways, taxiways, or any other operational area. This includes the X on the end of runways to denote runway closure. Place them in a safe area adjacent to the designated spot.

16) Critical Aircraft. That aircraft closest to the primary spectator area in a formation flight.

17) Crowd Line. A physical barrier or a line marked on the ground that serves as a restraining line for designated spectator areas and provides the appropriate safety distances from the aerobatic box and/or show line.

18) Essential Personnel. Individuals authorized to access the flying display area during an aerobatic performance. (See subparagraph 3-145C.)

19) Event Organizer. The person or agency responsible for the organization and conduct of the aviation event.

20) Flyby. A non-aerobatic pass or a series of non-aerobatic passes, performed by one or more aircraft, before an invited assembly of persons at an aviation event while a waiver is in effect. (See paragraph 3-147J.)

21) Flying Display Area. The airspace at an air show where participating aircraft have authorization to perform. This area includes all the aerobatic boxes and show line but does not include ingress/egress routes.

22) Formation Flying. When an aircraft is flown solely with reference to another aircraft and within 500 feet of the referenced aircraft. Air racing and simulated dog-fighting are not considered formation flying.

23) Heritage Flight Program. The United States Air Force (USAF)-approved military and civilian pilots flying formations consisting of USAF, former USAF, and U.S. Army Air Corps aircraft to demonstrate the history of USAF aircraft.

24) Ingress/Egress Routes. Those routes used by air show performers to enter and exit the flying display area.

25) IIC. The FAA aviation safety inspector (ASI) who has primary FAA responsibility for the aviation event. (See subparagraph 3-143D.)

26) Military Jet Demonstration Teams. The sanctioned North American Military jet demonstration teams are the USAF Thunderbirds, the U.S. Navy Blue Angels, and the Canadian Forces Snowbirds.

27) Military Single-Ship Demonstration Teams. A U.S. Department of Defense (DOD) or Canadian Department of National Defense (DND)-sanctioned demonstration team that consists of single aircraft conducting flybys or aerobatic demonstrations of current military fighter aircraft.

28) Night. Night means the time between the end of evening civil twilight and the beginning of morning civil twilight, as published in the American Air Almanac, converted to local time.

29) Official Photographers. Photographers designated by the responsible person as essential personnel to be in designated areas of the aerobatic box during performances (see subparagraph 3-145C).

30) Participant. Any individual specifically involved with, or directly participating in, the waived aviation event.

31) Primary Spectator Area. The main area designated by the event organizer for spectator use. The crowd line creates its boundary and has well defined lateral limits (ends). This is the area from which the public is directed to view the event. There may be more than one primary spectator area.

32) Responsible Person. A person designated by the event organizer to be responsible for all aspects and special provisions of the waiver/authorization. This person must be acceptable to the waiver/authorization-issuing Flight Standards District Office (FSDO) as being knowledgeable concerning the terms and provisions of the certificate of waiver/authorization for this aviation event. The responsible person will be responsible to the FAA for the safe conduct of the event.

33) Secondary Spectator Area(s). Any area, not designated as a primary spectator area, where people have a natural tendency to gather to observe the event. This includes, but is not limited to, private property or property not under control of the event organizer, public roads, and private access roads.

34) Show Center. A visible reference point that denotes the center of the flying display area.

35) Show Line. A line on the surface of the ground or water, marked to be clearly visible to pilots from the air, intended to enhance pilot orientation during the performance. The show line provides the performer with a clear visual reference to the minimum safety distance applicable to the category of the maneuvering aircraft being flown (See subparagraphs 3-147A, C through F.)

36) Tailhook Legacy Flyover Program. The United States Navy (USN)-approved military and civilian pilots flying formations consisting of sanctioned USN and former USN aircraft to demonstrate the history of U.S. naval aviation.

37) Web Sites. The public Internet air show site is available at: <http://www.faa.gov/about/initiatives/airshow>. The FAA employee air show site is available at: <http://intranet.faa.gov/FAAEmployees/org/linebusiness/avs/offices/afs/programs/airshows/>.

B. Regulatory Authority. Flight Standards Service (AFS) has the authority to grant or deny waivers of the regulations listed in § 91.905 for aviation events. The FSDO that has responsibility for aviation events conducted at the proposed site processes requests for waivers or authorizations.

1) Scope of Waivers.

a) Waivers of 14 CFR sections and the attendant special provisions may vary in scope depending on the regulations that an applicant requests to be waived and will vary depending upon the type of aviation event and the location. Some events require nothing more than waiving § 91.303(e) to permit aerobatic flight at less than 1,500 feet above the surface. Other events that consist of flybys and static displays may only require waiving sections of part 91 for aircraft speed limitations, minimum safe altitudes, or limitations while operating in the vicinity of airports or within Class B, C, D, or E airspace.

b) Waivers of the basic visual flight rules (VFR) weather minimums specified in § 91.155 may be considered in areas where the entire event can be conducted with air traffic control (ATC) providing separation between participating aircraft and nonparticipating aircraft. This will mean that the entire air show display area for the affected aircraft must be within a TFR, Class C, or Class D airspace.

NOTE: Class B airspace is normally “Clear of Clouds” for VFR operations.

2) Section 91.905 establishes a list of rules subject to waivers. Some of the subsections of the mentioned sections may or may not need to be waived. For example, see note below on § 91.119. There should be a corresponding special provision that gives the conditions that must be followed for each section and/or subsection to be waived to maintain an equivalent level of safety. Another example would be § 91.117. Aircraft speed may be waived but that waiver of airspeed would have a limitation on maximum airspeed, and the limitations on where that waiver is valid would be in the special provisions attached to the waiver.

NOTE: Section 91.119(a) will not be waived for air show demonstration purposes. Section 91.119(b) and (c) may be waived only when the conditions stated herein are met.

C. Program Coordinators. A national air show coordinator is designated in FAA headquarters by AFS-800. The regional Flight Standards Division manager designates regional air show coordinators. The national coordinator is responsible for overall program monitoring and coordination of all information and communications between DOD, FAA regions, and the public. The regional coordinators are responsible for monitoring the same programs in that region and for coordinating policy and information between FSDOs and the national coordinator. The national and regional air show coordinators function in an advisory capacity. IICs making

onsite evaluations are responsible for technical determinations as to the issuance or denial of a request for waiver.

1) The IIC will elevate any issues requiring clarification or that may be of regional or national interest, such as military demonstration team participation, to the regional air show coordinator. The regional coordinator will determine the level of regional participation. A list of regional coordinators is available on the public access site at <http://www.faa.gov/about/initiatives/airshow/>. FAA IIC and other FAA employees may use the following site: <https://intranet.faa.gov/FAAEmployees/org/linebusiness/avs/offices/afs/programs/airshows/>. The regional coordinator assists in resolving issues and coordinates with the national coordinator as necessary.

2) The national coordinator makes recommendations regarding policy changes. When policy change is not required, provide clarification back to the regional coordinator.

a) Regional supplements to aviation event policy are not permitted (see Volume 1, Chapter 1, Section 1, subparagraph 1-3C).

b) The regional coordinator will receive reports of initiation of any enforcement investigations, and he/she will coordinate the necessary response with the national coordinator as early as possible in the investigation.

c) All accidents or incidents occurring at an aviation event will be reported immediately to the regional coordinator, who will coordinate with the national coordinator.

D. IIC. To enable the FAA to most effectively manage the aviation event program, FSDO managers will assign an IIC to process an application for a waiver or authorization for an aviation event. The IIC oversees or personally conducts the following activities:

- Site feasibility study.
- Participation in the preseason evaluation meeting.
- Evaluation of the application for waiver or authorization.
- Recommendation for issuance or denial.
- Prepares a list of Special Provisions appropriate for the event in compliance with current FAA Order 8900.1 guidance.
- Surveillance of the aviation event.

E. IIC Qualifications. The IIC assigned this task and the subsequent surveillance must have completed the applicable on-the-job training (OJT), and must have participated in the issuance of at least three certificates of waiver and surveillance of at least three aviation events as a trainee with a qualified IIC. For events in which a military aerobatic demonstration team performs, the IIC must have satisfactorily completed OJT for a military aviation event, including participation in a site feasibility determination required by DOD, a preseason evaluation meeting, and a waiver preparation for a military demonstration team.

F. Qualified Inspector Not Available. If the FSDO does not have an inspector who meets the above qualifications, the FSDO manager will contact the regional air show coordinator to request an inspector who is qualified to perform the tasks of an IIC. After the regional

coordinator identifies an available IIC, FSDO managers should work out the arrangements necessary to accomplish the task and provide OJT if an ASI is available. A PTRS record must be made documenting the need for outside resources.

G. Surveillance of an Aviation Event. Surveillance of an aviation event is the responsibility of the FSDO manager. Preferably, the IIC who processed the application for a waiver or authorization should monitor the event. Consider additional resources for high profile events or large aviation events. Any event not monitored by an IIC must be coordinated with the regional air show coordinator well in advance, and the outcome documented in PTRS. (See Volume 6, Chapter 11, Section 10, Surveillance of an Aviation Event, paragraph 6-2371.)

H. Surveillance of an Aviation Event—Inspector Resources Not Available. It is always preferred to have a monitor at each event, although in rare circumstances it may not be possible. The FSDO manager, along with the regional air show coordinator should consider the following as part of the decision making process and assessing the risk:

- What is the size of the event? Length, number of air show acts and static display, number of spectators,
- Has there been a history of problems with the management of the event?
- Is it a military air show?
- What is the previous safety history of this event?
- Is the event well planned and are experienced personnel in key positions, (e.g. event organizer/responsible person, air boss, performers, Crash Fire Rescue personnel, etc.)?
- What is the experience level of the responsible person/ event organizer and air boss?
- Is the emergency plan well designed and adequately staffed for this event?
- Is the plan to manage spectators and sterile areas well designed and adequately staffed for this event?
- Is a TFR issued for the event,
- Is ATC managing the movement of aircraft? Are they on-site?
- How many FAA monitors would this show normally require?
- Will you send an Airworthiness Inspector to inspect aircraft prior to event?
- Will you send an ASI (Operations) to check the performers credentials prior to event?
- Is it possible to attend first day to ensure compliance with waiver and special provisions?

3-144 APPLICATION FOR A CERTIFICATE OF WAIVER OR AUTHORIZATION.

A. FAA Form 7711-2, Certificate of Waiver or Authorization Application. An inspector who reviews relevant information about the proposed operation and site suitability processes applications for aviation events should use FAA Form 7711-2 (Figures 3-32 through 3-33A). Not all items on the form may apply to each event. In other cases, additional information may be required. The FSDO manager has the authority to sign a waiver or authorization when the application is approved.

1) Submit applications for air shows or air races at least 90 days before the date of the event. Only after the event organizer has met all requirements, approval or denial of the application will be completed within 30 days of receipt by the FSDO.

2) Present applications for parachute jumps made over or into a congested area or open-air assembly of people at least 10 working days before an event. Completion of an application's approval or denial must be done within 5 working days of receipt by the FSDO.

3) TFRs are requested in accordance with § 91.145. TFRs should be requested about the same time the application for waiver is made and will be processed in accordance with the procedures established in subparagraph 3-144E4).

4) The completion and submission of FAA Form 7711-2 and all supporting documents are solely the applicant's responsibility.

5) Upon approval, FAA Form 7711-2 and its attachments become a part of FAA Form 7711-1 (Figure 3-34).

6) The applicant must attach current maps, charts, diagrams, or other data appropriate to the activities and locations to FAA Form 7711-2 upon application for a certificate of waiver or authorization.

7) For most events, the supporting data must address the following major areas:

a) Diagrams and descriptions of spectator areas which restrict the public from:

- The flight areas;
- The active runways;
- The taxi and run-up areas; and
- Other active areas, such as emergency or police helipads, parachute landing areas, pyrotechnic areas, etc.

b) Supporting documents should describe the methods that will be used to ensure security of areas outside of the designated spectator area, especially the area under the aerobatic maneuvering area.

8) Except for official military pilots, each pilot flying a civil aircraft must have the proper certification and rating for the aircraft to be flown. In addition, each civilian pilot who performs aerobatics must possess a statement of aerobatic competency (see subparagraph 3-145A) including foreign civil airmen (Figures 3-35 and 3-36).

a) Non-airmen participants, such as parachutists, can be accepted on the basis of a license issued by the United States Parachute Association (USPA), similar organizations or equivalent qualifications acceptable to the FAA. The FAA does not require certification of operators of ultralight vehicles, wing walkers or trapeze occupants, ribbon-cut personnel, drivers of ground vehicles for a car-to-plane transfer, and other non-airmen participants. For unmanned air vehicle operations, contact the regional coordinator for support.

b) Except for official military aircraft, each aircraft flown in an aerial demonstration must be properly certificated and have documentation in accordance with the procedures established in subparagraph 3-145F indicating current inspections, Airworthiness Directives (AD) and time limitations are appropriate for the aircraft to be in an airworthy condition.

B. Assisting the Event Organizer with Form 7711-2. The current edition of FAA Advisory Circular (AC) 91-45, Waivers: Aviation Events, or AC 105-2, Sport Parachute Jumping, as appropriate, provides most information necessary to plan and conduct a safe event. You may obtain these documents and other pertinent information from the FAA at <http://www.faa.gov/about/initiatives/airshow/>. FAA inspectors can obtain additional information at <https://intranet.faa.gov/FAAEmployees/org/linebusiness/avs/offices/afs/programs/airshows/>.

1) Thorough planning has a direct bearing on the success and safety of any event. In larger events, the event organizer should be encouraged to appoint a responsible person (see subparagraph 3-143A32)) to develop a detailed plan for all facets of the event regarding the FAA waiver or authorization. The event organizer and/or responsible person must understand that a waiver is only issued after the determination that a proposed event can be conducted safely and in the best interest of public safety. The inspector should direct the event organizer or responsible person to the detailed guidance in this chapter and ensure that the following subjects have been addressed:

- Type of event,
- Each act's support and airspace requirements and eligibility of participants and aircraft (military/civil),
- Military aircraft performances,
- Parachute demonstrations,
- Site selection (airports, fairgrounds, other sites),
- Airspace considerations and issuance of a TFR,
- Minimum safety distances and altitudes, and
- Event management.

2) The experienced event organizer is generally well acquainted with the requirements and procedures for obtaining the waiver or authorization and will usually appoint a responsible person to attend to areas regarding the waiver or authorization. Ask first time event organizers to review and have a good understanding of the current edition of AC 91-45 or AC 105-2, which contain important information for planning and conducting safe aviation events, because they may not be aware that a waiver or authorization is required. These ACs also provide information on how to request FAA Form 7711-1. First time event organizers are strongly encouraged to contact industry organizations (e.g., the International Council of Air Shows (ICAS)) for air show support and/or training.

C. Completion of Form 7711-2. (See Figures 3-32 and 3-32A.) Upon receipt, review the application for obvious discrepancies. If discrepancies exist, arrange a meeting with the applicant to resolve the issues to mutual satisfaction. The applicant must revise the information he/she submitted on FAA Form 7711-2; the FSDO will not alter it.

1) Items 1 and 2. An organization does not sponsor every air show. An individual may sponsor an event. If the applicant represents an organization, the organization's name should appear in Item 1. The name of the individual and his/her position or authority to represent the organization (i.e., the responsible person) should appear in Item 2. If the applicant is not representing an organization, "N/A" should be entered in Item 1 and the applicant's name entered in Item 2. A responsible person is one who has demonstrated to the FAA knowledge concerning the terms and provisions of the certificate of waiver/authorization for this aviation event. The responsible person will be responsible to the FAA for the safe conduct of the event.

2) Item 3. Permanent Mailing Address. The applicant should indicate the permanent mailing address of the organization named in Item 1 or the individual named in Item 2.

3) Item 4. Pertains to Banner Towers only. Aviation events should enter "N/A."

4) Item 5. Pertains to Banner Towers only. Aviation events should enter "N/A."

5) Item 6. Reference § 91.905 for a list of rules subject to waivers. Ensure that the applicable rules to be waived have been requested. An application for a parachuting operation should state that authorization is requested in accordance with § 105.21 and 105.25.

6) Item 7. It may be sufficient for the applicant to use the terms air show, parachute demonstration jump, or air race to describe the events. However, it would be helpful for the applicant to fill in as detailed a description as possible if the event is an air show or air race; for example, enter the category of aircraft to be flown, in addition to make and model, if known. (See Figure 3-32, Item 5.)

7) Item 8. The applicant should describe the air show demonstration area as a rectangular, cubic, or cylindrical cell of airspace; and the aerobatic box as a cube or rectangle bounded by a runway or other definable geographical reference, a lateral point, and up to a particular altitude above ground level. This can be over land or water.

a) For off-airport sites, the boundaries should be described using rivers, highways, railroads, or other easily identifiable landmarks or markers.

b) For an air show, the applicant should attach current, properly marked maps, drawings, or photographs of the planned area of operation (satellite photographs may be substituted for topographic charts (from <http://maps.google.com>, <http://www.mapquest.com>, etc.). The applicant will include as much of the following data as known at the time of application. The IIC will review the documentation for acceptance. Any depiction submitted must include indications of the following:

- The location and marking of the show lines.
- The location of the boundaries of the air show demonstration area.
- The location of the boundaries of the flying display area and/or aerobatic box.
- The location and type of corner markers if flybys are anticipated.

- The location of the primary spectator area and the types of barriers used, including gates.
- The location of the emergency vehicles and medical facilities.
- The location of the emergency access surface routes to and from the event site.
- The location of the aircraft movement areas.
- The location of the parachuting landing area.
- The location of the static display aircraft parking areas.
- The location of the air show aircraft parking areas.
- The location of the fly-in aircraft parking areas.
- The location of the refueling areas.
- The location of the helipads.
- The location of the air show control point.
- The location of the pyrotechnic areas.

c) Applicants should note in Item 7 if supplemental information is attached.

d) The site layout must depict that the air show demonstrations or air show acts can be accomplished at that site. If an air show demonstration or act cannot fit within FAA distance criteria, or if congestion or new development around the proposed site impedes those criteria, the site is not appropriate for that demonstration or act.

8) Item 9. Inspectors can eliminate the need for the applicant to resubmit applications for an additional authorization by advising applicants to list alternative dates on the initial application. This avoids confusion and reduces the number of applications that must be submitted by the event organizer.

9) Item 10. The initial application does not need to list specific performers/aircraft. The application may be accepted with a notation in Item 8 that a list will be provided at a later, specified date and time. The list should eventually include all performers and aircraft (civilian and military) and parachute teams (civilian and military). A notation stating the show line category must be annotated with each make and model aircraft. Once the list has been supplied, may be amended by the responsible person and resubmitted to the IIC for approval. Performers added on the day of the event must show proof of appropriate qualifications that the aircraft is airworthy, and a determination must be made that the performance can be conducted at that show site.

10) Items 11 and 12. This section requires the name and address of the event organizer. The event organizer of an air show may be an individual, a group of individuals, or an organization. The event organizer of an air show may appoint a responsible person that has the overall responsibility for the conduct of the air show in a safe manner and in accordance with the conditions contained in the certificate of waiver or authorization issued for the air show. The event organizer may delegate to other persons the authority to organize and control particular aspects of the event. At a small event, one person may be able to coordinate more than one activity, while at a large event, a committee of persons delegated by the appropriate authority may control an activity.

11) Item 13. There is no specific requirement for the use of uniformed police or security guards. The need for policing depends upon several factors that must be discussed with the IIC to ensure adequate crowd control. However, it is highly recommended that uniform clothing be worn (high visibility T-shirts, hats, etc.) by individuals performing crowd control or other official duties.

a) The event organizer must ensure that the air show demonstrations are conducted safely and without creating a hazard to any non-participants or spectators. It is imperative that all areas adjacent to the air show site containing homes, factories, major highways, traveled thoroughfares, or any occupied vessel, vehicle, or structure be carefully evaluated before making a final decision for site selection, and that these areas can remain sterile if their location is under the aerobatic box.

b) With respect to crowd control, it is the event organizer's responsibility to ensure that all reasonable efforts are made to confine spectators to the spectator areas, ensure that sterile areas are evacuated and remain sterile, and to present a plan to the IIC in sufficient detail that specifies how this will be accomplished and who is responsible to police the aviation event. The application may be accepted with a notation in Item 13 that a written plan will be provided at a later date, specified date and time.

12) Item 14. Emergency facilities have caused problems for event organizers. As previously noted, the application serves as an all-purpose form and contains items that may or may not be appropriate to emergency facilities. Some applications have been erroneously denied because the boxes for physician, ambulance, and fire truck were blank. Encourage every air show event organizer to provide emergency medical service even though this service may not be utilized. Many event organizers prefer to have the local fire department's emergency rescue squad, paramedics, or emergency medical technicians at their show rather than a physician.

NOTE: For balloon events, consult the guidelines for emergency procedures listed in paragraph 3-153 when considering which boxes to check in Item 14.

13) Item 15. In this block enter a description of method for controlling air traffic (AT) and potential alternative communication methods. For example:

a) Although every aircraft in the event may be equipped with a two-way radio, a visual ground-to-air emergency signal must be provided and described in the application.

b) If a scheduled air carrier serves an airport that is the site of an aviation event, arrangements must be made for the arrival and departure of such aircraft. It is usually adequate to schedule a break in the activities to allow for scheduled arrivals and departures. The event organizer should complete prior coordination with the air carrier and ATC.

c) Request for TFRs, as authorized under § 91.145, if applicable. Add notation in Item 15 if request initiated.

d) List ATC facilities, frequencies, and contacts.

14) Item 16. The FAA must see a proposed schedule of events to evaluate the application. It should contain at least a general description of the types of events and their approximate sequence in the show. The application may be accepted with a notation in Item 16 that a final schedule of events will be provided at a later, specified date and time.

a) The schedule should identify the aircraft and expected performers in the approximate sequence of appearance as best as possible at the time. During the event, the scheduled order of appearance may change because of weather, mechanical problems, or other factors at the discretion of the air boss.

b) Any demonstration or act added to the air show schedule requires notification to FAA and should be submitted at the earliest opportunity (see subparagraph 3-144C6, item 8). Cancellation of an air show demonstration or act does not require advance notice, unless it has a significant impact on the event (e.g., cancellation of a military demonstration team would require notification, as would the cancellation of the entire event).

D. Temporary Practice Areas. During the air show season, the FSDO may be called upon to issue a waiver for the establishment of a temporary aerobatic practice area.

1) Inspectors should encourage event organizers to apply for a temporary practice area for an associated air show as part of that air show waiver request, if one is desired. This will provide participating performers with a convenient and safe area in which to practice their aerobatic performances.

2) Although this will be a separate waiver, which becomes effective as much as 7 days immediately before the event, it should terminate on or before the same date and time as the event waiver.

3) The actual air show site may be suitable as a temporary practice area if it is a controlled environment and there will be no conflict with other nonparticipating aircraft. The effective times must be thoroughly coordinated with the pertinent AT facilities before approval and issuance of the waiver.

4) The temporary practice area should be established no more than 20 or 30 miles from the actual air show site.

5) The responsibility for site selection, coordination, approvals, application, and oversight of the temporary aerobatic practice area rests solely with the air show event organizer.

NOTE: Temporary aerobatic practice areas are excluded from Order 1050.1, Environmental Impacts: Policies and Procedures, due to their temporary nature.

E. Coordination Requirements.

1) AT Coordination. Any request for a waiver or authorization for an aviation event or fly-over not as part of an aviation event requires coordination with the appropriate ATC facility. Any special conditions considered necessary by the Air Traffic Service (ATS) Area will be made a part of the certificate of waiver or authorization in the special provisions.

2) Special UHF/VHF Frequency Requests. Requests for special ultrahigh frequency (UHF)/very high frequency (VHF) frequencies for air show usage should be made by the sponsor or responsible person to the AT facility having jurisdiction over the airspace where the air show will take place.

3) FAA Airports. Any event organizer who requests a waiver for a public aviation event on an airport certificated in accordance with 14 CFR part 139 must coordinate with the appropriate FAA airport district office (ADO) and receive approval for the event ground operations plan before issuance of FAA Form 7711-1.

a) Encouraging event organizers to include airport management in the coordination will greatly facilitate the process. These steps will facilitate the resolution of any conflicts with ARP policy/regulatory requirements relative to part 139. The ground operations plan includes the necessary changes that must be addressed for security. ARP is responsible for ensuring any necessary changes to the security plan are coordinated with FAA security before approval. ARP-1's approval of the ground operations plan is generally separate and distinct from the review and approval of the overall air show layout (primary spectator area, show line(s), takeoff/landing runway, etc.) that is the responsibility of the waiver-issuing FSDO.

b) Any limitations or special provisions considered necessary by the ADO will be made a part of the certificate of waiver. As part of their normal program responsibilities, FAA ADO inspectors may from time to time request information concerning aviation event activities at airports other than those certificated in accordance with part 139.

c) ARP has designated lead airport inspectors in each ARP regional office as the approval authority for this approval. Affected air show sponsors should call the appropriate regional office for coordination. If unable to reach that office, call the national ARP point of contact. The list of regional offices is found on the Internet at http://www.faa.gov/airports/news_information/contact_info/regional/.

4) TFR. A TFR is an area designated to enhance the protection of persons and property on the surface or in the air, to maintain air safety and efficiency, or to prevent the unsafe congestion of aircraft in the vicinity of an aviation event. The responsible person or air boss must request a TFR not FSDO personnel. The procedures for requesting a TFR are found on the following Web site: <http://www.faa.gov/about/initiatives/airshow/>.

a) Aerial demonstrations contained entirely within a Class B, C, or D airspace area should not request the issuance of a TFR under § 91.145.

b) Requirements for issuance of a TFR NOTAM in accordance with § 91.145

- Any segment of the requested airspace for the aerial demonstration for aircraft exceeding 200 knots indicated airspeed (KIAS) is outside of Class B, C or D airspace;
- Military aircraft are conducting aerobatic demonstrations;
- Civilian aircraft that operate in excess of 200 knots are conducting aerobatic demonstrations; or

- Sanctioned military parachute demonstration teams are performing.

c) TFR issued will reflect the dates, times, and lateral and vertical limits of the air show display area for the aerial demonstration for which a certificate of waiver or authorization (FAA Form 7711-1) has been issued.

1. VFR and instrument flight rules (IFR) AT (not specified on the waiver) may be authorized to operate within the designated airspace area published in the TFR NOTAM, when the following conditions are met:

The controlling ATC facility or air boss (if authorized by ATC) grants authorization,
The air boss has coordinated the procedure with the IIC, and
The TFR NOTAM specifies the frequency to contact ATC for an authorization.

2. Cancellation of a waiver and TFR NOTAM must be coordinated. The Responsible person or air boss must coordinate cancellation with the controlling ATC facility and the IIC. The procedures can be either pre-coordinated or established at the time of cancellation.

5) Class D NOTAM. Issue a Class D NOTAM for any aerial demonstration that does not require a TFR. A Class D NOTAM does not prohibit transient aircraft from entering the airspace. It is only a notice for non-participating aircraft that the airport is closed and the purpose of that closure.

6) Waiver of § 91.155 Requirements for VFR.

a) Section 91.155 authorizing operations “clear of clouds” is waived under the following circumstances:

1. Aerial demonstrations are conducted entirely within Class C or D airspace where ATC communication is maintained (Class B is normally clear of clouds); or

2. Aerial demonstrations that are conducted within the boundaries of a TFR issued for that event and ATC communication is maintained.

b) Aerial demonstrations conducted at night must comply with all of § 91.155.

3-145 PARTICIPANT AND AIRCRAFT ELIGIBILITY.

A. Aerobatic Competency Documentation.

1) All civil pilots who perform aerobatic maneuvers in any aircraft where the pitch angle or bank angle exceeds 90 degrees must possess a valid FAA Form 8710-7, Statement of Aerobatic Competency, or Transport Canada Form 26-0307, Statement of Aerobatic Competency (Figures 3-35 and 3-36).

2) All civil pilots who perform maneuvers in excess of 60 degrees but not more than 90 degrees of pitch, and/or more than 75 degrees but not more than 90 degrees of bank that do

not meet the requirements in subparagraph A1) must have a logbook endorsement or a competency letter issued within the past 24 calendar-months after complying with the following:

a) Have successfully completed a flight and ground review by a DPE, FAA Operations Inspector, ICAS or Experimental Aircraft Association (EAA) aerobatic competency examiner possessing authorization to administer this test in that particular airplane or helicopter.

b) The endorsement or letter states that the pilot may fly maneuvers up to 90 degrees of pitch and/or 90 degrees of bank in reference to the horizon (see Figure 3-37). The endorsement is limited to the altitude demonstrated but not less than 200 feet AGL. The testing standards for this endorsement are as follows:

1. For 90 degrees of bank endorsement the applicant must demonstrate a roll to 90 degrees from the horizon and return to level without loss of altitude and within 10 degrees of the predetermined roll out heading.

2. For 90 degrees of pitch up, the applicant must demonstrate a pitch up to 90 degrees from the horizon starting at the lowest altitude authorized but never less than 200 feet AGL. This pitch up will terminate at a predetermined airspeed or altitude as determined by the examiner.

3. For a 90 degrees of pitch down, the applicant must demonstrate a pitch down to 90 degrees and recover at a predetermined altitude but never lower than 200 feet.

4. The applicant must demonstrate knowledge of show line orientation and proper distance's from spectator areas.

a. Demonstrate ability required to reposition the aircraft from a maneuvering pass;

b. Realign 180 degrees for the next pass; and

c. Align the flight path so as not to direct energy toward the primary spectator area.

5. For any demonstrations, at no time may the outcome of the maneuver be in doubt.

6. The applicant may only be endorsed for the altitude demonstrated but not less than 200 feet

3) All limitations on the document listed in subparagraphs A1) or 2) above must be followed. Aerobatic maneuvers and sequences/performances that contain aerobatic maneuvers must be initiated and completed at or above the altitude listed in the limitations on the Statement of Aerobatic Competency (SAC). Non-aerobatic fly-bys may be performed below the altitude limitation listed on the SAC only before or after the sequence/performance is completed. The performer may not interrupt an aerobatic sequence/performance to perform a non-aerobatic fly-by below the altitude restriction.

4) Upon request of the FAA, civil aircraft pilots must show evidence of performing or practicing their performance(s) within the previous 15 days.

B. Required Crewmembers. With the exception of stunt persons, the special provisions of an air show waiver provide that only required crewmembers by aircraft type design be carried on any civil aircraft engaged in an aerial demonstration. For additional persons necessary for safety to be on board a performing civil aircraft, the situation must meet the following conditions and be approved by the IIC:

1) Each crewmember must be on board to fulfill a definite safety function, such as, but not limited to:

a) A one-time show site checkout for a qualified pilot who is unfamiliar with the site;

b) A qualified pilot flying cover for closed course air racing;

c) A qualified person who is required to operate aircraft systems during normal or emergency conditions in flight; or

d) A qualified pilot obtaining experience before inclusion as a non-aerobatic aerial demonstration team member.

2) Each pilot must be current and have the proper qualifications for the specific make and model of a civil aircraft.

3) Each pilot must hold a statement of aerobatic competency or aerobatic endorsement when occupying a seat of an aircraft with functional dual controls for all three axes and aerobatic flight is conducted.

4) Each pilot in command (PIC) must hold a non-aerobatic formation credential when occupying a seat of an aircraft that has functional dual controls for all three axes when in a formation flight and aerobatic flight is not conducted.

C. Essential Personnel Requirements. Examples of essential personnel as determined by the IIC would include, but are not limited to: Crash, Fire and Rescue (CFR) personnel, FAA personnel, pole holders, pyro-technicians, essential support crew, other performers, official photographers or taxiing aircraft associated with the event. Essential personnel must meet the following conditions:

1) Have a safety briefing including ingress and egress from the aerobatic box;

2) Wear high visibility clothing that will easily identify them as essential personnel when in the box; and

3) Official photographers may not exceed the number agreed upon by the responsible person and the IIC to be in the specified areas at one time.

NOTE: Essential personnel do not include news media or photographers (other than official photographers) for the event.

D. Aerobatic Formation Flight. Perform formation aerobatics where the angle of bank exceeds 60 degrees and/or the angle of pitch excess 45 degrees only if the following conditions are met:

- 1) The members of the aerobatic team must have performed together in 10 aerobatic performances over the preceding 12 months; or
- 2) When the team members have flown less than 10 aerobatic performances in the past 12 months, the team must be able to document 30 aerobatic practice sessions or combination of 30 practice sessions and air show performances as a team over the preceding 12 months in the performing aircraft type; and
- 3) All persons conducting formation aerobatics must have demonstrated or substantiated their skills and have the formation aerobatics notation placed on their statement of aerobatic competency.

E. Non-Aerobatic Formation Flight. Each civil PIC who wishes to conduct non-aerobatic formation flybys where the angle of bank does not exceed 60 degrees or 45 degrees of pitch in the air show display area must meet the following:

- 1) Be in possession of an FAA recognized current and valid industry formation flying card.
- 2) Attend a briefing given by the flight leader of the proposed flight;
- 3) The briefing in subparagraph E2) above must meet the requirements of the industry formation group that issued the formation flying card of the formation flight leader;
- 4) The responsible person must provide the IIC a list of the pilots flying in the formation.

NOTE: Formation training will not be conducted during the air show.

F. Aircraft Eligibility. To be eligible to participate in an aviation event, an aircraft must be in an airworthy condition. The waiver or authorization's named responsible person is responsible for ensuring that the participating aircraft have the required documentation to show the aircraft is in airworthy condition.

- 1) To ensure that the aircraft participating in an aviation event are airworthy, an IIC or his or her representative should examine the general condition of the aircraft and required aircraft documents, and determine if the aircraft has met the specified inspections.
- 2) The ASI should use one of the following methods to determine compliance with required inspections:

- a) Review of the aircraft's maintenance records (logbooks); or
- b) Review of a current and valid form supplied by the owner/operator.

1. The completed form must be similar to the sample FAA Aircraft Inspection and Status Form (Figure 3-38).

2. An appropriately qualified airman who holds a mechanic or repairman certificate or an Inspection Authorization (IA) must sign the form.

3. The ASI who inspected the aircraft and determined it was airworthy may sign the form.

4. If an ASI has previously signed off on this form, an aircraft inspection is not required.

3-146 AIR SHOW AIRSPACE REQUIREMENTS. Issue FAA Form 7711-1 to an event organizer. It specifies a geographic area, both lateral and vertical, where air show demonstrations are authorized. This area could be quite large (e.g., 10 nautical mile (NM) radius of an airport from the surface up to 18,000 feet mean sea level (MSL) or rather small (e.g., 2 NM radius up to 3,000 feet MSL), depending on the type of air show demonstration planned. In determining where aerobatics will be performed within the geographic area specified on FAA Form 7711-2, the event organizer selects a site that will accommodate all the specific types of air show demonstrations without detracting from safety or creating a hazard to any non-participants or spectators. It is imperative that all areas adjacent to the air show site containing homes, factories, major highways, traveled thoroughfares, or any occupied vessel, vehicle, or structure be carefully evaluated before making a final decision for site selection. An environmental review in accordance with the current edition of Order 1050.1 is not required due to the temporary nature of a waiver for an aviation event. You must identify the following applicable items for an air show :

- Air show demonstration area,
- Show lines,
- Flying Display Area,
- 500 feet corner markers,
- Restrictions to ingress/egress routes (noise sensitive areas, obstructions, etc.), and
- Designated spectator areas.

3-147 MINIMUM SAFETY DISTANCES AND ALTITUDES. This paragraph provides the minimum safety distances, both horizontal and vertical, which must be maintained between aircraft in flight and the primary spectator area, secondary spectator area and occupied buildings during an air show.

A. Show Lines. For aerobatic and other flight demonstrations, an aerobatic box and show lines must be established at prescribed minimum distances from the designated spectator areas. The appropriate performers must be able to easily identify these lines.

Table 3-1A, Minimum Show Line Distance From Spectator Areas, Congested Areas and Occupied Buildings by Aircraft Category

Minimum Show Line Distance from Spectator Areas, Congested Areas and Occupied Buildings	Aircraft Category or Aircraft Type	Demonstration Maneuvers Authorized
1,500 feet	Category I Aircraft	Aerobatic maneuvers
1,000 feet	Category II Aircraft	Aerobatic maneuvers
1,000 feet	Helicopters	Aerobatic maneuvers
500 feet	Category III Aircraft	Aerobatic maneuvers and Flybys
500 feet	Gliders, Hang Gliders, powered paragliders	Aerobatic maneuvers and Flybys
500 feet	Ultra-light airplanes and Weight-shift control aircraft	Aerobatic maneuvers and Flybys
500 feet	Helicopters	Non-aerobatic maneuvers
500 feet	Category I Aircraft	Flybys
500 feet	Category II Aircraft	Flybys
500 feet	BD-5J Microjet	Aerobatic maneuvers
100 feet	Powered Parachute Aircraft, Ultralights (paragliders and powered paragliders)	Non-aerobatic maneuvers

The minimum distances in this table are based upon the following criteria:

- a) For reciprocating engine powered airplanes—true airspeed in straight and level flight at 75 percent power at standard temperature and pressure (15°C/sea level) and maximum certified gross weight.
- b) For turbine engine powered airplanes (does not include the BD-5J Micro jet),—85 percent of the maximum continuous powered straight and level flight true airspeed at standard temperature, pressure (15°C/sea level), and maximum certified gross weight.

Note: The speeds in paragraphs (a) and (b) above are used for determining assignment to a show line, not the maximum performing speed of the aircraft. See subparagraph 3-143A10) for Category.

B. Formation Flight Demonstrations. For formation flight demonstrations, the formation leader must adjust his or her ground track so that the critical aircraft remains the appropriate distance from the designated spectator areas.

C. Guidelines for Establishing Show Lines and/or Aerobatic Boxes.

1) Establish show lines prior to establishing the spectator area. If possible, the distance from a crowd line to the closest shoulder of an active runway should be at least 500 feet. This will allow demonstration teams to make formation takeoffs, performers to use the entire runway for ribbon cuts, etc. It is permissible to use a crowd line that is 500 feet from the centerline of the runway in use but requires Category I airplanes to make single ship centerline takeoffs and Category III airplane aerobatics to remain beyond the centerline, not allowing them to use the centerline for alignment during their performances.

2) Use prominent features such as runway shoulders or centerlines, tree lines, parked vehicles, boats for events over water or other geographical features to establish the show lines.

3) Prescribed minimums may not be altered to accommodate obstacles that are hazards to performers (antennas, windsocks, tall trees, hangars, etc.).

4) All show lines must be clearly discernable, to ensure that pilots have adequate visual references throughout their performance.

5) Show lines for events held at night must be lighted in a manner that ensures the lines are clearly visible and identifiable by the participating pilots.

6) For military demonstration teams, both the Category I and Category III show lines must be discernible at least 2 miles from show center at an altitude of 200 feet; the Category I show line should be clearly visible from the highest altitude required by the applicable team.

7) Any turbine engine powered airplane for which bona fide performance data acceptable to the FAA is not available will be required to perform on the Category I show line.

D. Category I Show Lines. The minimum distance from the spectator area to the show line for Category I aircraft is 1,500 feet or greater (Figure 3-26 and Figure 3-26A).

1) Aerobatic maneuvers for Category I airplanes remain centered on the Category I show line and parallel to the crowd line while in the flying display area. This includes single or multiple airplane maneuvers (Figure 3-26B).

2) If the only well defined show line is closer than 1,500 feet to a spectator area, and if it is not possible to move the spectator area, the distance between the Category I show line and the primary spectator area may be reduced from 1,500 feet to a minimum of 1,200 feet. This reduction is authorized solely in the interest of flight safety because a well-defined show line is essential for pilot orientation. Place all artificial show lines at 1,500 feet.

3) When there is a reduction in the distance from the show line to the primary spectator area, a similar reduction shall not be permitted for the secondary spectator area side of the show.

4) In no case shall there be less than 2,700 feet between the primary and the secondary spectator areas.

5) The reduction should be determined by first considering the secondary spectator area side of the show line.

E. Category II Show Lines. The minimum distance from the spectator area to the show line for Category II aircraft is 1,000 feet or greater. (Figure 3-26C)

1) Aerobatic maneuvers for Category II airplanes remain no closer than the Category II show line and parallel to the crowd line while in the flying display area unless the aerobatic box is large enough to contain any aerobatic maneuver. This includes single or multiple airplane maneuvers (Figure 3-26D).

2) If the only well-defined show line is closer than 1,000 feet to a spectator area, and if it is not possible to move the spectator area, the distance between the Category II show line and the primary spectator area may be reduced from 1000 feet to a minimum of 800 feet. This reduction is authorized solely in the interest of flight safety because a well-defined show line is essential for pilot orientation.

3) When there is a reduction in the distance from the show line to the primary spectator area, a similar reduction shall not be permitted for the secondary spectator area side of the show line.

4) In no case will there be less than 1,800 feet between the primary and the secondary spectator areas.

5) Determine the reduction by first considering the secondary spectator area side of the show line.

F. Category III Show Lines.

1) The Category III show line will not be closer than 500 feet from the primary or secondary spectator areas.

a) If there is less than 1,000 feet between the primary and any secondary spectator areas, the site cannot be considered for an air show waiver.

b) The width of the flying display area:

1. If there are less than 1,000 feet between the primary and any secondary spectator areas, the site cannot be considered for an air show waiver. The width of the aerobatic box must be large enough to contain the aircraft maneuvers and still ensure the safety distances for the spectators. When the flying display is only 1,000 feet between the spectator areas, a

single aircraft must fly centered on the 500 feet show line when in the display area. No lateral or turning maneuvers are performed in that area and the aircraft must fly past the spectator areas and make a non-aerobatic turn to re-enter the aerobatic display area (Figure 3-27).

2. For multi-aircraft demonstrations the flying display area must be wide enough to contain all maneuvers and/or all aircraft where no aircraft or maneuver is closer than 500 feet from a spectator area (Figure 3-27B and Figure 3-27C).

3. For single aircraft performing lateral and/or turning maneuvers the flying display area must be wide enough to contain all maneuvers where the aircraft or maneuver is closer than 500 feet from a spectator area (Figure 3-27A).

2) The 500-foot show line may also be used for flybys. In this case, clearly delineate the Category III show line for high performance aircraft.

3) For flybys and ingress/egress routes place corner markers on the ground to clearly identify the 500-foot lateral separation from the primary spectator area and that marker must be visible from 500 feet above ground level (AGL) at 200 knots (Figure 3-29).

G. Takeoff and Landing Distances from Spectators.

1) As listed in Table 3-2, an aircraft's performance characteristics will determine the minimum distance required between the spectator area and the takeoff/landing surface. The guidance pertaining to aircraft operations applies to all aircraft operating at an aviation event while the waiver is in effect. These same safety distances are recommended to be applied starting when spectators are allowed into the show site until all spectators have left the show site.

Table 3-2, Minimum Distance between Spectator Areas, Built-up Areas or Occupied Buildings and Take-off/Landing Surface

Minimum Distance between Spectator Areas, Built-up areas or Occupied Buildings and Take-off/Landing Surface	Aircraft Performance Characteristics
100 feet	Powered Parachute Aircraft
200 feet	(1) Airplanes, gyroplanes, and weight-shift control aircraft with reference speed for final approach (V_{ref}) of 60 kts or less and a certificated gross weight of 2500 lbs or less, including ultralights (airplanes, gyroplanes, and weight-shift control) (See Figure 3-25)
200 feet	(2) Gliders, powered and unpowered paragliders, and hang gliders (See Figure 3-25)
200 feet	(3) Helicopters—engine start and shutdown and hover taxi in ground effect (See Figure 3-30)
300 feet	Airplanes and gyroplanes with V_{ref} of more than 60 kts but less than 100 kts and certificated gross weight of 50,000 lbs or less (See Figure 3-25A)
500 feet	(1) Airplanes and gyroplanes with V_{ref} in excess of 100 kts (See Figure 3-25B)
500 feet	(2) Airplanes and gyroplanes with a certificated gross weight in excess of 50,000 lbs (See Figure 3-25B)
500 feet	(3) Airplanes and helicopter conducting excessive, non-aerobatic maneuvers on takeoff or landing (comedy acts) (See Figure 3-25B)
500 feet	(4) Helicopter—take-off and landing (See Figure 3-30)
<p>The minimum distances in this table for:</p> <p>a) Formation takeoff/landing operations, will be measured to the closest runway edge, and</p> <p>b) Single aircraft operations conducted on the centerline may be measured to the runway centerline.</p>	

2) Takeoffs and Landings—Aerobic Maneuvers Conducted. When the takeoff runway is separated from the primary or secondary spectator areas by less than 500 feet for Category III, 1,000 feet for Category II, and 1,500 feet for Category I aircraft:

a) Aerobatics are not permitted over spectator areas or congested areas; or

b) An aerobic maneuver may be performed after takeoff when the aircraft has turned away from the spectator area and crossed the appropriate show line. (See Figure 3-28 and Figure 3-28A for Category III aircraft example.)

3) Helicopter Operations. As listed in Table 3-2, all helicopters must take off and land at a minimum distance of 500 feet from the spectator area during an aviation event and helicopters will not pass over spectator areas at any time, except as provided in subparagraphs 3-147H and I below, during the departure and arrival. Helicopters must start up and shut down at a minimum distance of 200 feet from the crowd and hover taxi in ground effect or ground taxi at a maximum ground speed of 20 knots ground speed between the takeoff/landing areas and the startup/shutdown area.

4) Aircraft Towing. Conduct glider, hang glider, and paraglider towing (airplane/automobile) at a minimum distance of 200 feet from the crowd.

H. Flight over Primary Spectator Area.

1) Civilian and Military Aircraft. Flight over the primary spectator area is permitted when at or above 1,000 feet above the spectators.

2) Military Jet Demonstration Teams. When authorized by AFS-800, military demonstration teams are permitted to fly at a minimum altitude of 500 feet over the primary spectator area if:

a) Flight is non-maneuvering and straight and level or wings level in a normal climb; and

b) The direction of flight is in one direction only—back to front or front to back.

I. Flight Over Secondary Spectator Areas. The responsible person will make every effort to discourage secondary spectator areas. Secondary spectator areas cannot be under the aerobic maneuver area. Flight over the secondary spectator area is permitted by all civilian and military air show performers when the following conditions are met:

1) Minimum altitude must be no lower than 500 feet above the spectators; and,

2) Until the aircraft reaches an altitude of 500 feet, flight will be non-maneuvering and wings level in a normal climb.

J. Flyby. A flyby can be performed by a single aircraft, by aircraft in formation, or by aircraft in trail.

1) No abrupt maneuvers between the corner markers may be performed along the 500 foot show line by Category I or II airplanes,

2) Conduct a flyby along show lines at a minimum horizontal distance of not less than 500 feet from primary spectator areas, secondary spectator areas, congested areas, or occupied buildings; and in accordance with the following conditions:

a) By Category I or II airplanes—no lower than 100 feet AGL when less than 1,000 feet from a designated spectator area, unless the pilot possesses a current surface level SAC card for the make and model of airplane being flown;

b) By all airplanes—using a bank angle of no more than 75 degrees, a pitch angle of no more than 60 degrees, and a maximum indicated airspeed of no more than 300 knots, regardless of the show line category;

c) By formation flights, no lower than 200 feet AGL, using a bank angle of no more than 60 degrees, a pitch angle of no more than 45 degrees and a maximum indicated airspeed of no more than 250 knots, regardless of the show line category.

3) Corner markers must be highly visible landmarks or contrasting markers easily visible from 200 feet AGL at 200 KIAS that identify the crowd line 500-foot lateral separation (corner) points left and right of the primary spectator area (see Figure 3-29).

NOTE: Per § 91.117(d), if the minimum safe airspeed for any particular operation is greater than the maximum speed required by § 91.117(a-c), the aircraft may be operated at that speed.

K. Air Show Maneuvers Toward Primary Spectator Area. The categories for air show maneuvers towards the primary spectator area are as follows:

- Unacceptable level of risk - prohibited.
- Acceptable level of risk - no approval required.
- Acceptable level of risk - approval required.

1) Prohibited Maneuvers. Aerobatic maneuvers conducted inside the aerobatic box that in the event of a catastrophic failure a part of the aircraft would contact the surface at or inside the primary spectator area between the corner markers are prohibited.

2) Permitted Maneuvers - No Approval Required. The following maneuvers are permitted without any additional approval:

a) Aerobatic maneuvers in which the aircraft, but not the actual energy vector, is momentarily pointed towards the primary spectator area (e.g., hammerhead turns, spins, tail slides, torque rolls, and lomcevak).

b) High energy maneuvers such as minimum radius turns (maximum of 90 degrees of bank) by single aircraft on the appropriate show line for the aircraft category in accordance with the following (see Figure 3-30A):

1. Category III aircraft - maximum altitude of 250 feet;
2. Category II aircraft - maximum altitude of 300 feet; and,
3. Category I aircraft - maximum altitude of 500 feet.

c) Non-aerobatic maneuvers by a single aircraft with an energy vector directed towards the primary spectator area provided the aircraft remains beyond the appropriate reference line for their show line category (i.e., 500 feet for Category III; 1,000 feet for Category II, 1,500 for Category I) (see Figure 3-28B).

d) Flight over the spectator areas in accordance with subparagraphs 3-147H and 3-147I.

e) Repositioning turns in accordance with subparagraph 3-147L.

3) Permitted Maneuver - Approval Required. The following maneuvers are prohibited unless approved in accordance with paragraph 3-149, FAA AFS-800 Maneuver Packages Approval Process:

a) Aerobatic maneuvers which direct an energy vector toward the primary spectator at any point, other than those described in subparagraph 3-147L1), which are prohibited; and

b) Non-aerobatic maneuvers by multiple aircraft or aircraft in formation with an energy vector directed towards the primary spectator area.

c) Aerobatic 360 degree turns with an energy vector directed towards the primary spectator area:

1. For single aircraft that exceed the requirements of paragraph 2)b) above;

or

2. For multiple aircraft.

L. Repositioning Turns.

1) Return to the Flying Display Area/Aerobatic Box. Conduct repositioning turns that may have an energy vector directed towards the primary spectator area made for the purposes of returning to the flying display area or aerobatic box to realign with the appropriate category aircraft show line as follows:

- a) Civilian performers.

1. Holders of a statement of aerobatic competency card and flying Category III or Category I and Category II ex-military fighters are permitted to perform repositioning turns using a maximum of 120 degrees of bank and 90 degrees of pitch when above 500 feet AGL and not over designated spectator areas or congested areas.

2. Holders of an endorsement for pitch and bank angles up to 90 degrees are permitted to perform repositioning turns to those limits above 500 feet AGL when not over designated spectator areas or congested areas.

b) Military jet demonstration teams and single ship demonstration teams.

1. Military demonstration teams with accepted maneuvers packages are permitted to exceed a maximum of 120 degrees of bank and 90 degrees of pitch; and

2. Pitch and bank angles must not exceed standard operating procedures prescribed for the specific aircraft; and

3. Inverted flight is not authorized below 1,500 feet AGL and not over congested areas or spectator areas.

2) Inside the Flying Display Area/Aerobatic Box. When it is not practical to leave the flying display area or aerobatic box in between segments of a flight demonstration, repositioning turns that have an energy vector directed towards the primary spectator area and are made for the sole purpose of remaining in the flying display area and realigning with the appropriate Category show line are permitted in accordance with the following:

a) Holders of a statement of aerobatic competency card or an endorsement for pitch and bank angles up to 90 degrees are permitted to perform repositioning turns and/ or clearing turns to a maximum 90 degree bank;

b) The turns are carried out without abrupt control inputs during the portion of the turn when the aircraft is directing energy at the crowd; and

c) The turns are conducted in a manner to ensure the aircraft remains beyond the appropriate distance for their show line category (i.e., 500 feet for Category III; 1,000 feet for Category II, 1,500 feet for Category I).

M. Night, Civil Twilight and Airborne Pyrotechnic Demonstrations Authorization.

Aerobatic performers may request authorization to conduct aerial demonstrations at night (after civil twilight). The demonstrations are typically conducted with pyrotechnic devices attached to the wings. Other demonstrations use numerous landing lights, strobe lights, or smoke. Conduct these demonstrations no lower than 500 feet and no higher than 5,000 feet AGL. Jet aircraft performers may request a higher ceiling requirement. Inspectors can accommodate such requests by ensuring that the following have been accomplished:

- The pyrotechnic or light installations are appropriately documented in the aircraft's maintenance records.

- The requirements in subparagraph 3-147N below are met.

N. Night and Twilight Event Special Provisions. As appropriate, include the applicable special **PROVISIONS IN ADDITION TO THE SPECIAL PROVISIONS IN PARAGRAPH 3-155 OF THIS** section for events conducted after local sunset.

1) Confine aerobatic demonstrations at night to 1 NM on either side of the show center along a well-defined, lighted show line.

2) Confine aerobatic demonstrations to altitudes above 500 feet AGL and below 5,000 feet AGL after official sunset.

3) The minimum weather conditions at night require a cloud base no lower than 2,500 feet and 3 statute miles visibility. Section 91.155 will not be waived for any flight conducted between sunset and sunrise.

4) Aircraft position lights must be operating from sunset to sunrise except while pyrotechnics on the aircraft are illuminated unless § 91.209 is waived. Waive § 91.209 only if the flight is conducted totally within Class B, C, D or TFR airspace.

5) When pyrotechnics are illuminated, operations over persons are prohibited at any altitude.

O. Passenger and Emergency Helicopter Operations. During some aviation events, helicopters take passengers for rides or serve as emergency vehicles. The responsible person, in conjunction with the helicopter operator, will establish a comprehensive operation plan, to include egress and ingress routes that do not over-fly spectator areas at low altitudes and will not interfere with performers or other operations conducted during the event. This plan will be briefed at the performers' briefing. The following guidelines will be adhered to:

1) Startup and shutdown areas for helicopters will be:

a) Located at a minimum distance of 200 feet from the crowd or passenger waiting areas.

b) Protected by appropriate barriers and/or crowd control to prevent unauthorized persons from entering these areas.

c) Located to prevent the helicopter from passing over spectators during takeoff or landing.

2) Pilots must receive the performer's briefings by the same briefer unless relief is granted by the IIC for a different briefer to give the briefing due to remoteness of helicopter operations in reference to the event (attendance at the performer's briefing is highly recommended).

3) Refueling procedures for operations conducted during the event hours must be approved by the IIC.

NOTE: Helicopter operations will not be permitted during military demonstration team performances, or parachuting operations. The IIC may permit helicopter operations during parachuting operations if the operations are distant enough from the parachuting landing area to not be a safety hazard (e.g., Air Venture at Oshkosh, where the helicopter operations are at a separate location from the main airfield).

P. Helicopter Demonstrations.

1) Helicopter Acts Involving External Load Operations. Air show acts that are considered Class B, C, or D external-load operations, will not be conducted over persons on the surface unless those persons are part of the act and must be conducted in accordance with 14 CFR part 133 and the provisions of the waiver. Military helicopters need not comply with part 133 but must comply with the provisions of the waiver.

2) Helicopters may perform aerobatic maneuvers no closer than 1,000 feet horizontally from designated spectator areas.

3) Helicopters performing aerobatic maneuvers must have a valid and current special airworthiness or experimental certificate issued in the Experimental Category for the purpose of exhibition. Nothing contained in these special provisions of the waiver should be contrary to any operating or special limitation issued as a part of that special airworthiness or experimental certificate.

4) Helicopters may not perform non-aerobatic abrupt maneuvers closer than 500 feet horizontally from a spectator area.

5) Helicopter performers are limited to the aerobatic maneuvers as listed on their statement of aerobatic competency card.

Q. Air Carrier Aircraft Demonstrations. Flight demonstrations may be conducted at an air show under the provisions of a waiver by any certificated air carrier with a large (more than 12,500 lb gross takeoff weight (GTOW)) aircraft listed on that certificate. When an air carrier operating this large aircraft requests authorization to conduct a flight demonstration at an air show, the IIC will require the following:

1) The air carrier will develop a performance package that describes in detail the entire flight profile. The performance package will specifically address the make and model of the aircraft and take into consideration any specific flight safety conditions of that aircraft.

2) A waiver provision should be developed with the following limitations:

- Minimum altitude—200 feet AGL,
- Maximum bank—30 degrees,
- Maximum speed—300 knots, and
- Minimum speed— V_{ref} for the configuration and weight of the aircraft, or as required for the go-around sequence on touch-and-go landings should be

permitted only when the carrier has addressed the crew procedures, the runway requirements, and the abort procedure in sufficient detail.

3) Coordination with the air carrier's principal operations inspector (POI) is necessary before approval by the IIC.

4) Any maneuvers not in the air carrier's training program must be practiced before the demonstration. This practice may be in an approved simulator that represents the make and model of the demonstrated aircraft.

R. Ultralight Vehicle Demonstrations. An ultralight vehicle is only a single place vehicle and must meet the applicability of 14 CFR part 103, § 103.1 and operate as an ultralight vehicle under part 103. The FAA does not require certification of ultralight vehicle operators meeting the provisions of § 103.1.

1) Aerobatic flight demonstrations by ultralight vehicles should be included on a certificate of waiver or authorization, with appropriate special provisions. The applicant must provide the issuing office with a statement of determination that the vehicle meets the requirements of § 103.1 or authorized under an exemption to part 103, and the operator is able to conduct the proposed demonstration without creating a hazard to persons and property on the surface. The statement should contain a summary of how the determination was made. The IIC determines if the statement is suitable. The IIC may require a demonstration prior to making a determination. For additional support, contact AFS-800.

2) Ultralight vehicles must meet the same separation standards as conventional aircraft with a level flight cruise speed of less than 156 knots using 75 percent power (Category III), with the exception of powered parachutes.

3) Wing walking acts using ultralight vehicles are not authorized for operation as an ultralight vehicle operated in accordance with part 103. Only certificated aircraft may be used for this type operation.

4) Pilots may not receive compensation for participation at aviation events because ultralight vehicles may not be operated for compensation or hire.

S. Experimental Amateur-Built and Exhibition Aircraft. The aircraft can be flown acrobatically if it is airworthy and not prohibited from aerobatic flight. The performer must provide to the IIC documentation of the aerobatic maneuvers authorized in accordance with the aircraft operating limitations. The IIC should consult with the airworthiness inspector regarding suitability.

T. Wing Walking and Specialty/Trapeze Acts. Wing walking acts may be approved when the performers have safely demonstrated the act in an aerobatic competency evaluation. Section 91.107(a)(2) and (3) may need to be waived for stunt persons only. All helicopter trapeze acts must comply with the applicable requirements of part 133 concerning helicopter external load combination Class B or D operations. Avoid over-flight of the designated spectator areas for these acts.

U. Ground-Based Pyrotechnics. As appropriate, in addition to the applicable air show special provisions listed on the FAA Internet site at <http://www.faa.gov/about/initiatives/airshow/waiver/> and on the FAA employee's Intranet site at <https://intranet.faa.gov/faaemployees/org/linebusiness/avs/offices/afs/programs/airshows/tora/index.cfm>, include the pyrotechnics special provisions and checklist (see Figure 3-39) for events that will use ground-based pyrotechnics, if the ground-based pyrotechnics will be installed and/or detonated anywhere on the airport surface.

V. Glider Operations. The following criteria apply only to glider operations.

- 1) Motorized and non-motorized gliders fall into the Category III aircraft group. Category III aerobatic box and performance distances apply.
- 2) Unless obstructions are present that would make a taxiway takeoff unsafe, it should be permitted with a minimum distance of 200 feet from the primary spectator area (see Figure 3-25). This distance may be reduced to 150 feet if the takeoff path is at an angle of at least 10 degrees away from the spectators.
- 3) Landings may be approved on the taxiway used for the takeoff as long as there are no obstructions or adverse wind conditions that would create a hazard to the spectators. If the landing approach requires a low altitude turn over the spectators, landing on a taxiway is not permitted. After landing, the aircraft must come to a full stop at least 50 feet from spectators.

W. Agricultural Aircraft Demonstration. In addition to the applicable air show special provisions listed on the above mentioned Web sites, include the appropriate agricultural aircraft special provisions for events that have agricultural aircraft aerobatic demonstrations.

X. Ingress and Egress Routes Into and Out of the Flying Display Area.

- 1) All Civil and Military Aircraft. For flight over congested (built-up) areas adjacent to flying display areas:
 - a) Section 91.119(a) will not be waived for aerial demonstration purposes. Section 91.119(a) requires that all pilots must always operate an aircraft at an altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface, except when necessary for takeoff or landing; and
 - b) Aerobatic maneuvers are prohibited.
- 2) All Civil and Military Aircraft (Except for Sanctioned Military Demonstration Teams). For flight over congested (built-up) areas adjacent to the flying display area:
 - a) Minimum Altitude. At least 1,000 feet above the highest obstacle within a radius of 500 feet from the aircraft;
 - b) Ingress from Adjacent Congested Areas (Built-up Areas) to Flying Display Area. Aircraft entering a flying display area from over a congested (built-up) area are permitted to leave the minimum altitude specified above in subparagraph 3-147X2a) to complete a smooth

transition to the performance altitude on the flight line; however, the angle of descent should not be lower than a normal approach for that aircraft type (i.e., steeper than normal approaches are permitted).

c) Egress from Flying Display Areas to Adjacent Congested (Built-up) Areas. Aircraft exiting a flying display area to a congested (built-up) area should climb at a rate consistent with the safe operation or best pitch attitude for that aircraft type. If extended flight over the built-up area is expected, compliance with the minimum altitude specified above in subparagraph 3-147X2)a) is required (see Figure 3-31).

Y. Compensation at Air Shows.

1) To receive any type of compensation (fuel, oil, lodging, rental cars, etc.), for flight activities at an air show, an airman must have a commercial pilot certificate and second-class medical certificate. The aircraft must be certificated for operations that allow compensation or hire. Additionally, if passengers or property are carried for compensation or hire, the aircraft must be certificated to allow for those types of operations.

2) In accordance with part 91, § 91.319, all experimental aircraft are prohibited from conducting operations for compensation or hire while carrying passengers and/or property operations. Experimental aircraft may be authorized to be operated for compensation or hire without any passengers or property on board.

3) IICs should conduct an investigation when they become aware of any performers who may only hold a private pilot certificate and appear to be receiving compensation while performing or giving rides.

4) Additionally, all FAA inspectors conducting surveillance should be vigilant in monitoring activities that involve passenger rides at an aviation event. They should conduct an investigation when they become aware of operations conducted in an aircraft or by a pilot who may be operating contrary to regulations.

3-148 MILITARY PERFORMANCES.

A. General. The guidelines in this paragraph apply to military aircraft, military pilots, and parachute teams specifically designated to perform missions for the U.S. DOD and the Canadian DND.

1) Only the Aviation Liaison Officer in the Office of the Assistant Secretary of Defense for Public Affairs can sanction a U.S. DOD team

2) Canadian DND Sanctioned Military Teams. The Canadian DND-sanctioned military teams are the Canadian Forces Snowbirds, the Canadian Forces CF-18 Demo Special Events, and Sky Hawks. Their contact information is listed on <http://www.faa.gov/about/initiatives/airshow/military/>.

3) The DOD-sanctioned single ship military demonstration teams are not exempt from any regulation or policy that is used in issuing a waiver unless specifically stated in their

FAA-accepted command guidance. Fly these aircraft in accordance with these guidance documents (see paragraph 3-148C below).

4) FAA headquarters does not issue any blanket special approvals, authorizations, waivers, or blanket exemptions that would pertain to all military air show performances. The sanctioned North American Jet Demonstration teams have maneuver packages that are approved each year and pertain only to the team for whom it was approved.

5) Forward any outside complaints received by the FAA as a result of the aerial demonstration to the designated military representative for disposition. Direct any questions by FAA representatives involving a military team to the appropriate team.

6) Enforcement action against any military team or performer will be conducted according to current FAA policy (see the current edition of FAA Order 2150.3, Compliance and Enforcement Program). When enforcement action is initiated, the IIC must notify the national air show coordinator through the regional air show coordinator.

7) All accidents and incidents must be reported to the national air show coordinator by the IIC through the regional air show coordinator.

B. Sanctioned Military Jet Demonstration Teams. This title pertains only to The Blue Angels, The Thunderbirds and the Snowbirds. A list containing their contact information is available at <http://www.faa.gov/about/initiatives/airshow/military/>.

1) The sanctioned military jet demonstration teams provide AFS-800 with command-approved maneuvers packages for approval. See paragraph 3-149 for the approval/acceptance process.

2) These teams normally will conduct preseason meetings with the air show event organizer and jurisdictional FAA offices. These meetings will usually occur in the winter months before the start of the air show season. Participation in these meetings is mandatory for the jurisdictional FSDO. It is incumbent upon the event organizer to notify the appropriate FSDO in ample time to send a representative to the meeting. The FSDO will notify the regional air show coordinator of the meeting. It is imperative to review site suitability in detail with the event organizer and military jet demonstration team representative at this meeting. This will include, but is not limited to, the placement of the aerobatic box and impact on the nonparticipating public on the surface under this box, review of proposed ingress/egress routes that will require FAA approval and any impact on scheduled air carrier operations.

3) Coordinate any change to an FAA maneuvers package or the addition or removal of a pilot authorized to fly under the prescribed maneuvers package with the national air show coordinator as soon as possible. These changes are not authorized until accepted or approved by AFS-800 and the national air show coordinator.

4) Military jet demonstration teams and military Single ship Demonstration teams may conduct an arrival demonstration. This normally consists of several passes for visual familiarity with existing landmarks and maneuvers practice using these landmarks. Coordinate

details of the arrival demonstration in advance. For the military demonstration teams, this should be accomplished at the preseason meeting.

a) The arrival demonstration must be previously approved and meet all FAA regulations and requirements as stated in the waiver and special provisions. The main difference between the arrival demonstration and a regular demonstration is that the normal size crowd is not present, which may preclude the need for crowd control.

b) The teams often ask to have the team advance coordinator or operations officer accept the arrival demonstration briefing and relay all necessary information to the team. The IIC should allow this if the team representative is a rated aviator or a non-rated officer serving with the team. Briefings with the team representative must be completed before the team's arrival at the demonstration site. It is mandatory that the IIC or IIC's representative is present at this briefing.

5) The sanctioned military jet demonstration teams have FAA-approved maneuvers packages. The maneuvers packages describe each demonstration maneuver in detail and specify ingress/egress routes. Flight over congested (built up) areas adjacent to flying display areas (ingress and egress) must be carried out as follows:

a) They are authorized to fly non-aerobatic at 500 feet above obstacles and/or occupied buildings when within 3 NM of show center.

b) The opposing solos are permitted to descend below 500 feet AGL in the transition area over occupied buildings in a wings level shallow descent to arrive at 200 feet AGL before reaching 1 NM from show center.

c) On a case-by-case basis, where it is deemed a safe transition to the next maneuver, the IIC will grant a waiver to the sanctioned military jet demonstration teams permitting them to fly as low as 200 feet above the highest obstacle within a 500-foot horizontal radius along specified ingress/egress routes within 3 NM from show center, provided the following conditions are met:

1. A request is sent or given to the IIC by an authorized team member for each show site.

2. The results of a completed onsite survey conducted during the current air show season by a representative of the military demonstration team.

3. A current aerial photograph or topographical chart depicting the Category I show line, aerobatic box required for the approved maneuvers package, and ingress/egress routes.

4. Depict ingress/egress routes on a 1:24,000 scale map (or its equivalent) indicating the minimum altitudes requested, the 500-foot lateral distance of the end of the primary spectator area, and any other secondary open-air assemblies of persons.

d) Flight is never authorized below 500 feet:

1. Over occupied buildings outside of the transition area;
2. Within 500 feet laterally of open-air assemblies of persons; and
3. Aerobatic flight is not permitted outside of the aerobatic box (except as authorized as stated above).

C. Sanctioned Military Single Ship Demonstration Teams—Military Single-Ship Demonstrations. The military single ship demonstration teams are the sanctioned North American military specialized teams that demonstrate the capabilities of one particular aircraft; (e.g., the USAF A-10, F-15, F-16, and F-22 single ship demonstration teams); the USN F-18 single ship demonstration teams; and Canada's DND single ship demonstration teams. The applicable branch of the military must develop guidance and/or maneuver packages, which define the aerobatic routine to be performed at aviation events (see paragraph 3-149).

D. Other U.S. Military Demonstration Teams. Other U.S. military demonstration teams include the USAF Heritage Flights and the U.S. Navy Tailhook Legacy Flights. These flights may include a victory roll at the end of their performance and is the only aerobatic maneuver authorized but is not authorized over spectator areas or occupied buildings and must conform to military guidance or meet civilian requirements as appropriate. Various other military aircraft may be authorized for flybys, simulated in-flight refueling demonstration, simulated assault or rescue operation or other non-aerobatic operations or static displays.

E. Other Foreign Military Demonstration Teams. Other foreign military flight demonstration teams single and multi-aircraft, must submit a maneuvers package to AFS-800 to ensure compliance with FAA guidance. See paragraph 3-149 for the approval process.

F. Military Parachuting Demonstration Teams.

1) Sanctioned Military Parachuting Teams. The sanctioned military demonstration teams are the U.S. Army Golden Knights, U.S. Navy Leap Frogs and the Canadian DND Skyhawks. The sanctioned military parachute teams are considered to have met the highest level of parachuting certification. The team members need not be listed on an application for a FAA Parachuting Authorization application, FAA Form 7711-2. The sponsor or responsible person may make the application for a sanctioned team.

2) Non-Sanctioned Military Parachuting Teams. Non-sanctioned military teams are not performing any demonstrations for the DOD or DND, therefore must meet all the same requirements as any civilian team.

G. DD Form 2535—Military Participation. The DOD requires the event organizer, or a designated representative, to complete DD Form 2535, Request for Military Aerial Support, when requesting a U.S. military aerial demonstration team on or off a military installation. The event organizer or representative must forward the form to the appropriate FSDO. The event organizer must allow for a 30-day review period. The FSDO completes Section IV, FAA Coordination (Airspace Coordination). Classify the proposed site requiring a waiver as satisfactory, conditional-satisfactory, or unsatisfactory during an FAA inspector conducted site

feasibility study. The USAF is using an automated DD Form 2535 and the applicant can only obtain it by accessing their Web site: <http://www.acc.af.mil/aerialevents/>.

- A satisfactory classification indicates that a waiver is not required or can be issued following compliance with other stated requirements.
- A conditional-satisfactory classification will include specific conditions that need to be met, such as closing roads, evacuating buildings, etc., and special consideration for the military demonstration teams' ingress and egress routes.
- An unsatisfactory classification indicates that the requested activity cannot be performed safely at the proposed site, and a waiver will not be issued.

1) Generally, the standard aerobatic box for the Blue Angels and Thunderbirds is 12,000 feet by 3,000 feet. The Snowbirds usually request 8,000 feet by 3,000 feet. For a single ship demonstration team, the standard aerobatic box is 6,000 feet by 3,000 feet. The support manuals and some maneuvers packages will indicate the size of the required airspace.

2) Military Flybys (Other than an Aviation Event). DD Form 2535, "Request for Military Aerial Support," for a flyover or flyby at civic events, funerals, etc., are submitted to the local FSDO for FAA coordination. Other than the three sanctioned North American Jet Demonstration teams, the flybys should be accomplished at 1,000 feet above the highest obstacle within 2,000 feet horizontal from the flight path.

a) If no regulations are being waived:

1. No site evaluation is necessary.
2. Contact the AT facility with jurisdiction for the air space being used for coordination and enter the AT contact information in block 18 of Section IV.
3. Check the appropriate boxes (a through g) in block 16.
4. Check the appropriate box in block 17. If other than satisfactory, enter the conditions for "Conditionally Satisfactory" or reason(s) for "Unsatisfactory" in block 18.

b) If a waiver of one or both of the following regulations is required:

1. If the speed requested is above those authorized in § 91.117
2. If one of the sanctioned military jet demonstration teams is requesting a flyover below 1,000 feet above the highest obstacle 2,000 feet either side of their flight path as required in § 91.119.
3. If a waiver of § 91.119 is issued to one of the sanctioned military jet teams, the following conditions must be met:
 - a. A site suitability must be conducted including ingress and egress routes,

b. Flight below 500 feet above the highest obstacle 1,000 feet either side of the intended flight path is not authorized, and

c. Only shallow turns, climbs and descents are authorized below 1,0000 feet AGL.

4. In addition the following coordination requirements must be met:

a. Conduct a briefing between the PIC and ASI before the flyby.

b. Compliance with all other rules of part 91 is required.

3-149 FAA AFS-800 Maneuvers Packages Approval Process.

A. North American and Foreign Military Flight Demonstration Teams. North American and Foreign Military flight demonstration teams, single-ship demonstration teams, and mixed military and civilian formation demonstrations who conduct public performances in the United States require FAA acceptance of their command-approved maneuvers package or accepted aerial demonstration guidance by AFS-800. Some of the maneuvers described in these packages may not conform to all guidance requirements in Volume 3, Chapter 6 (e.g., airspeed, altitude over primary spectator area, etc.) and therefore require FAA acceptance of their maneuvers package (see paragraph 3-148 above).

B. Civilian Performers. Civilian performers requesting approval for one or more maneuvers described in subparagraph 3-147K) or relief from one or more requirements listed in this chapter require FAA acceptance and must make an application as follows:

1) The applicant must fill out an applicant to include (applicants that are applying for relief from a requirement and not an approval of a maneuver need only comply with a and b below and send request to address listed in subparagraph 3) below):

a) A copy of the performers statement of aerobatic competency (FAA Form 8710-7 or Transport Canada Form 27-0307);

b) A detailed description of the maneuver(s) requiring approval or relief;

c) A pictorial display (e.g., ribbon drawing) of the maneuver(s) including the sequence in which the maneuver(s) will be flown;

d) The entry and exit airspeed and altitude for the requested maneuver;

e) The airspace required to complete the maneuver(s) requiring approval to include lateral, horizontal and vertical distances;

f) A computation of turn radius, scatter radius and safety radius from the closest points to the primary spectator area of the maneuver(s) needing approval using the formulas listed in subparagraph 3-151 noting the airspeed, altitude and G forces used in the computations; and

g) An evaluation from an ICAS or EAA aerobatic competency evaluator verifying the following.

1. The maneuver has been demonstrated,
2. It can be performed competently with regularity,
3. It has been demonstrated by the applicant to be within the airspace described in 4 above, and
4. It does not meet the definition of a Prohibited Maneuver as described in subparagraph 3-147K1).

2) Upon completion, the aerobatic competency examiner will forward the application and evaluation results to: ICAS Safety Committee Chairman, 750 Miller Drive, S.E., Suite F-4 F-3, Leesburg, Virginia 20175.

3) Upon receipt, the Safety Committee will review the application and documentation. Within 15 working days of receipt, the Safety Committee Chairman will forward the application package with comments to: FAA Headquarters, AFS-800, 800 Independence Avenue, SW, Washington, D.C. 20591.

4) AFS-800 will notify the applicant of the results within 30 days of receiving the application package from the ICAS Safety Committee Chairman.

C. Evaluation Process. An evaluation is required to assure an equivalent level of safety for spectators in case of an incident involving the aircraft. AFS-800 and the National Air Show Coordinator will decide what the appropriate evaluation requires. This will depend on the requested maneuver(s) and completeness of the application. The review may include but not limited to a safety committee of subject matter experts as determined by AFS-800.

1) The following criteria will be used to evaluate maneuvers for compliance:

a) Aerobatic maneuvers which direct an energy vector toward the primary spectator at any point, other than those described in subparagraph 3-147K1), which are prohibited.

b) Non-aerobatic maneuvers by multiple aircraft or aircraft in formation with an energy vector directed towards the primary spectator area.

c) 360 degree turns with an energy vector directed towards the primary spectator area:

1. For single aircraft that exceed the requirements of subparagraph 3-147K(2)(b) above; or

2. For multiple aircraft.

2) Below is an outline of the FAA acceptance process:

a) Military Flight Demonstration Individual Pilots or Teams planning to perform an aerobatic demonstration in the United States must submit an application package that contains the following requirements:

1. A complete copy of their maneuvers package must be furnished to AFS-800, National Air Show Coordinator, and;

2. The maneuvers package (electronic format is required) will consist of profiles that must contain the following:

A ribbon pictorial (or equivalent) of all maneuvers in the performance,
Minimum and maximum operating altitudes,
Distances from the designated spectator area, and
Relationship of the aircraft to the show line.

3. Minimum weather requirements for the performance and profiles for a high and low show if that option is available.

4. The size and dimensions of the following airspace required to conduct the performance: flying display area, aerobatic box, and ingress/egress routes.

5. A proposed date for a private demonstration/review by the National Air Show Coordinator.

b) Military teams must also submit a letter from the commanding officer authorizing this military team. The letter must include:

- A team roster, including the address and telephone number of the commanding officer of the military organization;
- The military orders describing the requirements for training and the conduct of the operation; and
- A list of the aircraft used in the demonstration and a description on how to conduct flight demonstrations in the United States.

c) For all civilian teams or individuals requesting a maneuvers package approval for relief from one or more requirements in this guidance will submit a letter of request. The letter must include:

- A team roster, including the address, telephone number, fax number and e-mail address of the point of contact (POC).
- If foreign, a list of the aircraft used in the demonstration and a description of how they intend to conduct flight demonstrations in the United States.
- If requesting an approval for a maneuver not meeting the description in subparagraph 3-147K2) (acceptable maneuvers) then submit an application in accordance with subparagraph 3-149B above.

d) Final acceptance of approved maneuvers. The national air show coordinator will coordinate any necessary changes with the applicant. Changes may also be coordinated with an appropriate committee selected by AFS-800.

3-150 PARACHUTE DEMONSTRATIONS. Although many air show activities may require waivers, parachuting or skydiving demonstration jumps do not. As provided in part 105, some of these jumps require a certificate of authorization. FAA Form 7711-2 is the application for authorizations parachute jumps.

A. Parachutists Not Associated with the USPA. Parachutists who are not members of the USPA and who wish to participate in a demonstration or exhibition jump over or into a congested area, must present satisfactory evidence of the experience, knowledge, and skill equivalent to that required by the USPA. Although the majority of contacts with the parachutists are made by operations inspectors, questions concerning parachute riggers, airworthiness, or engineering should be referred to the Aircraft Maintenance Division (AFS-300) and/or the Aircraft Certification Service, Rotorcraft Directorate's Special Certification Office (ASW-190) for resolution. In some cases, the local USPA area safety and training advisor may be able to answer safety questions regarding the jump and landing area. Contact the USPA for assistance in locating a USPA area safety and training advisor in your area.

1) If the applicant is unable to provide adequate information about the event or jumper's qualifications, inspectors may require a demonstration jump (not over a congested area) before approving an authorization.

2) The FAA authorized the USPA to adopt its own safety rules and licensing standards for parachutists, instructors, and jumpmasters. Additionally, the USPA has pledged to implement a policy of self-policing so that conflicts with other airspace users are avoided and a high level of safety is maintained. Toward this goal of assisting the FAA, the USPA has supplied every FSDO with a brochure of its rules and safety programs and has offered assistance any time the FAA has encountered problems with a particular club or has questions regarding parachuting.

3) Airborne demonstrations, other than those performed by the DOD, must have an approval letter from AFS-800 containing the conditions for these demonstrations if the equipment, opening altitude and jump experience does not meet the requirements found in this paragraph.

B. Safety. Title 14 CFR part 105 states rules designed to protect the general public and other users of the national airspace from sport parachuting activities.

1) When a parachute jump is conducted over or into a congested area, a certificate of authorization is required.

2) An open-air assembly of persons usually occupies a relatively small area. Therefore, it should not be a problem to avoid these areas during an exit. The primary purpose of an exit limitation over an open-air assembly is to provide a higher level of safety under the remote possibility that a jumper would be unable to deploy one of two parachutes.

C. Certificate of Authorization (FAA Form 7711-1). Section 105.21 includes rules applicable to jumps over or into congested areas or open-air assemblies of persons. Any jump over or into a congested area requires FAA Form 7711-1. Section 105.15(a) (1 through 7) lists the information required when applying for a Certificate of Authorization.

1) The drift-over provision of § 105.21 permits a jumper to exit an aircraft over areas other than a congested area and, with a fully deployed parachute, drift over a congested area or open-air assembly of persons, and then land in an open area. Under these circumstances a certificate of authorization is not required. However, the drift-over provision does not permit any jump that results in a landing into a congested area or open-air assembly of persons unless the parachutists have obtained a certificate of authorization.

2) Operations inspectors reviewing applications for authorizations to jump into congested areas or controlled airspace should look for any indication that these jumps involve special stunts or more participants than the aircraft type certificate allows. When in doubt, coordinate with the FSDO airworthiness unit. Further information about congested areas can be found in Volume 3, Chapter 51, Section 6, Evaluate a Part 133 Congested Area Plan (CAP), paragraph 3-4203; and Volume 3, Chapter 52, Section 2, Evaluate a Part 137 Congested Area Operations Plan, paragraph 3-4258.

D. Parachutist's License and Recent Experience. The competence of parachutists is extremely important when evaluating the suitability of a landing site.

1) Open field and Level I landing areas require a current USPA class C or D license (or equivalent), a minimum of 200 jumps, of which 50 jumps were within the last 12 months to include 5 jumps within the previous 60 days on the same make and model canopy to be used for the demonstration.

2) Level II and stadium landing areas require a class D license with a pro rating (or equivalent), and 50 jumps within the last 12 months to include 5 jumps in the previous 60 days on the same make and model canopy.

3) USPA issues the PRO rating with an expiration date that coincides with the expiration date of the holder's USPA membership. USPA members are renewed on the basis of continued demonstration of the original certification requirements. USPA original certification requirements are memberships in USPA, a USPA class D license, and the accomplishment of 10 successive jumps into a 10-meter (33 feet) diameter target area in accordance with the following:

- Accomplish all required jumps with a stand-up landing;
- The size of the canopy used during the PRO rating qualification determines the smallest canopy allowed in demonstration jumps; and
- Either a safety and training advisor or an instructor/examiner and at least two other spectators witnesses qualification jumps.

E. Landing Areas. All FAA-authorized demonstration jumps are classified as open field, Level I, Level II, or stadium.

1) Open Field.

a) A minimum-sized area that will accommodate a landing area no less than 500,000 square feet (e.g., approximately 750 by 750 feet, or an area with the sum total that equals or exceeds 500,000 square feet);

b) Allows a jumper to drift over the spectators with sufficient altitude (250 feet) so as to not create a hazard to persons or property on the ground; and

c) Will accommodate landing no closer than 100 feet from spectators.

2) Level I Landing Area.

a) An open area that will accommodate a landing area no smaller than 250,000 square feet (e.g., approximately 500 by 500 feet); and

b) Permits jumpers to land no closer than 50 feet from the spectators and to pass over the spectators no lower than 250 feet, including the canopy and all external paraphernalia.

c) Many open field athletic areas and airport operational areas constitute Level I landing areas.

3) Level II Landing Area.

a) An open area that will accommodate a rectangular, square, oval or round shaped landing area of approximately 5,000 square feet for no more than four jumpers, with at least 50 feet in width. An additional 800 square feet minimum for each additional jumper over four for any jumper landing within 30 seconds of the last of any four jumpers; and

b) Permits jumpers to land no closer than 15 feet from the spectators and to pass over the spectators no lower than 50 feet including the canopy and all external paraphernalia.

c) Athletic fields 150 yards in length by 80 yards in width, or smaller with bleachers, walls, or buildings in excess of 50 feet in height on two or more sides above the landing surface, are defined as stadiums and constitute Level II landing areas.

4) Stadium. A Level II landing area smaller than 150 yards in length by 80 yards in width and bounded on two or more sides by bleachers, walls, or buildings in excess of 50 feet high.

5) Other Landing Area Considerations.

a) A landing area that exceeds the maximum dimensions of a Level I landing area, permits a parachutist to drift over a congested area or open air assembly with a fully deployed and properly functioning parachute (if the parachutist is at sufficient altitude to avoid

creating a hazard to persons and property on the ground), and that has no other safety concerns would likely not require a certificate of authorization as required by 14 CFR part 105, § 105.21 or § 105.25.

b) Any parachute jumping demonstration planned in conjunction with a public aviation event will require a certificate of authorization with appropriate special provisions as required by § 105.21 and/or § 105.25 even if the landing area exceeds the maximum dimensions for a Level I area. A parachute jumping demonstration planned in conjunction with a public aviation event is one that takes place any time after the first spectator arrives for the event that day.

F. Tandem Jump Demonstrations.

- 1) Tandem jumps will only be authorized in open field and Level I landing areas.
- 2) The USPA must approve the tandem jump master in order to conduct tandem jumps.
- 3) The passenger (or “rider”) requires no previous jump experience or license.

G. Alternate Landings Areas. Regardless of the parachutists’ experience, “runoffs” or escape areas must be identified.

H. Cutaway Acts. Cutaways may not be performed if cutaway equipment will drift into the spectator area.

3-151 AIR RACES.

A. Cross-country Air Races. Cross-country air races are normally proficiency type races and do not require waivers other than for altitude and speed at checkpoints along the route. This will require some coordination with the AT facility that services that airspace. See Volume 3, Chapter 7, Issue a Certificate of Waiver or Authorization: 14 CFR Part 91, Section 91.119(b) and/or (c) (Minimum Safe Altitudes), for assistance and guidance in issuing a waiver for § 91.119. Airspeed may be waived in accordance with this chapter similar to military flybys described in subparagraph 3-148G2.

B. Closed-course Air Races. Due to the complexity of the two types of closed-course pylon air racing courses (e.g., Reno type and Red Bull type), all air racing courses must be submitted to AFS-800, the national air show coordinator, for approval before a waiver can be issued by the FSDO having jurisdiction. The formulas found in subparagraphs 3-151G and H should help the applicant design the racecourse for submission.

NOTE: Both demonstration and competitive events are normally conducted over a fixed, short-distance racecourse, usually located on or adjacent to an airport. It is the sponsor’s responsibility to design the course so that hazards to spectators and other persons on the surface are prevented. Only persons and vehicles authorized by the participating race organization will be permitted beyond the crowd line during racing operations.

- 1) Authorized persons may include press, aircraft support crews, judges, and officials at the start line.
- 2) Authorized persons must clear the runway and move back to at least the runway “hold short” line 1 minute before the launch for standing starts. No one will be permitted in front of the first row of aircraft after this time except the starter flag team.
- 3) Pylon crews, press, and vehicles, except the home pylon flag crews, will remain inside the pylon course during races in designated areas. Race timing teams are permitted in the area between the crowd line and the show line during racing.
- 4) Handle non-competitive demonstration races like a competitive event, including a determination of pilot competency. Choreograph demonstration races from takeoff to landing. New classes of racing aircraft must be found competent by a similar existing air racing organization.

C. Participants. A fundamental principle of closed-course air race safety, including demonstraTion events, is that all of the participants need to be associated with an organization dedicated to the sport. Race pilots must possess a current race pilot authorization in the class in which that pilot is racing (issued within the previous 12 months). An organization or person given issuing authority by the FAA must issue the race pilot authorization. The structure and existence of a credible air racing organization provides an internal level of safety that would not otherwise exist. It is recommended that the IIC determine the following before issuing a waiver for an event that includes closed-course air races:

- 1) Determine whether the air race course has AFS-800 approval.
- 2) Determine if the participants have the proper qualifications by holding air race pilot authorization for the class in which they are participating.
- 3) Obtain statements from the organization regarding the air racing currency of each airman.
- 4) Determine whether the organization has established safety operating rules.
- 5) Inform the regional and national air show coordinators upon receipt of an air race application.

D. Air Racing Organizations. If AFS-800 determines that an air race organization has a credible program, policies, and procedures for determining air racing pilot competence, that organization will be given authorization to issue race pilot certificates. The current contact for each air race organization can be found at <http://intranet.faa.gov/FAAEmployees/org/linebusiness/avs/offices/afs/programs/airshows>. The organizations are normally listed by class, such as the following:

- International Formula One,
- Unlimited Division,

- AT-6/SNJ Racing Association, Inc.,
- Formula V Air Racing Association,
- Professional Race Pilots Assn. (Biplane),
- Sport Class, and
- Jet Class.

E. Typical Racecourses. A diagram of a typical air race site is shown in Figure 3-40. A diagram of a typical unlimited racecourse is shown in Figure 3-40A. Two examples of suitable air race site diagrams are shown in Figure 3-40B. The following paragraphs discuss the method of determining the various distances used.

F. Racecourse Design. A satisfactory pylon air racecourse design involves the shape of the course and its relationship to the area around the course, especially the spectator areas. Both of these factors depend upon the maximum speed of the racing aircraft and the maximum “g” loading (acceleration forces) that the aircraft are expected to encounter when flying the racecourse in a normal manner. The maximum height at which the aircraft are expected to fly during the race is also a factor.

G. Racecourse Speeds.

- 1) The following are typical speeds for each racing class:
 - Formula V: 160 mph,
 - Sport Biplane: 210 mph,
 - AT-6/SNJ: 225 mph,
 - International Formula One: 250 mph,
 - Sport Class: 300 mph, and
- 2) Unlimited and jet classes: 450 mph and higher.
- 3) As additional classes become active, they will be added to this list with appropriate speeds specified.
- 4) The maximum “g” loading for a race aircraft flying the course in a normal manner has been set at 3.5 “g’s.” In actual racing, where maneuvering and turbulence is encountered, momentary “g” loadings in excess of this figure can be expected.
- 5) The speed and “g” loadings permit the calculation of the minimum radius turn that should be permitted in the design of the racecourse. The formula for the turn radius for a given “g” loading and speed is shown below. (Using a value of 3.5 for “g,” the minimum turn radius is shown for each racing class below.)

Minimum Turn Radius Formula

$$R = \frac{V^2}{32.2 \times \sqrt{g - 1}}$$

R = Minimum turn radius (feet)

V = Aircraft speed in ft/sec or

V = knots $\times 1.689$

32.2 = Acceleration force of gravity (ft/sec²)

g = "g" force in turn

6) The angle of a turn (the change in course required to negotiate the turn) should be planned to avoid forcing a race aircraft to make the turn too sharply. A maximum turn angle that does not exceed 65 degrees has been found to be satisfactory.

H. Racecourse Show Line. During the race, aircraft occupy a raceway around the race course. The edge of this raceway closest to the spectator area is the show line, over which no aircraft is permitted to cross while racing.

1) The raceway width may vary from 150 feet to 500 feet in the various racing classes so that the aircraft may pass one another. The critical requirement is that no racing aircraft is permitted to cross over the show line during the race.

2) The minimum turn radius, the maximum turn angle, and the raceway width define the limits of a satisfactory race course. The race course relationship to the spectator areas or other populated area must also be defined. All racing classes require a distance of 500 feet between the primary spectator area and the show line.

3) An additional safety area is required to ensure that spectators are protected in the event that debris leaves a race aircraft. Should this occur while the aircraft is in a turn, the debris will follow a path tangential to the turn from the moment it departs the aircraft.

a) The theoretical straight-line distance to a point on the ground that the debris will follow (ignoring air resistance) depends upon aircraft speed and altitude. This distance is the scatter distance. A maximum racing altitude of 250 feet is acceptable for aircraft weighing in excess of 1,000 lb (presently, the AT-6/SNJ and the Unlimited class). A maximum racing altitude of 150 feet is acceptable for aircraft weighing 1,000 lb or less (presently the International Formula One, Sport Biplane, and Formula V classes). The scatter distance formula for each racing class is shown below.

Scatter Distance Formula

$$S = V \times \sqrt{\frac{2 \times A}{32.2}}$$

S = Scatter distance (feet)

V = Aircraft speed in ft/sec

(V = knots \times 1.689)

A = Maximum aircraft altitude (AGL) (150 or 250 feet)

32.2 = Acceleration of gravity (ft/sec²)

b) The theoretical location of all possible debris impact points from an aircraft in a turn is a circle whose radius is the square root of the sums of the squares of the turn radius and the scatter distance. This radius is the scatter radius.

Scatter Radius Formula

$$S = \sqrt{(R^2 + S^2)}$$

Sr = Scatter radius (feet)

R = Turn radius (feet)

S = Scatter distance (feet)

c) To provide an acceptable margin of safety, the difference between the turn radius and the scatter radius is multiplied by a safety factor of 1.5 and added to the turn radius to define the safety radius.

Safety Radius Formula

$$Sfr = R + 1.5 \times (Sr - R)$$

Sfr = Safety radius (feet)

Sr = Scatter radius (feet)

R = Turn radius (feet)

4) The critical turn with respect to the safety radius is the turn that enters the portion of the race closest to the spectators. The safety area is constructed as follows:

a) Bisect the course change angle for the critical turn;

b) Mark off the minimum turn radius for the class of aircraft racing, as shown in Figure 3-28A, from the pylon position to a point on the angle bisector; and

c) Draw an arc, whose radius is the safety radius, from the point described in subparagraph 3-151H3c) above. No spectators can be within this arc (Figure 3-40).

5) In some cases, it may be expedient to design the race course around the spectator area. While spectator area-to-show line distances are unchanged, the safety zone is now outside

the spectator area and is no longer a factor. Roads to this kind of a race course layout must be completely closed off to the spectator area during the race.

6) Race courses are normally flown in a counterclockwise direction (left turns). Problem sites may require flying the course in a clockwise direction (right turns). Other modifications of the race course, such as changing the angular relationship of the spectator line to move the crowd away from a turn pylon, or lengthening the race course to move the turn pylon away from the crowd, may also be necessary.

3-152 BALLOON MEETS AND COMPETITIONS.

A. Balloon Meets. Routine balloon ascensions can usually be conducted in accordance with the provisions of part 91, and no waiver is required. However, balloon competitions will likely require a certificate of waiver or authorization with appropriate special provisions to maintain the safety of the nonparticipating public.

B. Balloon Operations. Flight competitions by manned balloons often involve operations at horizontal and vertical distances less than those required by § 91.119(b) and (c). Operations at these altitudes are necessary to take advantage of varying wind conditions at different altitudes that are the balloonist's only means of directional control. These operations are acceptable when appropriate limitations are developed to ensure public safety and the safety of the participants.

C. Public Safety. Ballooning has grown significantly in recent years, and competitive tasks have been refined and standardized. The FAA's concern is that every effort is made to ensure public safety. The intent of § 91.119 should never be compromised when issuing waivers and developing special provisions.

1) Target areas must be under the control of event officials. The use of portable bull horns or public address systems provides an adequate means for crowd control, or for directing balloonists away from the target area in an emergency. Balloon landings are not normally permitted closer than 1,500 feet from the target or goal, although event officials may allow a reduction of this distance to 500 feet for safety considerations. Only balloon recovery ground support crewmembers and authorized event officials can be present at the landing site.

2) The relatively slow speed of balloons allows spectators to move from harm more easily than at an air show where fast moving aircraft are performing. Accordingly, the designated spectator area can be minimized to a 200-foot radius away from the designated balloon goal/target. IICs should ensure that the sponsors assure spectators remain clear of the goal/target area during balloon meets or competitions.

D. Balloon Competition Event Waivers. To be found eligible for a waiver of § 91.119(b) and (c), the applicant must prepare and maintain an organized manned balloon competition manual that has been found acceptable by the jurisdictional FSDO. The contents of the manual are the basis for issuance of the waiver. The applicant and the participants must comply with the balloon manual contents and requirements. No operations can be conducted

under a waiver except while in VFR conditions during the period from sunrise to sunset, as specified in § 91.155.

1) Event organizers should be asked to submit a set of competition rules when applying for a waiver. Although this is not a regulatory requirement, it should be encouraged for the sake of conformity and safety. These competition rules should generally conform to a recognized industry standard, such as those developed by the Balloon Federation of America (BFA) for events sanctioned by the BFA Competition Division.

2) A waiver of § 91.119(b) and (c) for organized balloon competitions can be issued based on submission of an application containing the proposed operations and contents of the organized manned balloon competition manual. (See subparagraph 3-152E below.)

3) Section 91.119(b) and (c) should be waived only to the extent necessary to accommodate the event while allowing an acceptable level of safety. Evaluation of the site by the IIC determines the actual separation distances for a specific event; however, the following minimum distances and special provisions must be observed.

a) Section 91.119(b) may be waived to allow flight over a congested area at an altitude of no less than 500 feet above the highest obstacle within a 500-foot horizontal radius of the balloon. This section of the regulation may only be waived within a specified maximum distance from designated launch sites and/or target areas. This designated area will be determined by the event organizer and the FAA; this area must also be clearly delineated in the event organizer's manual before the event. (A scaled map, drawing, and/or aerial photographs should be in the event organizer's manual before the event.) The designated area should be the minimum area necessary to accommodate the event, and the area should be consistent with the event organizer's ability to control operations. A waiver of § 91.119(b) should not be issued if the target area is so small that a normal descent (200 to 300 feet per minute) cannot be made.

b) Section 91.119(b) may be waived to allow flight above, but not less than 75 feet from, any open-air assembly of persons (designated spectator area) under the direct control of the event organizer.

c) Section 91.119(c) may be waived to allow flight over open water or sparsely populated areas, no closer than 200 feet horizontally to any person, vessel, vehicle, or structure.

E. Organized Manned Balloon Competition Manual. The following is a list of the minimum required topics that must be addressed in the competition manual for a balloon event. Other information may also be included (see Figure 3-41).

1) Responsibilities and Procedures:

- Duties of personnel,
- Registration and airworthiness determinations,
- Pilot qualifications,
- Pilot/crewmember briefing responsibilities,
- Copy of letter(s) of agreement, and

- Event flight crewmember qualifications, experience, and maximum numbers onboard each balloon for each type of event.

2) Ground Operations:

- Clear areas,
- Spectator areas (designated primary and potential secondary areas),
- Crowd control requirements, and
- Landowner relations/notification.

3) Flight operations:

- Areas of operations,
- Types of operations,
- Altitudes,
- Weather requirements,
- Communications requirements, and
- AT coordination.

4) The organized manned balloon competition manual must incorporate § 91.119(b) and (c) limitations as appropriate to the event in a form and manner acceptable to the FAA and the event organizer. The event organizer should describe in the manual as clearly as possible the manner of operations that are needed to comply with the event waiver.

5) The organized manned balloon competition manual must include a list and description of all events, tasks, and races to be included in the waiver.

F. Personnel. The organized manned balloon competition manual must contain the names of the following personnel who are responsible for the event:

- Flight director (event director),
- Person responsible for establishing and maintaining crowd control,
- Event organizer's FAA liaison, and
- Persons responsible for obtaining weather data and conducting the pre-event pilot and event flight crewmember briefings.

G. Letters of Agreement. In addition to the organized manned balloon competition manual, a letter of agreement clearly detailing all responsibilities may provide an excellent means of control. In the manual, the event organizer outlines the responsibilities assumed, such as crowd control, notification, communication, and briefing of participating pilots and event flight crewmembers. ATC identifies the services they provide, such as up-to-date weather, a portable tower, or direct communication line with the tower. The FSDO identifies the necessary aircraft and airman certification qualifications and site inspection requirements through the waiver process.

H. Balloon Event Flight Crewmembers. Only pilot and event flight crewmembers, as described in the organized manned balloon competition manual, may be carried onboard any balloon operating under the waiver issued to the event organizer.

1) Event flight crewmembers will be restricted to the minimum number required for the type of event as specified in the organized manned balloon competition manual. Event flight crewmembers should be kept to a minimum for competitive events.

2) All event flight crewmembers must have received appropriate training concerning their duties relative to the event, and must attend the event pilot and flight crewmember briefing before each event. These crewmembers must sign a statement that they have been briefed and that they are designated event flight crewmembers for the purpose of the specific event for which the waiver was granted.

3) The PIC of each balloon is responsible for obtaining the signed statements on a form furnished by the event organizer. The PIC will maintain this form during the event and return it to the event organizer and make it available to the FAA upon request.

4) Balloon event flight crewmembers are differentiated from ground support launch and recovery crewmembers.

I. Maximum Wind Speed. The maximum wind speed for launch and at the target zones is mutually determined by the event organizer/flight director and the FAA. Place these limitations in the operations manual. Determine the maximum wind speed limitations after considering the local terrain conditions and the competency of the participating airmen and the limitations of the aircraft. If a balloon does not have an FAA-approved flight manual, operating limitations can be found on the Type Certificate Data Sheet (TCDS). The actual means of determining the wind speed must be mutually agreeable to the FAA and the event organizer. The IIC and/or the event organizer/flight director may wish to consider moving the designated spectator area barriers if the wind speed is excessive.

J. Types of Competitive Tasks. Competitive tasks are exercises in navigation using changes in wind direction. The winner of a task is the balloonist who can best take advantage of changes in wind direction by ascending and descending. Event organizers generally engage launch directors to control staggered launch times and ensure safety for multiple launches. The following are some typical balloon competitive tasks, based on information provided by the BFA. See Figure 3-41 for detailed descriptions of the tasks.

- Pilot declared goal,
- Judge declared goal ,
- Multiple judge declared goal,
- Elbow,
- Hare and hound,
- Convergent navigational task,
- Fly on task,
- Gordon Bennett memorial,

- Watership down, and
- Key grab.

3-153 EVENT MANAGEMENT.

A. Management Organization.

1) The event organizer of an aviation event may be an individual, a group of individuals, or an organization that will designate a responsible person to act on all matters pertaining to an FAA-issued certificate of waiver or authorization.

2) The responsible person of an aviation event has the overall responsibility for the conduct of the air show in a safe manner and in accordance with the conditions contained in FAA Form 7711-1, issued for the air show.

3) The IIC should work closely with the responsible person to develop normal and emergency plans, briefings, and checklists.

B. Briefing (See Figure 3-41A). The importance of the participant briefing to the safe and successful conduct of a special aviation event cannot be overemphasized. At a safety briefing review all aspects of the flying, ground, and emergency procedures of the proposed air show. Conduct the briefing in such a way that each of the performers and air show personnel in charge of the air, ground, and emergency operations leaves the briefing with a clear understanding of their responsibilities and procedures to be followed in normal or emergency situations that may occur during the course of the aviation event.

1) The requirements for a briefing held at an aviation event are as follows:

a) Conduct a briefing before the beginning of an aviation event on each day of the event. A night show briefing can be incorporated into this briefing if all parties are present;

b) Carry out a briefing in an area as free of noise and other distractions as possible, and you must limit attendance to flight crews, appropriate flight crew support staff, parachutists, ground performers such as pyrotechnic teams, public announcers, and other key event personnel as determined by the air boss and/or IIC;

c) Verify each participant's attendance at a briefing by roll call or otherwise, and a record retained for submission to the IIC, if requested;

d) Performers who are not briefed are not permitted to participate in the aviation event covered in the briefing;

e) For team performances, only the team leader is required; however, a delegate may represent the team leader, provided the person is a pilot member of the team;

f) For an aircraft that is to be launched from a remote airfield, the briefing may be given to the aircraft's pilot by telephone; and

g) The briefing is conducted at a time as close to the performance time as practicable.

2) The briefing must cover the following points, at a minimum:

a) Key aviation event personnel (to include essential and event organizer personnel) are introduced and the means of communication with them is described.

b) Weather—the briefing should be given by a meteorologist if one is available, but may be given by a flight specialist or experienced pilot. The briefing need only cover aspects of the weather that are significant to the conduct of the aviation event such as the altimeter setting, cloud cover or ceiling, visibility, winds and temperature, density altitude, and other weather data forecast for the period of the event. If a low ceiling program (marginal weather) has been approved, the weather minima and a “low show” program must be briefed. If § 91.155 (cloud clearance) is waived, this must be briefed.

c) The airport airspace details, such as position, dimensions, height above MSL, the airspace in accordance with the NOTAM and/or any TFRs issued for the aviation event, local obstructions, warnings, and other pertinent information.

d) The method of coordinating AT, including type of coordination, such as positive control by ATS, advisory by Flight Service Station (FSS), or other. This aspect of the briefing must include air show frequencies and assigned radio call signs, if necessary. The method(s) of suspending the performance or recalling a performer by both radio and visual signals must be described.

e) The aviation event site, including the position of the primary spectator areas, secondary spectator areas, show lines, show center, air show demonstration area, hazards, direction of entry/exit lanes, holding areas, and alternate airports using aerial photographs, maps, scale diagrams, or other means of depiction.

f) The performance schedule will include a performer's on stage time and routine duration time. Additional timing information e.g., startup, taxi, takeoff, show and landing timings may be included at the discretion of the briefer. Participants, if required, are to note their onstage and offstage timings if required. Performers should be aware of the position of the act they follow and location for the start of their performance. During this portion of the briefing, other programmed flying events before, during, or after the air show portion itself, such as balloons, parachutists, flybys, and similar aerial displays, must be covered.

g) Wake turbulence can be a factor at any air show where there is a mix of participants and should be addressed in preparing the flight program and mentioned at the briefing as a precaution to participants.

h) The fire fighting and emergency services equipment available, including their location and the access routes to be kept clear, must be discussed.

- i) Pyrotechnic briefing, in accordance with subparagraph 3-147U. The pyrotechnic briefing card must be used by the shooter in command (Figure 3-39).
- j) Identification and location of all participating aircraft equipped with operable ejection seats, jettisoned fuel tanks, or ballistic parachute systems.
- k) Time check—to ensure all participants are using the same time for air show coordination.
- l) The flight operations director or other person responsible for flight operations ensures that each performer understands the applicable special provisions with respect to individual low-level authorizations contained in the certificate of waiver issued for the air show.
- m) Circling the Jumpers- All key personnel involved with circling the jumpers must complete the briefing described in Figure 3-42.
- n) Any other subjects as necessary.

NOTE: Examples of other subjects that have been included in briefings are medical factors affecting pilot performance (e.g., over-the-counter medication, pilot fatigue, heat stress), and factors affecting orientation of flight (e.g., over water or unusual terrain). It is suggested that, at the briefing on the final day of an air show, a “Departure Briefing” be included to advise participants of ATC procedures, etc., to be followed on leaving the air show site. Remind pilots that their departures are to be normal and that no “ad hoc” demonstrations are to take place during their departures.

3-154 WEATHER CONDITIONS.

A. Day.

- 1) Flight demonstrations will not be conducted unless the ceiling is at least 1,500 feet, and the visibility is at least 3 statute miles at the time of the demonstration.
- 2) Except for North American military performers, aerobatic maneuvers conducted by Category III aircraft during flight demonstrations will not be conducted unless the ceiling is at least 1,500 feet, and the visibility is at least 3 statute miles at the time of the demonstration.
- 3) The FAA monitor may adjust the minimum ceiling and visibility requirements at his or her discretion, but no less than 1,000 feet and 3 statute miles if:
 - a) Except for North American military performers, aerobatic maneuvers are conducted by Category III aircraft only within an operations area having a diameter of no more than 2 statute miles; and
 - b) To the surface as a result of the reduced weather conditions.

4) Originally scheduled aerobatic maneuvers are not modified or conducted in close proximity to the surface as a result of the reduced weather conditions.

5) The FAA monitor may specify a higher ceiling minimum and a higher visibility minimum where justified by the presence of surrounding terrain or other local condition.

6) Flight demonstrations may be conducted “clear of cloud” when the requirements have been met to waive § 91.155, cloud clearance requirements.

B. Night. The minimum weather conditions at night require a cloud base no lower than 2,500 feet and 3 statute miles visibility.

C. Military. Military participants must comply with minimum weather requirements established in the command-approved maneuvers package, except when the minimum weather requirements are less restrictive than the policy established in this order.

3-155 SPECIAL PROVISIONS. Special provisions are conditions, requirements, or limitations necessary to protect nonparticipating persons, property on the surface, and other users of the national airspace system. Each certificate of waiver or authorization must include special provisions as determined by the issuing FSDO.

A. Applicability. Many safety provisions are general in nature and are applicable to most aviation events. Other provisions may apply only to certain types of events. Provisions that appear on the waiver or authorization should be restricted to protective measures, controls, or requirements that are not otherwise specified by the regulations. Regulatory requirements that are not waived should not be included as special provisions. Waiver provisions never supersede aircraft airworthiness operating limitations.

B. Ensuring Safety. The special provisions ensure that the event can be conducted without an adverse effect on safety. Every waiver/authorization must contain special provisions to ensure an equivalent level of safety with the rules that are waived for the nonparticipating public and nonparticipating AT.

C. Use of Special Provisions. Some events require extensive and highly detailed special provisions, whereas the special provisions for other events can have less detail. In addition to variation among events, local conditions may have a significant impact on the necessary special provisions.

1) Special provisions may pertain to associated protective measures and control requirements that may not be specifically covered by the regulations. In addition, it may be necessary to increase one regulatory minimum in order to authorize safe deviation from another. For example, in order to permit aerobatic flight in Class D airspace, it might be necessary to increase the minimum visibility requirement to 5 miles or some other appropriate value.

2) When applicable, IICs should insert the name of the responsible person, found in Item 2 of the application, into the text of the special provisions to indicate the holder of the certificate of waiver or authorization.

3) Type the provisions with as little editorial change as possible onto the certificate of waiver or authorization form or on attached pages. Any special provisions add that are not listed on the air show Web site (see subparagraph D below) must have Regional or National Air Show Coordinator approval before inclusion except for ATC instructions. Only include applicable special provisions. Numbers and language can be inserted or changed to suit each event only when necessary, appropriate, and in accordance with the guidance in this handbook. Editorial comments enclosed in square brackets, [], should not be included on the certificate.

D. Examples of Common Special Provisions. The list of special provisions are found on the Internet at: <http://www.faa.gov/about/initiatives/airshow/waiver/>.

3-156 PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites. This task requires knowledge of regulatory requirements in part 91 and FAA policies and qualification as an ASI (Operations).

1) The inspector assigned this task is also responsible for the surveillance of the aviation event (see Volume 6, Chapter 11, Section 10, paragraph 6-2371.)

2) The inspector assigned this task and the subsequent surveillance must have completed OJT and participated in issuing a certificate of waiver and the surveillance of three aviation events with an inspector qualified in this task.

3) For an aviation event at which a military demonstration team performs, the inspector must have satisfactorily completed OJT (including participation in the feasibility study, the preseason evaluation meeting, waiver preparation, and air show surveillance) at an event that includes a military demonstration aerobatic team.

B. Coordination. This task requires prior coordination with the appropriate AT facility and the airworthiness unit.

3-157 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- 14 CFR parts 1, 61, 91, 103, 105, 133, and 139.
- AC 91-45, Waivers: Aviation Events.
- AC 103-7, The Ultralight Vehicle.
- AC 105-2, Sport Parachute Jumping.

B. Forms:

- FAA Form 7711-1, Certificate of Waiver or Authorization (Figure 3-34).
- FAA Form 7711-2, Certificate of Waiver or Authorization Application (Figure 3-32 and 3-33).
- FAA Form 8710-7, Statement of Acrobatic Competency (Figure 3-35).

- Transport Canada Form 26-0307, Statement of Aerobatic Competence (Figure 3-36).

C. Job Aids:

- Sample letters and figures.
- Job Task Analysis (JTA): 2.5.14, 4.7.2.

3-158 GENERAL PROCEDURES.

A. Determine if a Waiver or Authorization Is Required. If the event cannot take place in compliance with the regulations, a waiver is required.

1) If a waiver or authorization is not required, no further action is required with this task.

2) DD Form 2535, section IV, should be completed and signed if requested by an event sponsor. These forms are required for vehicle and static displays, as well as for military flight demonstrations and flybys.

NOTE: Note: DD Form 2535 can be found by going to one of the FAA air show sites and selecting one of the DOD teams. The team names are hyperlinked to the team Web sites from which you can view, print, or download this form. The USAF and the USMC requires the sponsor to apply on their Web site for any type of support, flying or static displays (see <http://www.faa.gov/about/initiatives/airshow/>).

3) If a waiver or authorization is required, brief the applicant on preparing FAA Form 7711-2.

B. PTRS. Open the PTRS File. Enter “1220” in the “Activity Code” box of the PTRS transmittal form and enter “PA” in the “National Use” box if the certificate of Authorization was issued for parachuting. Enter “1230” in the “Activity Code” box and enter “AS” in the “National Use” box if issued for an air show, “AR” for an air plane air race and “BE” of any type of balloon event. Enter “1231” in the “Activity Code” box and enter “WI” in the “National Use” box if a waiver will be issued and “NW” if no waiver will be issued for the operation requested.

C. Brief Applicant.

1) Advise applicant on the procedures to prepare FAA Form 7711-2.

2) Advise the applicant on the procedures to obtain the current editions of AC 91-45, AC 103-7 (if applicable), and AC 105-2.

3) Provide applicant with FAA Form 7711-2 (Figure 3-32 through 3-33A).

3-159 ADDITIONAL PROCEDURES FOR MILITARY APPLICANTS. In addition to the procedures in paragraph 3-158 and paragraph 3-160, conduct the following procedures for military applicants.

A. Determine if a Feasibility Study is Required. A FAA feasibility study is required when a waiver is required.

B. Conduct Feasibility Study.

1) Determine if an onsite inspection is required. An onsite inspection is required when:

- a) The inspector is unfamiliar with the area of the scheduled event;
- b) It has been more than 1 year since the last onsite inspection;
- c) There has not been an aviation event or flyby requiring a waiver there before;
- d) There may be new construction or other unique environmental changes near the site.

2) If an onsite inspection is required, review the documents submitted with the request for FAA completion of DD Form 2535, section IV. The documents that must be submitted by the event organizer are:

- a) Use templates of the proposed maneuvers overlay for the proposed site (the maneuvers package for the current year should be used to evaluate the site);
- b) Current 7.5-minute series Topographic Quadrangle Map published by the U.S. Geological Survey (USGS) (scale 1:24,000) for the area or current aerial photographs of the required airspace for the event, as necessary, to conduct the feasibility study.

3) The inspector will determine the following for an aerial demonstration:

- a) If the operating area is large enough to contain the aerobatic maneuvers;
- b) Whether proposed egress and ingress routes adversely impact safety; and
- c) Whether a waiver of § 91.119(b) and (c) is necessary.

4) The inspector will determine for a military flyby:

- a) If the operating area is appropriate to conduct a flyby at 1,000 feet above the highest obstacle, and 2,000 feet laterally of an obstruction;
- b) If it can be conducted in accordance with part 91 without a waiver.

- c) Whether proposed egress and ingress routes adversely impact safety.

C. Complete Applicable Section of DD Form 2535, Request for Military Aerial Support.

1) Fill in the appropriate FAA blocks on the form, with special emphasis on block 17;

- a) For an aerial demonstration, select one of these three classifications:

- 1. Satisfactory classification. A waiver can be issued following compliance with standard requirements of this chapter.

- 2. Conditional-satisfactory classification (most common). The remarks section specifies specific conditions that must be met, such as closing roads, evacuating buildings, compliance with a crowd control plan, and minimum altitudes on ingress and egress routes.

- 3. Unsatisfactory classification. The requested activity cannot be performed safely at the proposed site, and a waiver will not be issued.

- b) For a military flyby, select one of these three classifications:

- 1. Satisfactory. The flight can be conducted without a waiver.

- 2. Conditional-satisfactory classification. The remarks section specifies certain conditions that must be met and a waiver is required:

- A briefing between the PIC and ASI must be conducted before the flyby;

- Compliance with all non waived section of part 91 is required; and

- An authorization and agreement of the conditions from the commanding officer must be submitted to the ASI.

- 3. Unsatisfactory classification. Requested activity cannot be performed safely at the proposed site, and a waiver will not be issued.

- c) The ASI must ensure the information in the remarks section of DD Form 2535 is coordinated with the commanding officer authorizing the aerial demonstration or military flyby if a waiver is required.

- d) Sign the form.

- e) Retain a copy of DD Form 2535 for the office file. Return the original to the show sponsor.

D. Preseason Evaluation Meeting. Attend the preseason evaluation meeting for those events at which the USAF Thunderbirds or the U.S. Navy Blue Angels participate. At this meeting, the inspector should discuss the following:

- Proposed special provisions of the certificate of waiver or authorization,
- DD Form 2535,
- * Onsite evaluation,
- Conditional-satisfactory requirements,
- Safety concerns unique to the site,
- Past events, if appropriate,
- Review of request for a waiver to § 91.119(b) or (c) and submitted supporting documents, and
- Proposed egress and ingress routes and requests for flight along those routes below 500 feet AGL that will require FAA approval.

3-160 GENERAL PROCEDURES CONTINUED.

A. Evaluate FAA Form 7711-2. Using the information provided by the applicant and the background in section 1, review FAA Form 7711-2 for all pertinent information and supporting documents for the proposed aviation event. Accept strikeovers that are minor in nature and initialed by the applicant. Items 11 through 16 apply to air show waiver requests only.

1) Items 1 and 2—Name of Organization and Responsible Person. Ensure that the applicant has indicated the name of the organization in Item 1. Annotate “N/A” in Item 1 if an individual is applying. Annotate the name of the responsible person or the individual applying in Item 2.

2) Item 3—Permanent Mailing Address. Ensure that the applicant indicates the permanent mailing address of the organization named in Item 1 or the individual named in Item 2.

3) Item 4—Enter “N/A” since this pertains to banner towing only.

4) Item 5—Enter “N/A” since this pertains to banner towing only.

5) Item 6—Section and Number To Be Waived. Ensure that the applicant has listed all sections of the regulations to be waived.

6) Item 7—Description of Proposed Operation. Determine if the applicant has correctly indicated the type of aviation event.

7) Item 8—Area of Operation. Ensure that the applicant has listed the specific locations and the lateral and vertical limits of the aerial demonstrations.

8) Item 9—Beginning Date and Hour and Ending Date and Hour. Check for a beginning date and time, and an ending date and time for the aviation event.

9) Item 10—Aircraft and Pilots. Check for aircraft make and model, pilot names, certificate numbers and ratings, and full home addresses. A notation stating the show line category must be annotated with each make and model of aircraft. Ensure that parachutist names, license class, and addresses are included. Item 8 may be accepted with a statement, “A list

containing aircraft and pilot information (and/or parachutist information) will be furnished on [applicant enters a specific date and time].

10) Items 11 and 12—Event Organizer. Ensure that the applicant has indicated the event organizer (organization or individual) of the aviation event and the event organizer's address.

11) Item 13—Policing. Ensure that the applicant has described provisions for policing the event. Specify if a written formal plan has been provided to IIC. Item 11 may be accepted with a statement "A crowd control plan will be furnished on [applicant enters a specific date and time]" or "crowd control plan N/R" (if approved by IIC).

12) Item 14—Emergency Facilities. Ensure that the applicant marked all items that will be available at the time and place of the event.

13) Item 15—Air Traffic Control. Ensure that the applicant has described the method of controlling AT, including the arrival and departure of aircraft, requested TFR in accordance with § 91.145, as applicable, and has coordinated with the appropriate FAA ATC. Add a notation stating if TFR requested from ATC.

14) Item 16—Schedule of Events. Ensure that the applicant has listed all events and dates and times. Item 16 may be accepted with a statement "A final schedule of event will be furnished on [applicant enters a specific date and time]."

15) Item 17—Certification. Ensure that the applicant has signed and dated the application.

B. Determine if Application Is Complete.

1) Application Incomplete or Inaccurate. If the application is incomplete or inaccurate, complete the "FAA Action" block on FAA Form 7711-2 by marking "Disapproved." Write the reason for disapproval in the "Remarks" section. Return the application to the applicant.

2) Application Complete. If all pertinent information and supporting documents have been submitted with the application and the application is complete and correct, evaluate the proposed operation.

C. Evaluate Proposed Operation. Use the application information and the items listed below to determine if the proposed operation can be accomplished without an adverse effect on safety:

1) Review, if applicable, previous certificates of waiver or authorization issued for aviation events at the same location.

2) Coordinate the use of controlled airspace with the appropriate AT facility as soon as possible. Include any limitations or special conditions considered necessary by the ATS as part of the certificate of waiver or authorization.

3) Using the list of participating aircraft, verify that the airworthiness unit completed the required documents.

4) Using the list of participating aircraft and Table 3-1A, determine the required show line distance.

5) Accompanied by the applicant, conduct an onsite visit to sites used for the first time and to sites unfamiliar to the inspector.

a) Clarify or confirm information submitted with the application.

b) Verify the distances and the location of the show and reference lines.

6) Verify that NOTAM has been issued and is appropriate.

a) A copy of the published NOTAM should be attached to the waiver.

b) Brief the NOTAM at each pre-show briefing for all participants.

D. Review Waiver Requests for § 91.119. Determine if a waiver of § 91.119 is appropriate.

1) Waive § 91.119(b) and (c) only if the pilot will still be in compliance with § 91.119(a).

2) Waive § 91.119(b) and (c) only for non-aerobatic flight, while temporarily exiting or returning to the operating area. Use the standards discussed in section 1.

3) Waive § 91.119(c) only if unoccupied structures are involved, or to allow participating personnel, vehicles, or vessels to be positioned closer than 500 feet from the performing aircraft.

4) Waive § 91.119(b) and (c) for flight over structures, roads, vehicles, or vessels under the following conditions for the USAF Thunderbirds, U.S. Navy Blue Angels, and Canadian Defense Forces Snowbirds:

a) When the show line is generally aligned with a runway at an active airport;

b) When ingress and egress transition of the operating area coincides with established approach or departure paths used for the designated runway;

c) When aerobatic flight will not be conducted over any nonparticipating persons; and

d) When non-aerobatic flight over nonparticipating persons is not closer than 500 feet but may be as low as 200 feet above unoccupied obstacles less than 500 feet laterally from ingress/egress route while flying within 3 NM from the show center.

- 5) Consult with the regional air show coordinator as necessary.

E. Approve or Disapprove Waiver.

1) Waiver Disapproval. If the entire operation cannot be approved, complete the “FAA Action” block on FAA Form 7711-2 and state the reasons for disapproval in the “Remarks” section of the form. Return the application form to the applicant.

2) Waiver Approval. If the entire operation can be approved, complete the “FAA Action” block on FAA Form 7711-2 and develop the special provisions.

F. Develop Special Provisions List. Develop the list of special provisions appropriate to the aviation event using the information submitted with the application and the suggested special provisions on the air show internet site (<http://www.faa.gov/about/initiatives/airshow/>).

G. Issue Certificate of Waiver or Authorization.

- 1) Complete FAA Form 7711-1, (Figure 3-34) as follows:

- a) In the “Title” block, use “X’s” to mark out the inappropriate word.

- b) Enter the waiver holder’s and responsible person’s names and addresses as they appear in Items 1 and 2 on the application.

- c) Include a brief summary of the aviation event in the “Operations Authorized” block. For aviation events involving aerobatic flight, clearly define the dimensions of the affected airspace. In the case of parachute demonstration jumps, use the following statement, “Parachute demonstrations are authorized in accordance with § 105.21.”

- d) Except for parachute demonstrations, include in the “List of Waived Regulations” and “Title” blocks each specific regulation waived by the FAA. Ensure that the listed regulations correspond to those on FAA Form 7711-2 and conform to § 91.905. When many regulations are involved, list the specific rules on a separate sheet of paper and attach it to the certificate. Use the following statement, “A list of waived regulations is attached.”

- e) Place the total number of special provisions in the appropriate spaces in the “Special Provisions” block.

1. Type and sequentially number the special provisions on the reverse side of FAA Form 7711-1 or on separate pages.

2. Use only the special provisions, which apply to the operations in the waiver or authorization application.

3. Group the provisions by type of event, such as air show provisions or parachute demonstration jump provisions.

- f) Attach any additional pages to the certificate of waiver or authorization.

g) When an aviation event is scheduled for multiple days, uses a separate sheet to list the dates and times the certificate is in effect, if needed. Use the following statement: "See attached page [insert appropriate page number] for dates and times."

h) Have the jurisdictional FSDO manager or their designated representative, which may be either the assistant manager or another supervisor from within that jurisdictional FSDO sign FAA Form 7711-1.

2) Attach to FAA Form 7711-1 a copy of FAA Form 7711-2 and its supporting documents.

3) Distribute FAA Forms 7711-1 and 7711-2 as follows:

- a) Place a copy of both forms in the FSDO file;
- b) Send a copy of FAA Form 7711-1 to all affected AT facilities; and
- c) Return the original of both forms to the applicant.

H. PTRS. Make the appropriate PTRS entry.

3-161 TASK COMPLETION. Completion of this task results in one of the following:

- Issuance of a certificate of waiver,
- Issuance of a certificate of authorization, or
- Denial of an application for a certificate of waiver or authorization.

3-162 FUTURE ACTIVITIES.

- Surveillance of an aviation event.
- Possible cancellation of the waiver or authorization as a result of noncompliance with its provisions.
- Consideration of a future application for waiver or authorization from the same or other applicants.

Figure 3-24, Example of an Air Show Layout

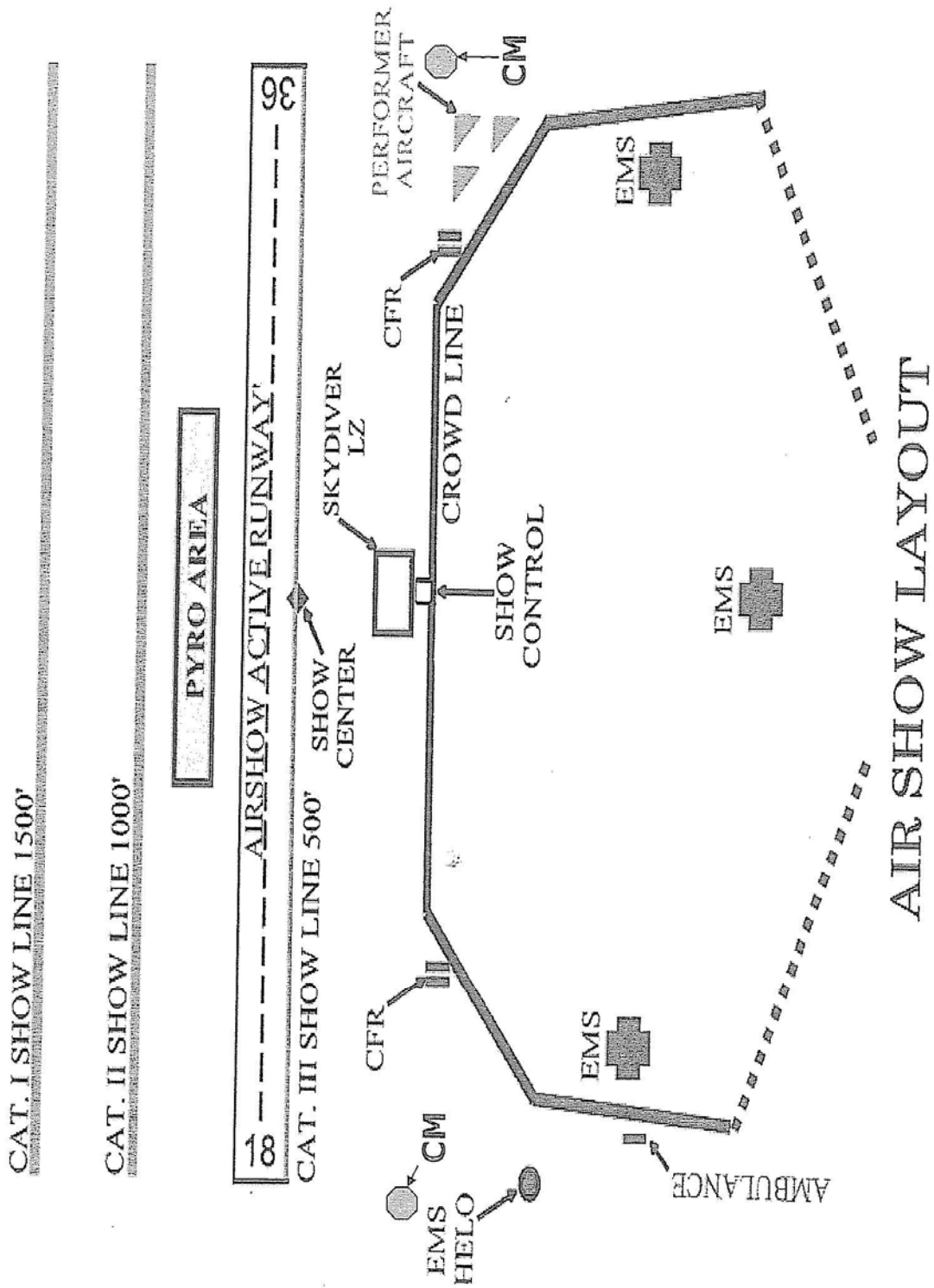


Figure 3-25, Minimum Separation Distance (200 Feet) Between Runway or Takeoff Area and the Primary Spectator Area

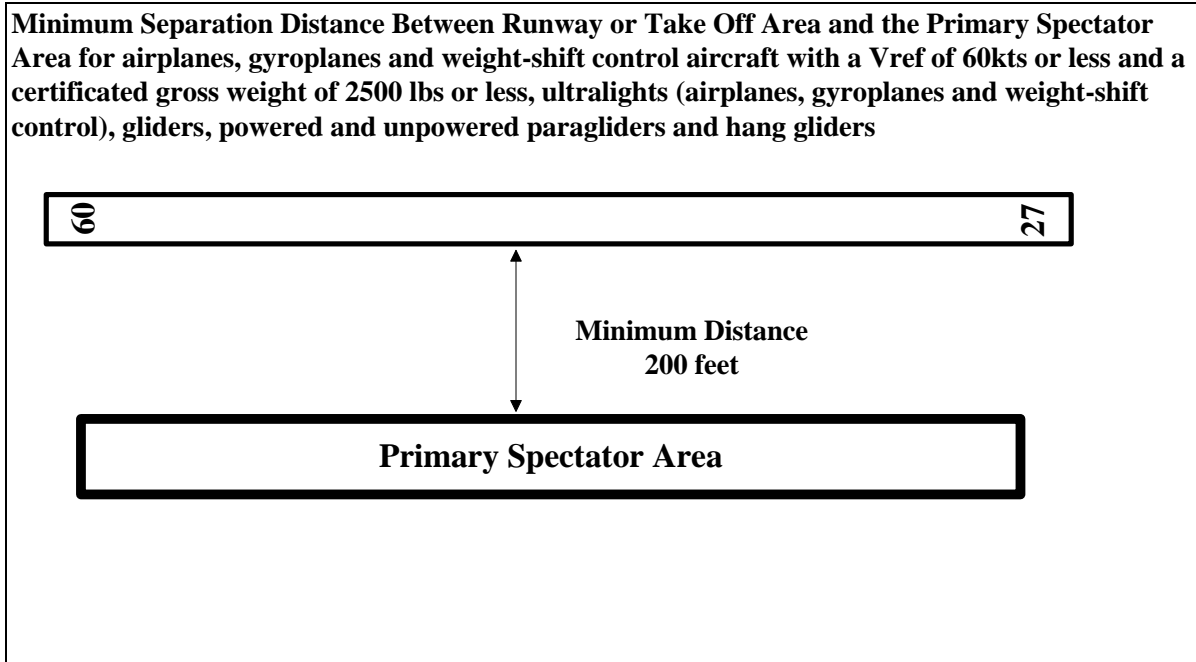


Figure 3-25A, Minimum Separation Distance (300 Feet) Between Runway or Takeoff Area and the Primary Spectator Area

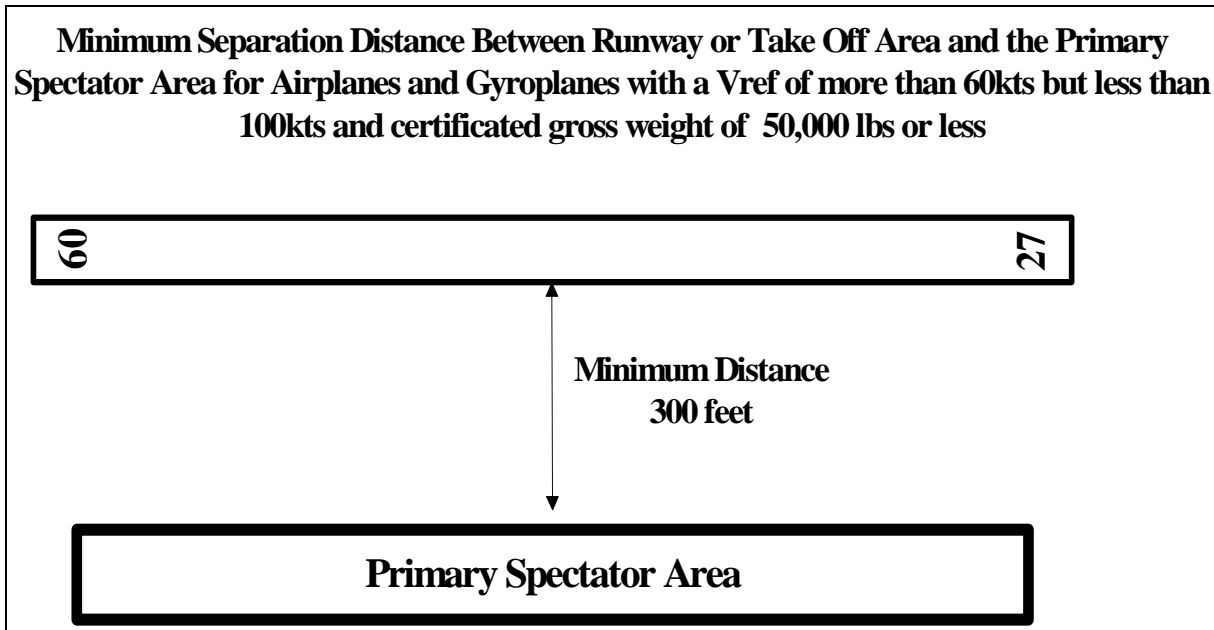
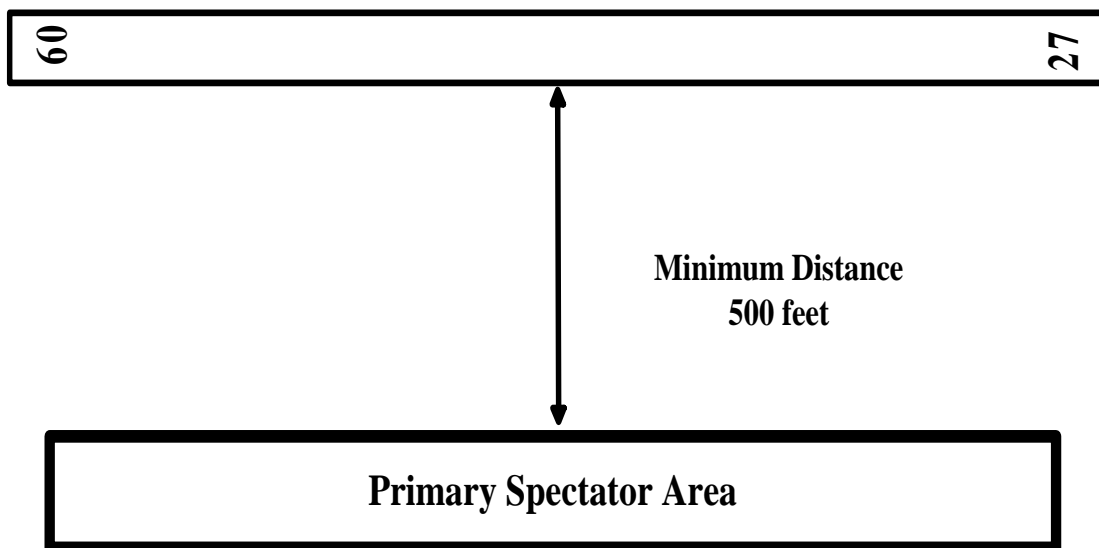


Figure 3-25B, Minimum Separation Distance (500 Feet) Between Runway or Takeoff Area and the Primary Spectator Area

Minimum Separation Distance Between Runway or Take Off Area and the Primary Spectator Area for Airplanes with Vref in excess of 100kts, Airplanes and Gyroplanes with a certificated gross weight in excess of 50,000 lbs and Airplanes and Helicopters conducting excessive, non-aerobatic maneuvering on takeoff or landing (comedy acts)



As per par. 3-147H(1), the minimum distances illustrated in this diagram for:

- a) single aircraft operations conducted on the centerline are to be measured to the runway centerline; and
- b) formation takeoff/landing operations, are to be measured to the runway edge.

Figure 3-26, Minimum Distance from Spectators for Category I

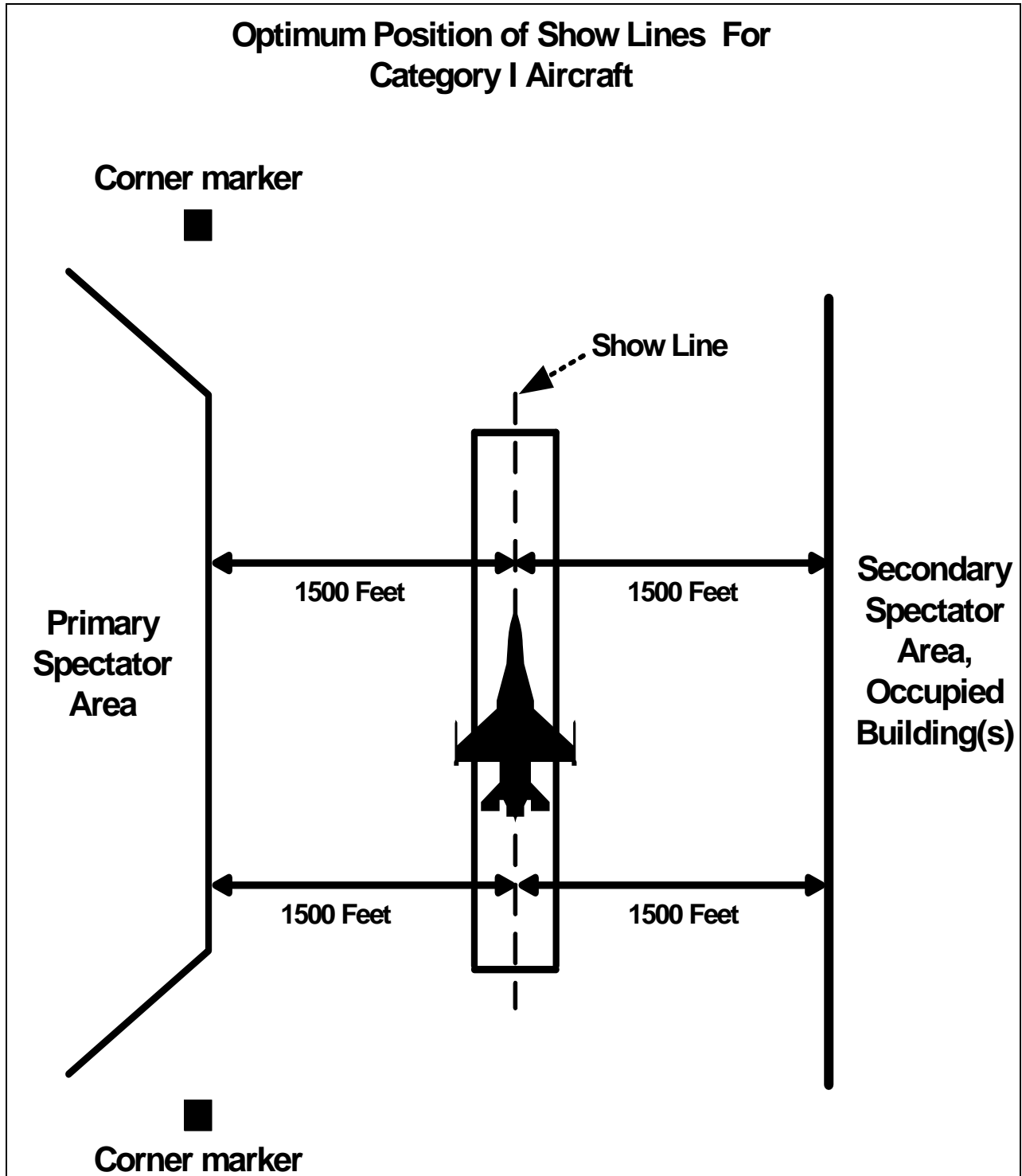


Figure 3-26A, Site Layout with Flying Display Area Less Than 1500 Feet from Show Line

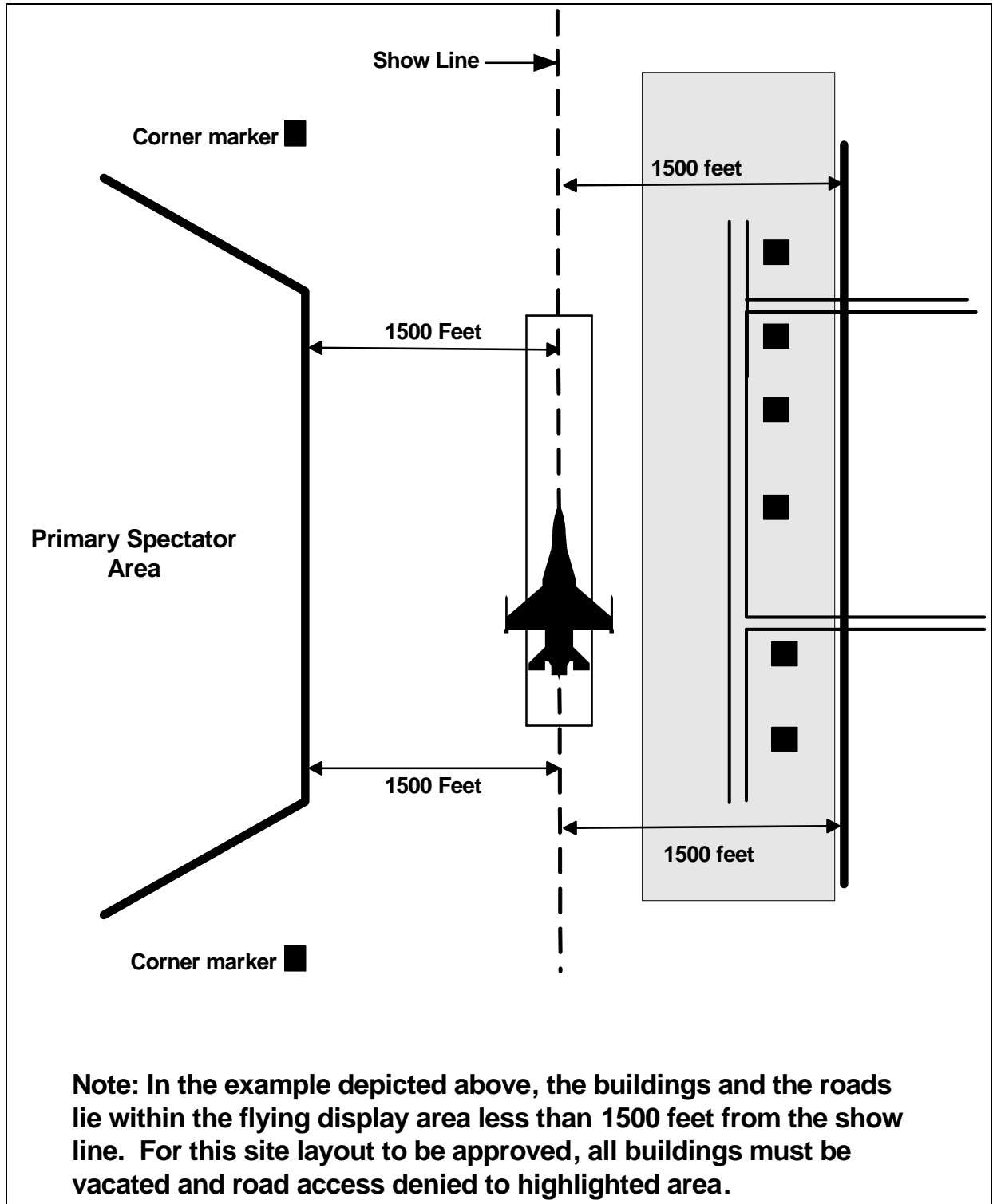


Figure 3-26B, Example of Category I Aircraft Formation on Show Line

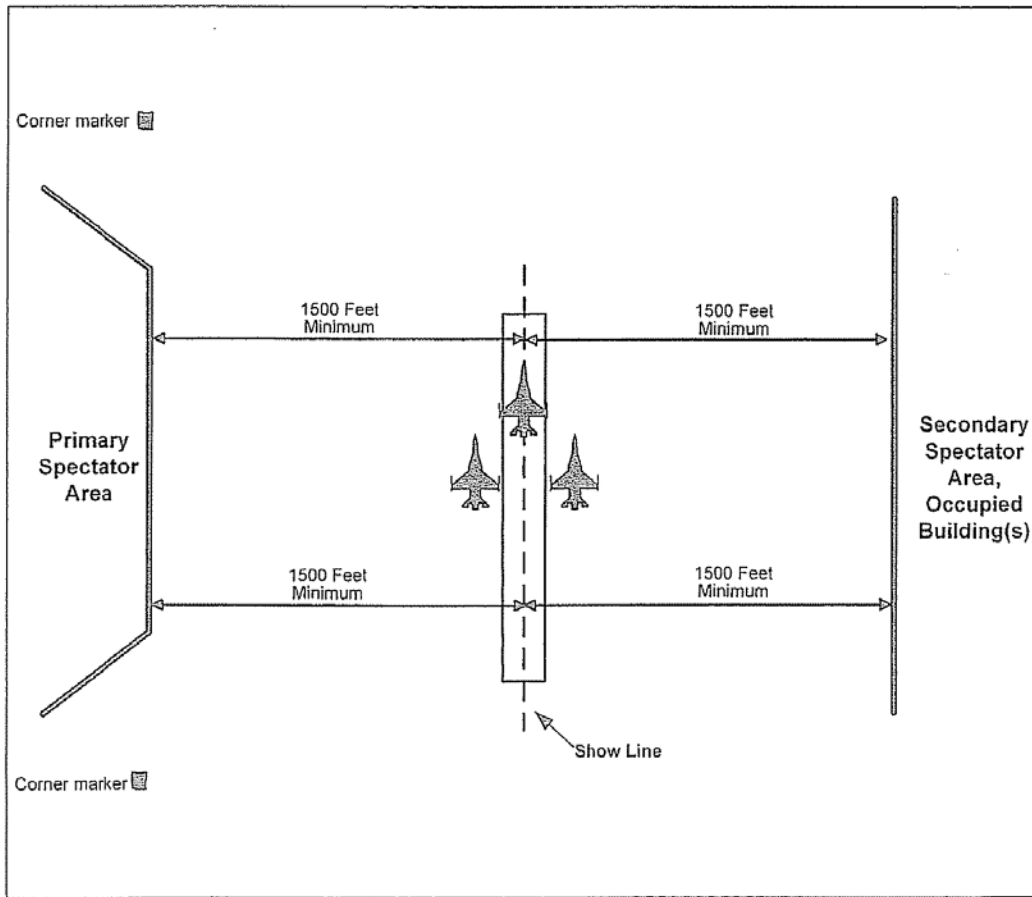


Figure 3-26C, Minimum Distance from Spectators for Category II Aircraft

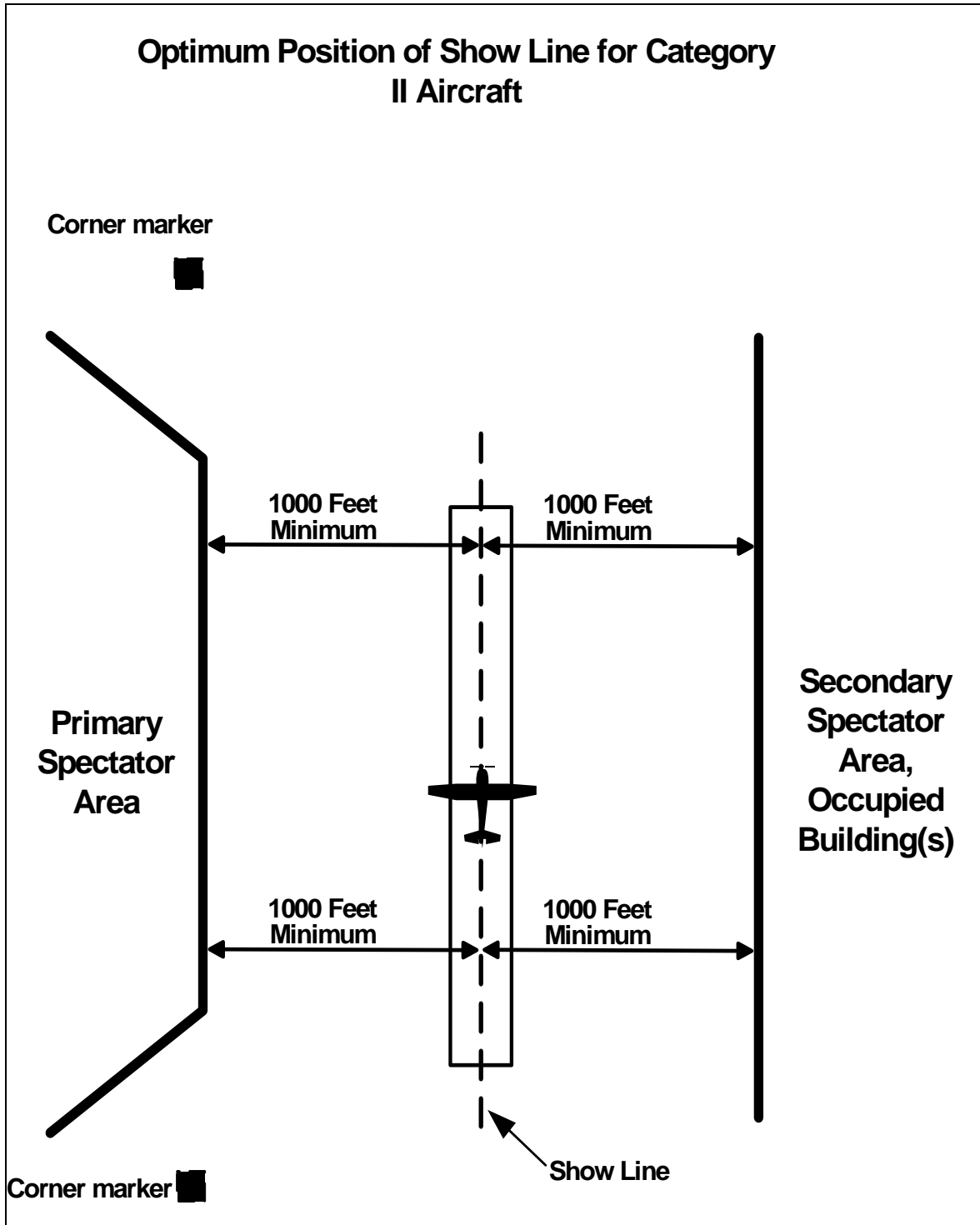
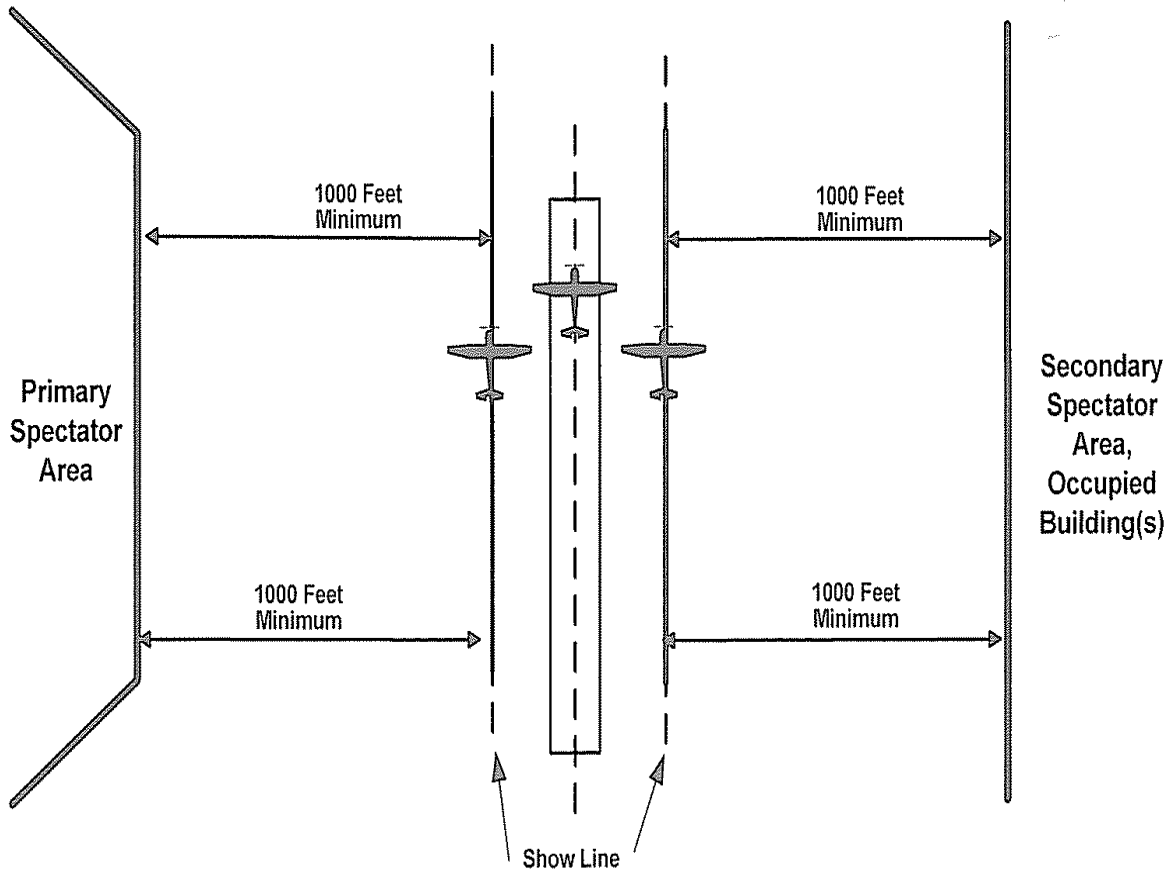


Figure 3-26D, Example of Category II Aircraft Formation on Show Line

Corner marker 




Corner marker 

Figure 3-27, Single Category III Aircraft in Minimum Width Flying Display Area

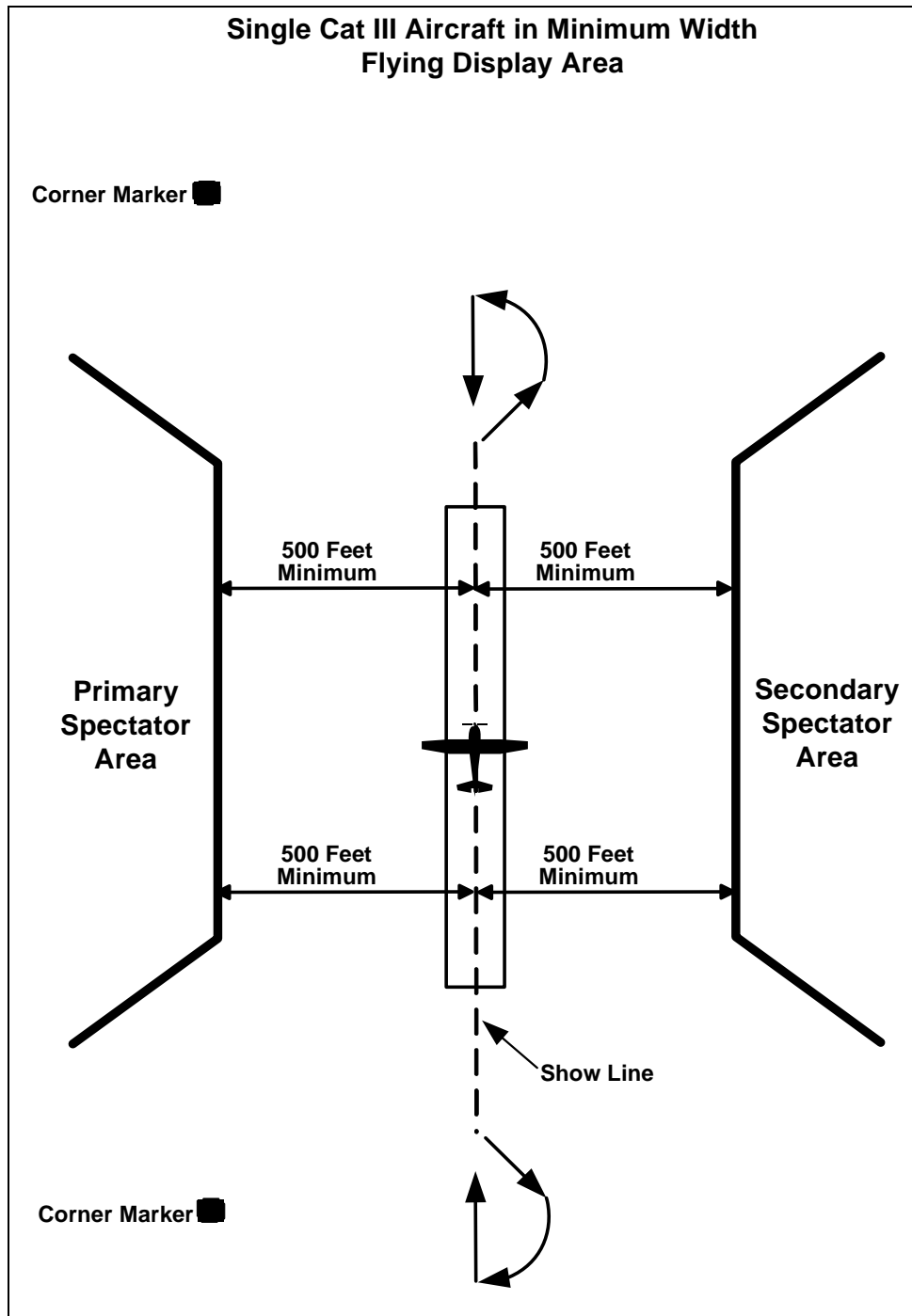


Figure 3-27A, Minimum Width of a Flying Display Area for Category III Aircraft Performing Lateral and/or Turning Maneuvers

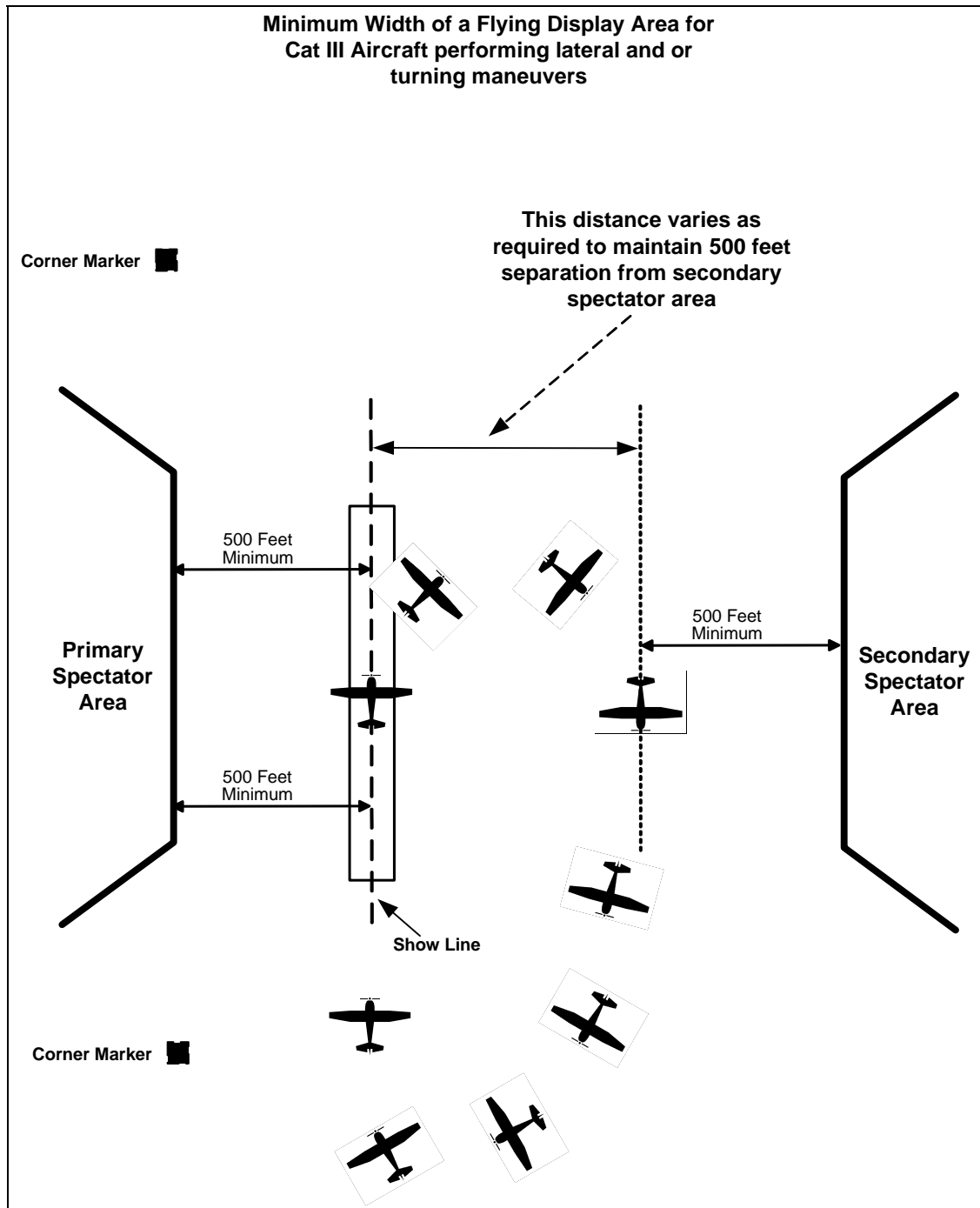
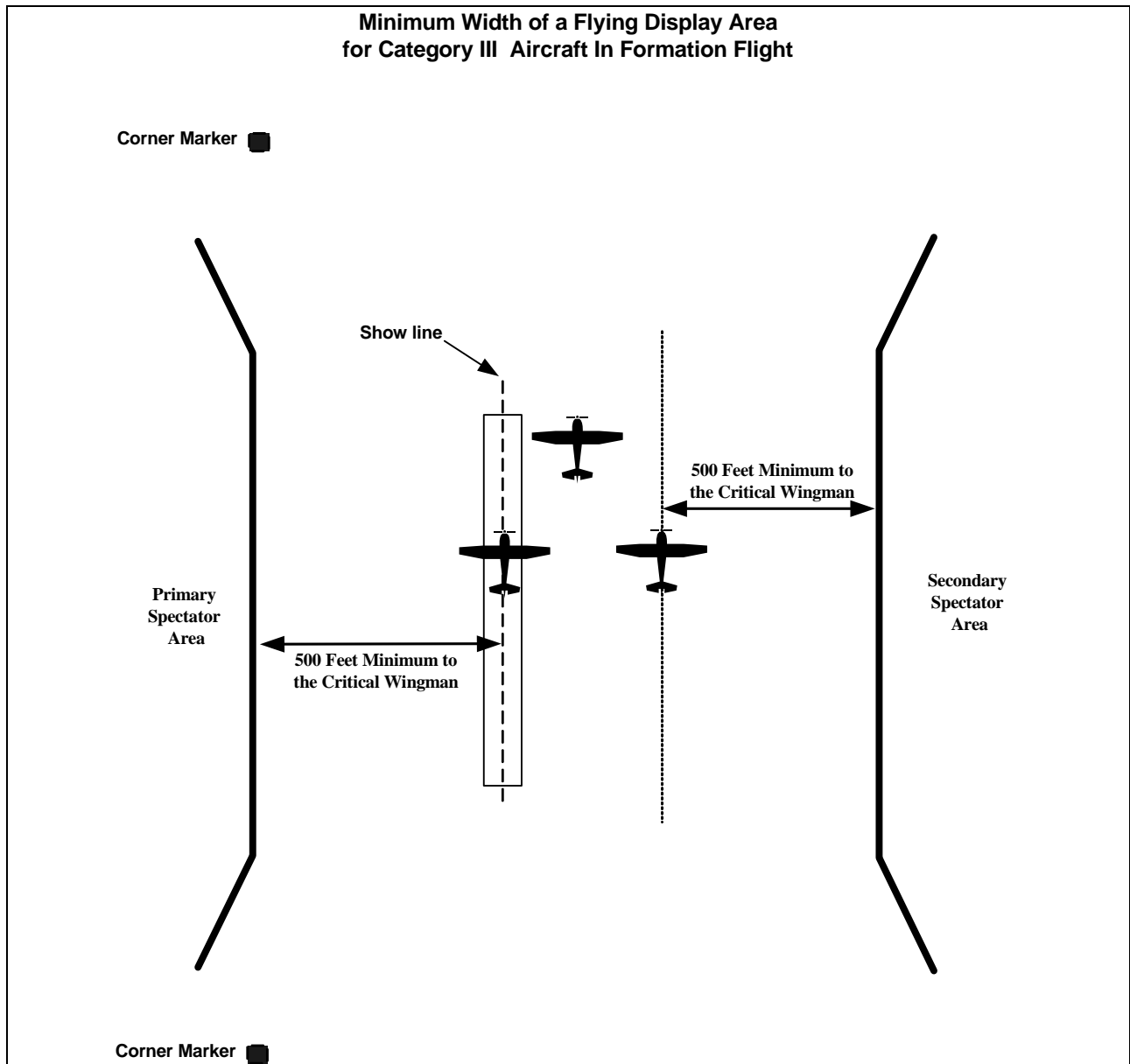


Figure 3-27B, Minimum Width of a Flying Display Area for Category III Aircraft in Formation Flight



Note: The diagram above depicts a situation where minimal distance between the Primary Spectator Area and Secondary Spectator Area is available. In this situation, the formation lead must adjust his/her track to ensure that the center the critical aircraft closest to the primary spectator is no closer than the 500 foot show line. In this situation minimum distance required between the primary spectator area and the secondary spectator is greater than 1000 feet to ensure the center of the critical aircraft closest to the secondary spectator area is no closer than 500 feet to the secondary spectator area. At air show sites that have Cat II and I aircraft performing aerobatic maneuvers, there is normally ample space available.

Figure 3-27C, Example of the Minimum Width of a Flying Display Area for Multiple Category II Aircraft Performing Lateral and/or Turning Maneuvers

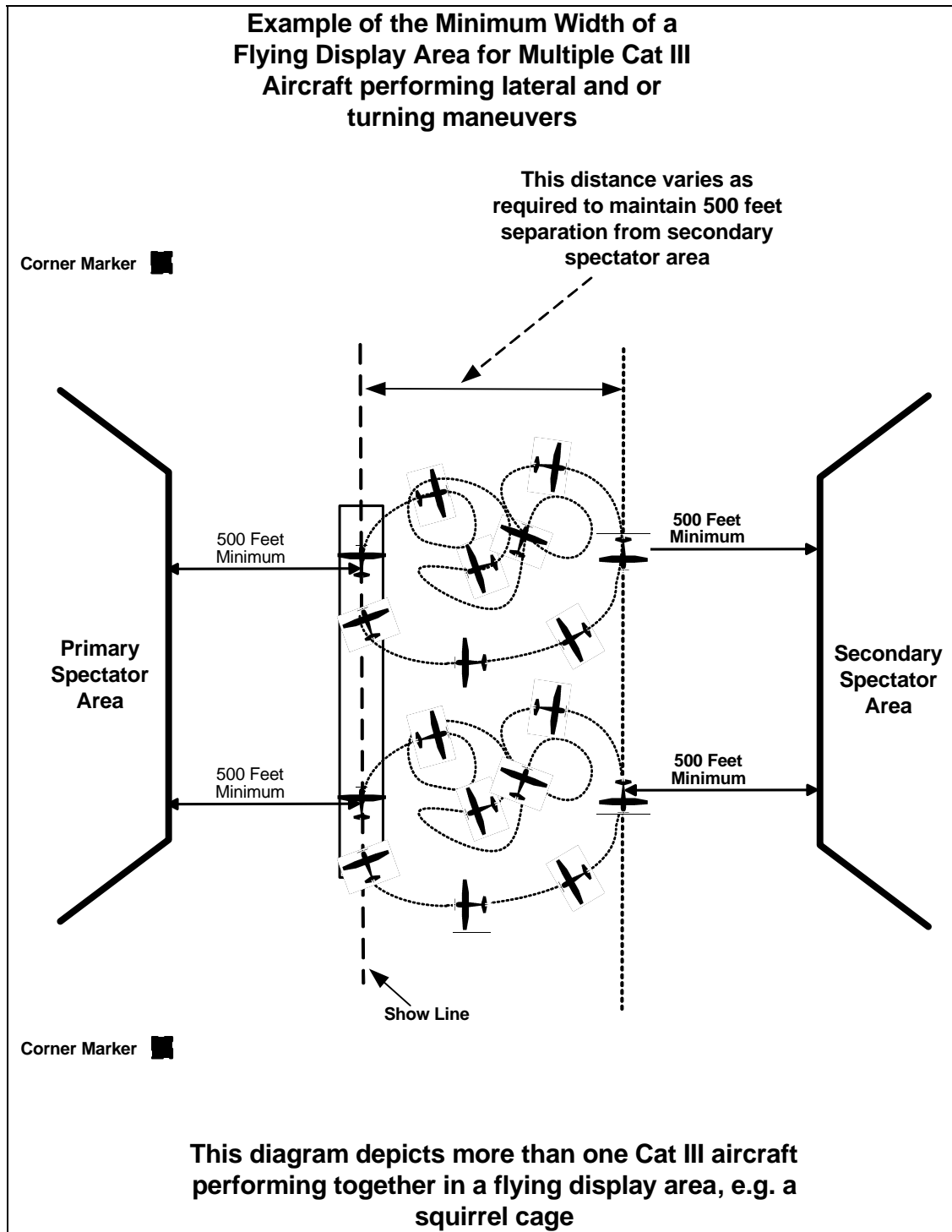


Figure 3-28, Aerobatic Maneuvers Performed After Aircraft Beyond Spectator Area

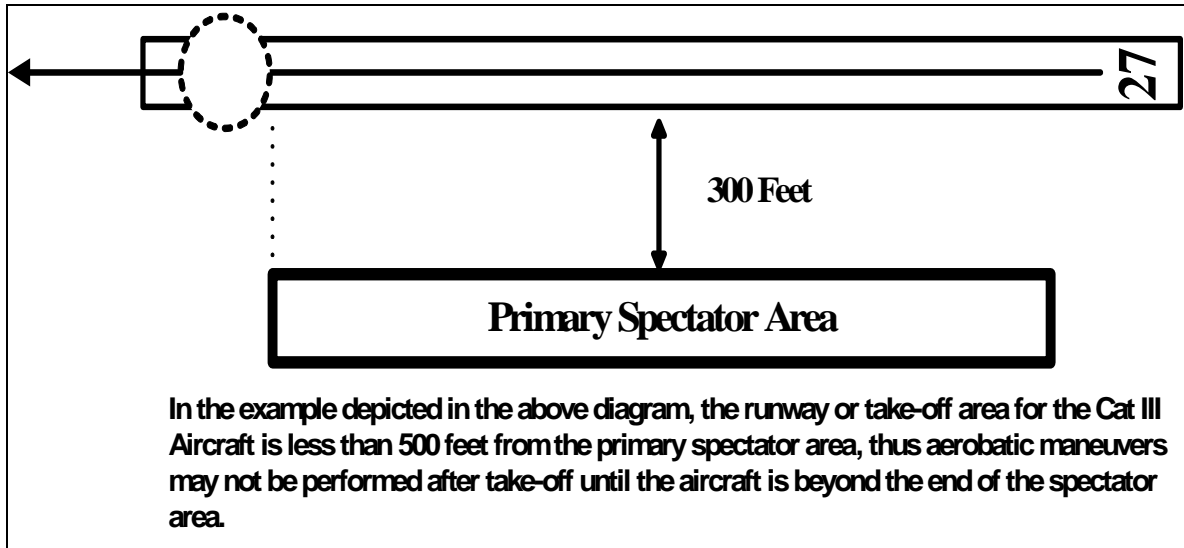


Figure 3-28A, Aerobatic Maneuvers Performed After Turn Away Performed

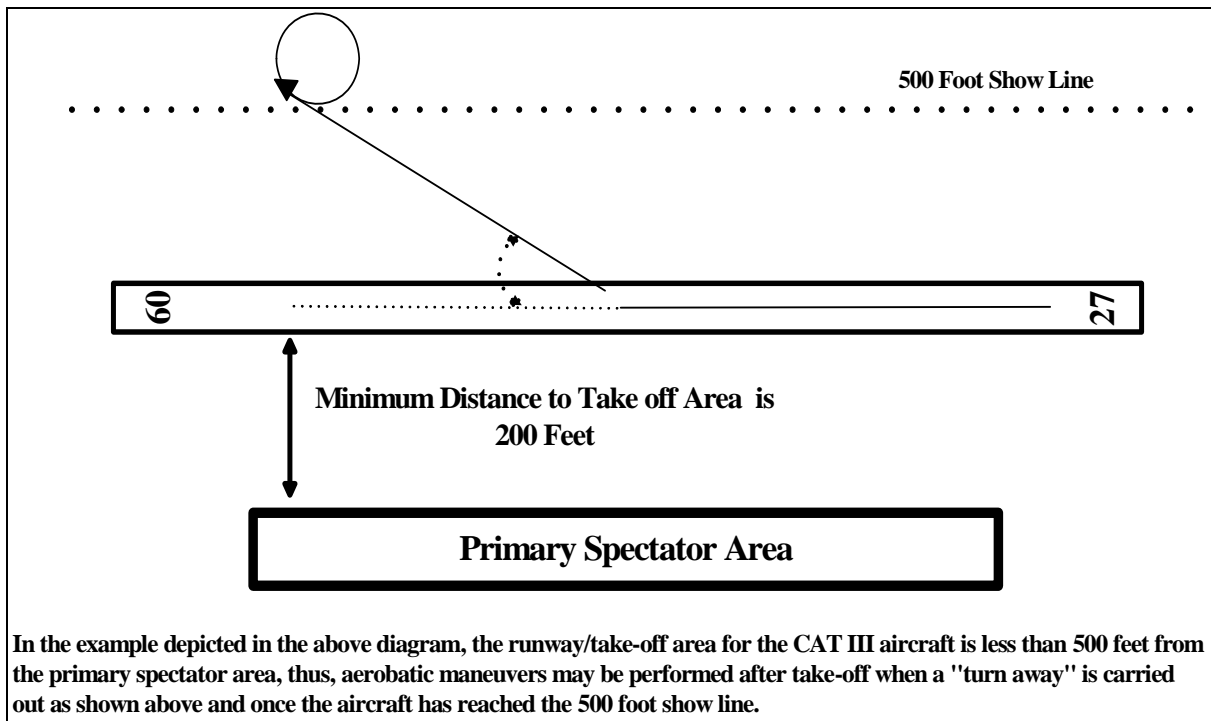


Figure 3-28B, Non-aerobatic Maneuvers by a Single Aircraft with an Energy Vector Directed Towards the Primary Spectator Area

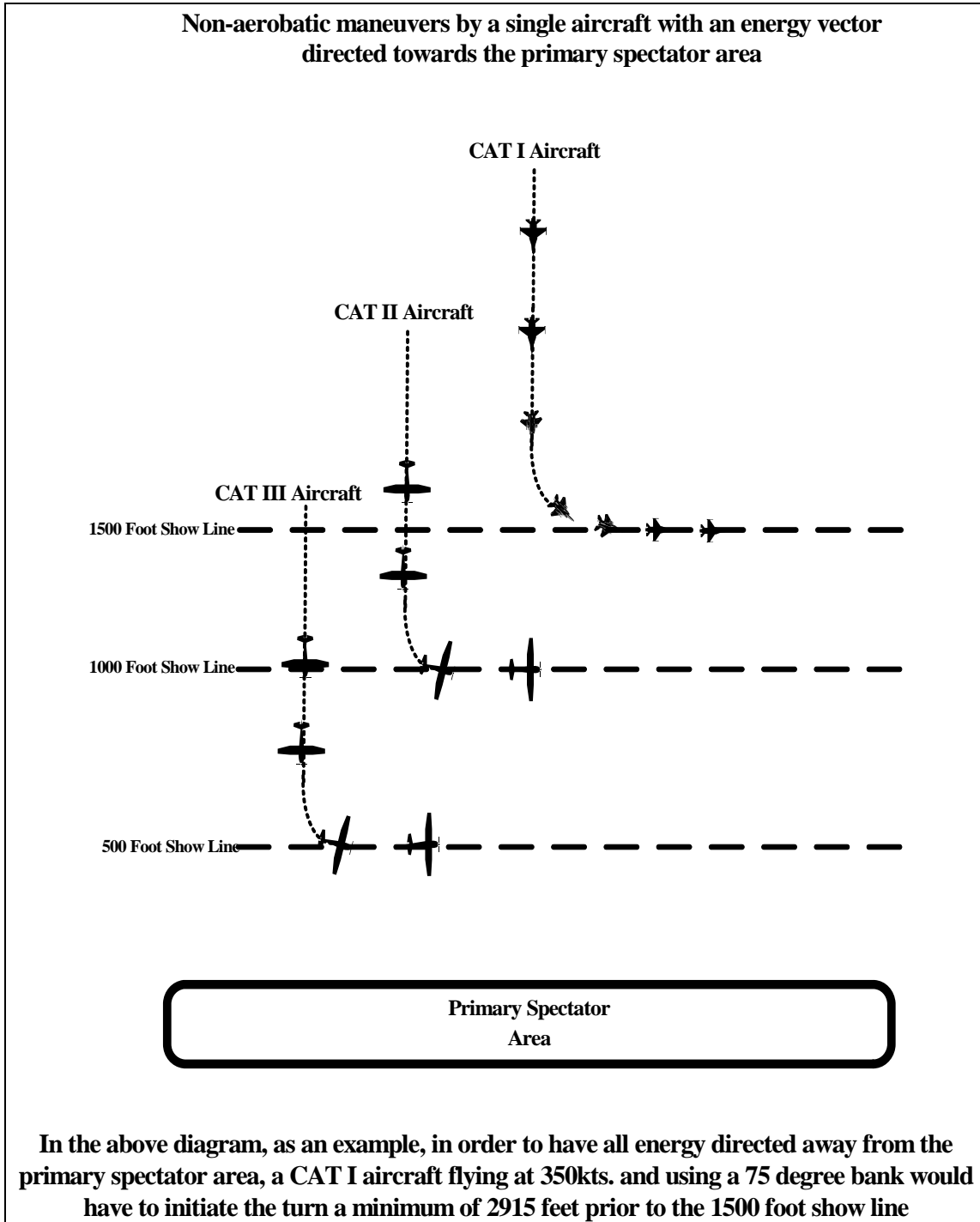


Figure 3-29, Typical Arc-in Review or Banana Pass

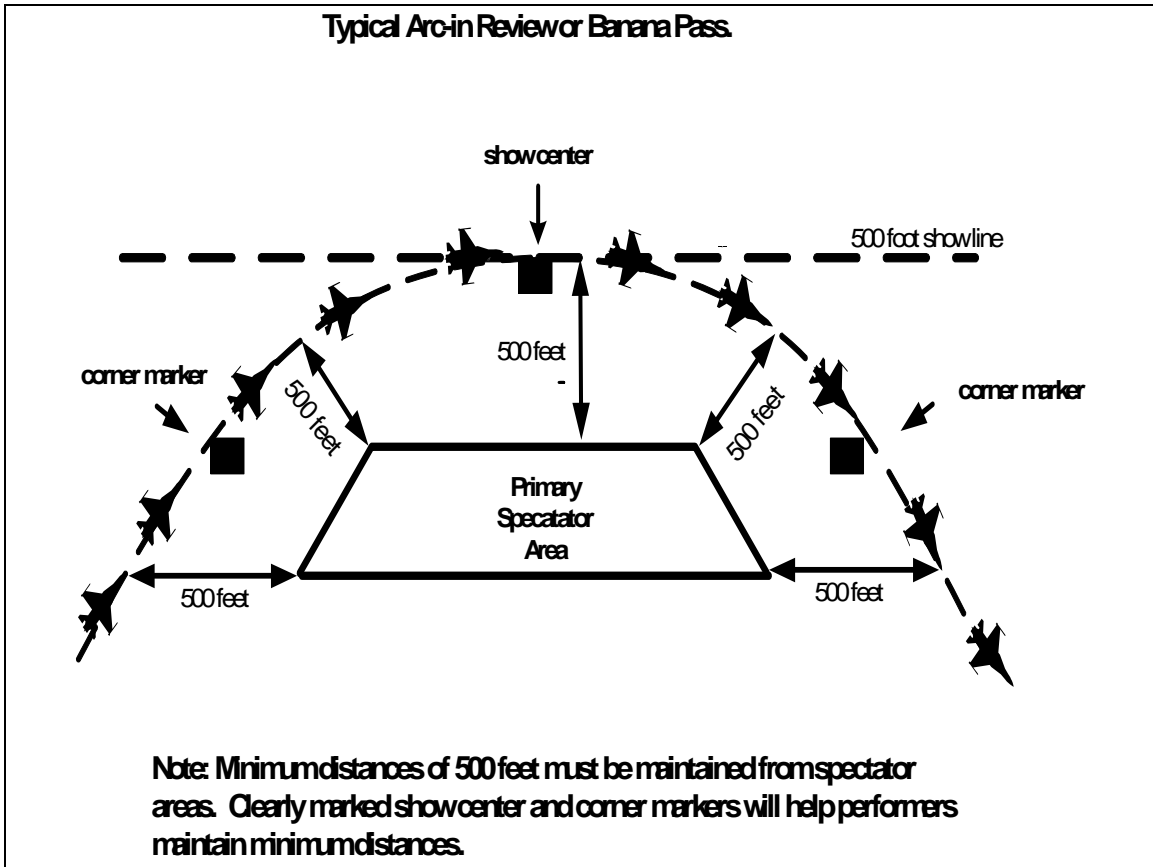


Figure 3-30, Helicopter Takeoff and Landing Areas

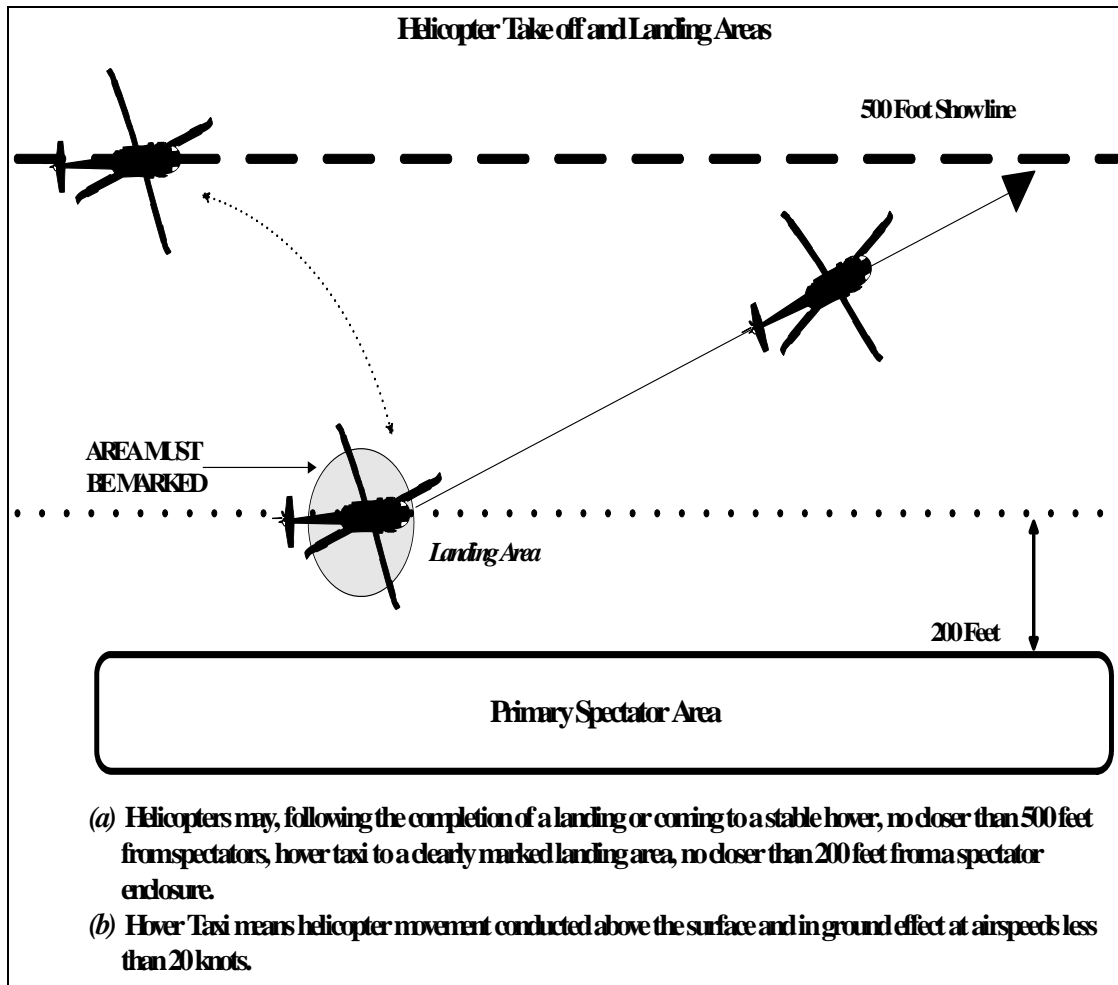


Figure 3-30A, Maneuvers Toward the Primary Spectator Area-360 Degree Turns Using Bank Angles of Less Than 90 Degrees

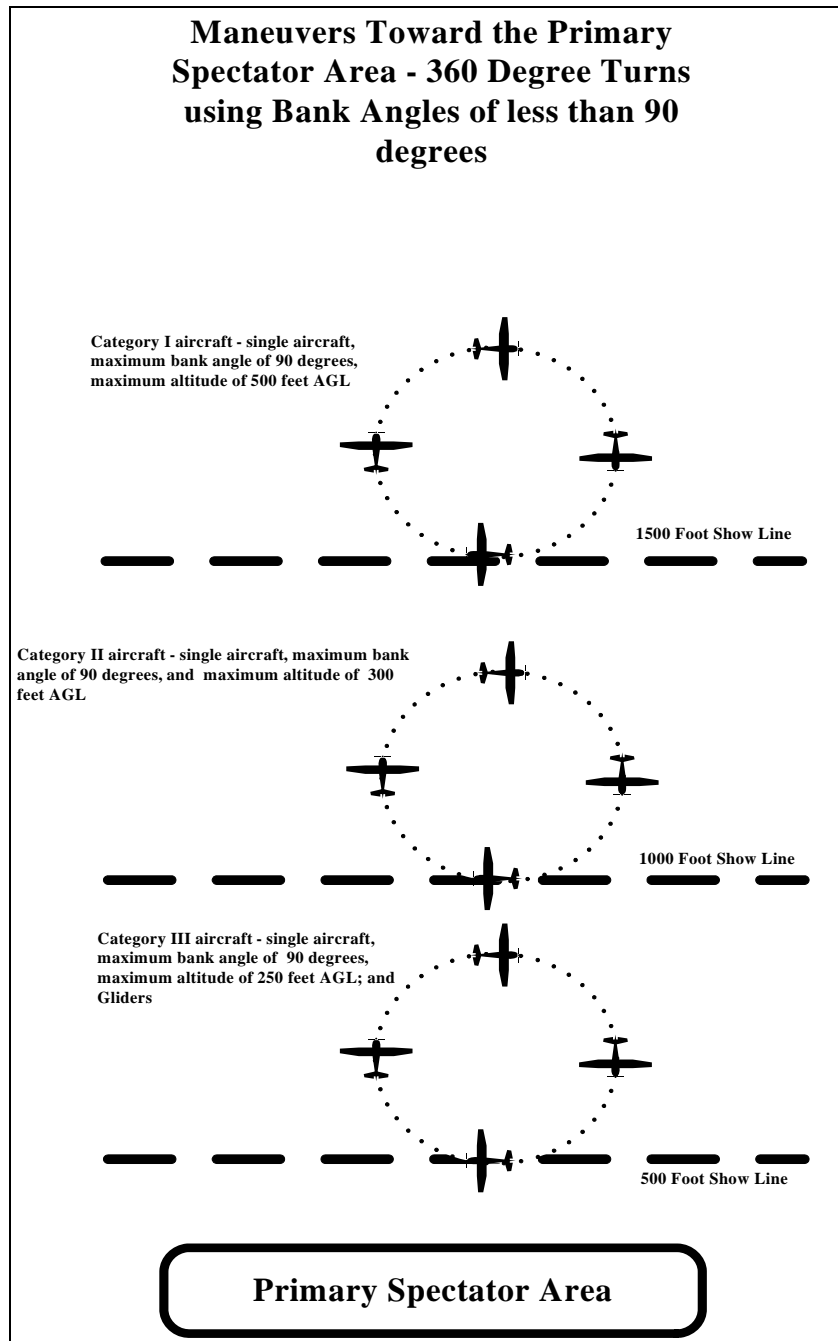


Figure 3-31, Aircraft Approach and Exit to and from a Flying Display Area Bordered by Congested Areas

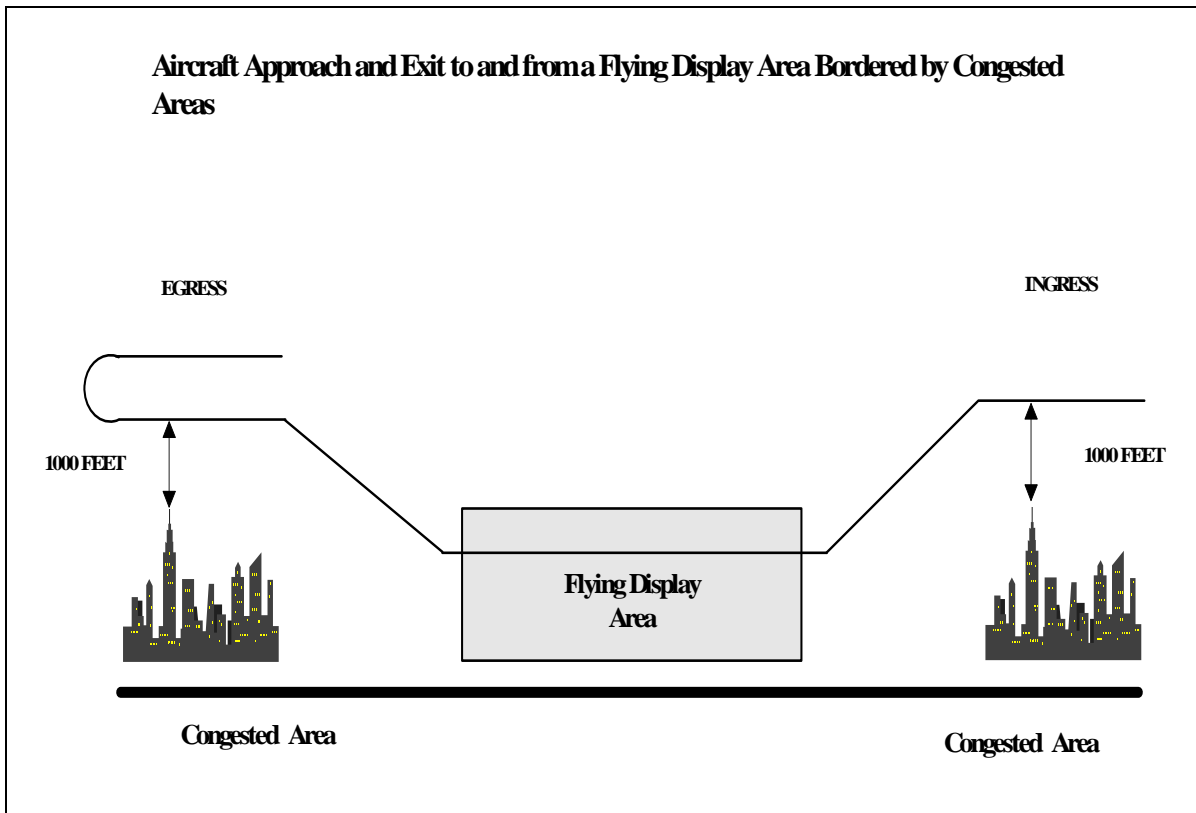



Figure 3-32, Sample FAA Form 7711-2, Certificate of Waiver Application

No certificate may be issued unless a completed application form has been received (14 C.F.R. 91. 101. and 105).

 <p>US Department of Transportation Federal Aviation Administration</p> <p>APPLICATION FOR CERTIFICATE OF WAIVER OR AUTHORIZATION</p>	From Approved: O.M.B. No.2120-0027 08/31/2008			
	APPLICANTS - DO NOT USE THESE SPACES			
	Region AWP		Date 03/14/2008	
	Action <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved – "Explain under "Remarks" Signature of authorized FAA representative			
INSTRUCTIONS				
Submit this application in triplicate (3) to any FAA Flight Standards district office. Applicants requesting a Certificate of Waiver or Authorization for an aviation event must complete all the applicable items on this form and attach a properly marked 7.5 series Topographic Quadrangle Map(s), published by the U.S. Geological Survey (scale 1:24,000), of the proposed operating area. The map(s) must include scale depictions of the flightlines, showlines, race courses, and the location of the air event control point, Police dispatch, ambulance, and fire fighting equipment. The applicant may also wish to submit photographs and scale diagrams as supplemental material to assist in the FAA's evaluation of a particular site. Application for a Certificate of Waiver or Authorization must be submitted 45 days prior to the requested date of the event. Applicants requesting a Certificate of Waiver or Authorization for activities other than an aviation event will complete items 1 through 10 only and the certification, item 17, on the reverse.				
1. Name of organization Hayward Air Fair		2. Name of responsible person Peter B. Pilot		
3. Permanent mailing address	House number and street or route number 100 Hesperian Blvd	City Hayward	State and ZIP code CA 94545	Telephone No. 510-555-1212
4. State whether the applicant or any of its principal officers/owners has an application for waiver pending at any other office of the FAA. N/A				
5. State whether the applicant or any of its principal officers/owners has ever had its application for waiver denied, or whether the FAA has ever withdrawn a waiver from the applicant or any of its principal officers/owners. N/A				
6. FAR section and number to be waived 91.107, 91.117, 91.119(b) and (c), 91.121, 91.155 and 91.303				
7. Detailed description of proposed operation (Attach supplement if needed) Air Show with Category I, II and III show lines for aerobatic aircraft and parachuting demonstration (See Certificate of Authorization). Fly-bys of aircraft in all three categories.				
8. Area of operation (Location, altitudes, etc.) Hayward Airport, from surface to 8,000 ft. MSL within 5 Nm.				
9a. Beginning (Date and hour) 06/27/2008 13:00:00		b. Ending (Date and hour) 06/27/2008 17:30:00		
10. Aircraft make and model (a)	Pilot's Name (b)	Certificate number and rating (c)	Home address (Street, City, State) (d)	
Pitts S2A	Harry Actor	1234567 ATP	123 Main Street, Hayward, CA 94545	
PT-17	Gene Smith	123654 CPL	10 10th Avenue, Deca City, TN 10101	
SK-61	Chuck Aileron	777777 CPL	1 Last Street, Nowhere, CA 45459	
BL-66	John Jay	111 ATP	25 House St., Fremont, CA 94544	
(Additional information to be submitted when available)				

FAA Form 7711 -2 (9-08) Supersedes Previous Edition



Figure 3-32A, Sample FAA Form 7711-2, Certificate of Waiver Application (Back)

ITEMS 11 THROUGH 16 TO BE FILLED OUT FOR AIR SHOW/AIR RACE WAIVER REQUESTS ONLY.		
11. The air event will be sponsored by: Hayward Air Fair		
12. Permanent mailing address	House number and street or route number 100 Hesperian Blvd	City Hayward
	State and ZIP code CA 94545	Telephone No. 510-555-1212
13. Policing (Describe provisions to be made for policing the event.) Hayward Police Dept., Civil Air Patrol and Girl Scouts		
14. Emergency facilities (Mark all that will be available at time and place of air event.) <input type="checkbox"/> Physician <input checked="" type="checkbox"/> Fire truck <input checked="" type="checkbox"/> Other - Specify <u>Medical Evacuation Helicopter</u> <input checked="" type="checkbox"/> Ambulance <input checked="" type="checkbox"/> Crash wagon		
15. Air Traffic control (Describe method of controlling traffic, including provision for arrival and departure of scheduled aircraft.) Hayward Air Traffic Control Tower and Air Boss. No scheduled air carrier flights at this airport		
16. Schedule of Events (include arrival and departure of scheduled aircraft and other periods the airport maybe open.)		
Hour (a)	Date (b)	Event (c)
1300	06/27/2008	Opening ceremonies with three airplanes circling six jumpers exiting at 7,500 feet. (See jump Authorization)
1315		Harry Actor in Pitts S2
1325		Gene Smith in Stearman with a wing walker
1340		Air National Guard F-15 fly-by with four airplanes
1345		Aerobatic helicopter
1355		Canadian Snowbirds
1430		Air Guard fly-by with C-130 and two helicopters doing an air refueling demonstration
1440		Clown act by John Jay in an Intrastate (See attachment for remainder of show.
<i>If sufficient space is not available, the entire schedule of events may be submitted on separate sheets, in the order and manner indicated above.</i>		
Please Read > The undersigned applicant accepts full responsibility for the strict observance of the terms of the Certificate of Waiver or Authorization, and understands that the authorization contained in such certificate will be strictly limited to the above described operation.		
17. Certification - I CERTIFY that the foregoing statements are true.		
Date	Signature of Applicant	
Remarks		

FAA Form 7711-2 (8-08) Supersedes Previous Edition

Figure 3-33, FAA Form 7711-2, Application for Parachuting Authorization

No certificate may be issued unless a completed application form has been received (14 C.F.R. 91. 101. and 105).

 US Department of Transportation Federal Aviation Administration		From Approved: O.M.B. No.2120-0027 08/31/2008		
		APPLICANTS - DO NOT USE THESE SPACES		
		Region Western Pacific	Date 06/09/2008	
APPLICATION FOR CERTIFICATE OF WAIVER OR AUTHORIZATION		Action <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved – "Explain under "Remarks"		
		Signature of authorized FAA representative 		
INSTRUCTIONS				
Submit this application in triplicate (3) to any FAA Flight Standards district office. Applicants requesting a Certificate of Waiver or Authorization for an aviation event must complete all the applicable items on this form and attach a properly marked 7.5 series Topographic Quadrangle Map(s), published by the U.S. Geological Survey (scale 1:24,000), of the proposed operating area. The map(s) must include scale depictions of the flightlines, showlines, race courses, and the location of the air event control point, Police dispatch, ambulance, and fire fighting equipment. The applicant may also wish to submit photographs and scale diagrams as supplemental material to assist in the FAA's evaluation of a particular site. Application for a Certificate of Waiver or Authorization must be submitted 45 days prior to the requested date of the event. Applicants requesting a Certificate of Waiver or Authorization for activities other than an aviation event will complete items 1 through 10 only and the certification, item 17, on the reverse.				
1. Name of organization Big Time Skydivers		2. Name of responsible person Allen Gold		
3. Permanent mailing address	House number and street or route number 456 Hesperian Blvd	City Hayward	State and ZIP code CA 94545	Telephone No. 866-111-222
4. State whether the applicant or any of its principal officers/owners has an application for waiver pending at any other office of the FAA. N/A				
5. State whether the applicant or any of its principal officers/owners has ever had its application for waiver denied, or whether the FAA has ever withdrawn a waiver from the applicant or any of its principal officers/owners. N/A				
6. FAR section and number to be waived None				
7. Detailed description of proposed operation (Attach supplement if needed) Sky diving exhibition for Hayward Air Fair. Three (3) jumpers with smoke, pyrotechnics, flags and streamers. One jump for opening ceremony, all out on one pass.				
8. Area of operation (Location, altitudes, etc.) Hayward Airport, 6.7 Nautical miles on the 114 degree radial.				
9a. Beginning (Date and hour) 06/27/2008 13:00:00		b. Ending (Date and hour) 06/29/2008 13:30:00		
10. Aircraft make and model (a) Cessna 182	Pilot's Name (b) Charles B. Lindburg	Certificate number and rating (c) 1630988	Home address (Street, City, State) (d) 240240 Park Stree, Hayward, CA 94545	
List of Jumpers attached				

FAA Form 7711 -2 (8-08) Supersedes Previous Edition

Figure 3-33A, FAA Form 7711-2, Request for Parachuting Authorization (Back)

▶ ITEMS 11 THROUGH 16 TO BE FILLED OUT FOR AIR SHOW/AIR RACE WAIVER REQUESTS ONLY.				
11. The air event will be sponsored by: XYZ Charity				
12. Permanent mailing address	House number and street or route number 1234 Anystreet Drive	City Anycity	State and ZIP code AA 12345	Telephone No. 515-555-1212
13. Policing (Describe provisions to be made for policing the event.) 				
14. Emergency facilities (Mark all that will be available at time and place of air event.)				
<input type="checkbox"/> Physician <input type="checkbox"/> Fire truck <input checked="" type="checkbox"/> Other - Specify <u>EMS team</u> <input type="checkbox"/> Ambulance <input type="checkbox"/> Crash wagon _____				
15. Air Traffic control (Describe method of controlling traffic, including provision for arrival and departure of scheduled aircraft.) 				
16. Schedule of Events (include arrival and departure of scheduled aircraft and other periods the airport may be open.)				
Hour (a)	Date (b)	Event (c)		
1300	June 28, 2008	Three jumper skydiving exhibition with smoke, flags and streamers		
1330		Jump exhibition completed		
1300	June 29, 2008	Repeat same three jumper exhibition		
1330		Jump exhibition completed		
<i>If sufficient space is not available, the entire schedule of events may be submitted on separate sheets, in the order and manner indicated above.</i>				
Please Read		The undersigned applicant accepts full responsibility for the strict observance of the terms of the Certificate of Waiver or Authorization, and understands that the authorization contained in such certificate will be strictly limited to the above described operation.		
17. Certification - I CERTIFY that the foregoing statements are true.				
Date 06/24/2008	Signature of Applicant			
Remarks Jump rmaster Allen Gold USPA D Pro 12344 5,555 Pro Joe Smith USPA D Pro 123456 2,345 jumps Robert Jones USPA D 898990 644 jumps				

FAA Form 7711-2 (8-08) Supersedes Previous Edition


Figure 3-34, Sample FAA Form 7711-1, Certificate of Waiver

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION CERTIFICATE OF WAIVER OR AUTHORIZATION	
ISSUED TO City of Hayward	
ADDRESS 100 Hesperian Blvd., Hayward, CA 94545	
This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.	
OPERATIONS AUTHORIZED AEROBATIC DEMONSTRATIONS AND FLY BYS AT THE HAYWARD AIRPORT, HAYWARD, CA, WITHIN FIVE (5) NAUTICAL MILE RADIUS OF THE CENTER OF THE AIRPORT FROM THE SURFACE TO 15,000 FEET MSL, EXCLUDING THE AIRSPACE ABOVE SPECTATORS OR OCCUPIED BUILDINGS.	
LIST OF WAIVED REGULATIONS BY SECTION AND TITLE 91.117 Aircraft Speed, 91.119 (b & c) Minimum Safe Altitude, 91.155 Distance from Clouds, 91.303 Aerobatics	
STANDARD PROVISIONS	
1. A copy of the application made for this certificate shall be attached to and become a part hereof. 2. This certificate shall be presented for inspection upon the request of any authorized representative of the Administrator of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations. 3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein. 4. This certificate is nontransferable.	
NOTE---This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.	
SPECIAL PROVISIONS	
Special Provisions Nos. <u>1</u> to <u>38</u> inclusive, are set forth on the reverse side hereof. "See Attached" <input type="checkbox"/>	
This certificate is effective from <u>06/27/2008</u> to <u>06/29/2008 1300 to 1700 daily</u> , inclusive, and is subject to cancellation at any time upon notice by the Administrator or his authorized representative.	
BY DIRECTION OF THE ADMINISTRATOR	
<u>Western Pacific</u> (Region)	<u>Mr. Fred A. Alvarez</u> (Signature)
<u>June 27 2008</u> (Date)	<u>Hayward FSDO Manager</u> (Title)

FAA Form 7711-1 (7-74)

AFS Electronic Forms System - v2.2

Figure 3-35, FAA Form 8710-7, Statement of Aerobatic Competency

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION STATEMENT OF ACROBATIC COMPETENCY	
PILOT <p style="text-align: center;">J. J. JONES</p>	
TYPE CERTIFICATE/NUMBER <p style="text-align: center;">COMMERCIAL 1234567</p>	
ISSUANCE DATE <p style="text-align: center;">03-14-2008</p>	EXPIRATION DATE <p style="text-align: center;">12-31-2009</p>
GENERAL AVIATION OPERATIONS INSPECTOR (Signature) <div style="text-align: center;">  J. J. SMITH ANE-BED-FSDO </div>	

FAA Form 8710-7 (5-79)


MANEUVER LIMITATIONS <p style="text-align: center;">NONE</p>	
ALTITUDE LIMITATIONS <p style="text-align: center;">LEVEL II</p>	AUTHORIZED AIRCRAFT <p style="text-align: center;">PITTS SPECIAL</p>
I understand that this statement of competency does not authorize deviation from FAR 91 except as defined by waiver thereto, or to the terms of Special Provisions contained in any waiver to FAR 91.	
PILOT (Signature) <div style="text-align: center;">  </div>	

Figure 3-36, Transport Canada Form 26-0307, Statement of Aerobatic Competency



TRANSPORT CANADA TRANSPORTS CANADA STATEMENT OF AEROBATIC COMPETENCY ATTESTATION DE COMPÉTENCE EN VOLTIGE AÉRIENNE	
PILOT / PILOTE <p style="text-align: center; font-size: 1.2em;">JOHN DAVID UPWRIGHT</p>	
PILOT LICENCE / LICENCE <p style="text-align: center; font-size: 1.2em;">CA 123456789</p>	
DATE OF EVALUATION / DATE DE L'EVALUATION <p style="text-align: center; font-size: 1.2em;">FEBRUARY 01, 2008</p>	EXPIRATION DATE / DATE D'ÉPIRATION <p style="text-align: center; font-size: 1.2em;">DECEMBER 31, 2009</p>
ISSUING INSPECTORS NAME AND SIGNATURE (PLEASE PRINT) NOM ET SIGNATURE DE L'INSPECTEUR DE LA DÉLIVRANCE DE L'ATTESTATION (SVP LETTRES MOULÉES) WAYNE HARPER 	
MANOEUVRE LIMITATION / LIMITES DES MANOEUVRES <p style="font-size: 1.5em;">SOLO AEROBATICS</p>	
ALTITUDE LIMITATIONS/LIMITES D'ALTITUDE <p style="text-align: center; font-size: 1.2em;">LEVEL 3 500 FT</p>	AUTHORIZED AIRCRAFT/AÉRONEF AUTORISÉ <p style="text-align: center; font-size: 1.2em;">PITTS</p>
PILOTS SIGNATURE / SIGNATURE DU PILOTE 	
26-0307(96.04)	

Figure 3-37, Sample Endorsement for Increase Angle of Pitch and Bank

“I have observed Mr. /Ms. [pilot’s full name]_____, Certificate Number _____, execute maneuvers up to 90 degrees of pitch and bank and find him/her proficient and competent in those maneuvers in the following Make and Model of airplane: _____.”

This endorsement may be entered in the logbook or issued in the form of a letter. This endorsement may only be made by an FAA operations inspector, an ICAS aerobatic competence examiner or a designated pilot examiner authorized to administer a practical flight test in this make and model of airplane.

Figure 3-38, Sample Aircraft Status and Inspection Form

Sample Aircraft Status and Inspection Form

N- _____ S/N _____ AC M/M _____

Inspection/Item Pending	Hours/Date:	Next Due	
Annual or Progressive Inspection			
100 Hour (If required)			
Static System Check			
Altimeter Check			
Transponder Check			
ELT Battery			
AD Number	Description	Hours/Date Completed	Next Due

I certify this information accurately represents the applicable information from this aircrafts maintenance records and that this aircraft and the aircraft records were inspected on this day and determined to be in an airworthy condition.

A&P or IA Name: _____ Signature: _____

Certificate Number _____ Today's Date _____

Figure 3-39, Pyrotechnic Briefing Checklist

The following briefing issues must be discussed and deconflict with all pilots during the general safety brief. Each item need only be covered by one person. Any general item covered by the briefer need not be covered by the pyrotechnic shooter in charge (PSIC).

Item	Conducted by Briefer	Conducted by PSIC
EXACT DIMENSIONS AND LOCATION OF THE PYROTECHNICS AREA *	<input type="checkbox"/>	<input type="checkbox"/>
MAGNITUDE OF EXPLOSIVES BEING USED*	<input type="checkbox"/>	<input type="checkbox"/>
AIRCRAFT/PYRO DECONFLICTION PLAN*	<input type="checkbox"/>	<input type="checkbox"/>
PYRO CREW AND CRASH/FIRE/RESCUE POSITIONS	<input type="checkbox"/>	<input type="checkbox"/>
COMMUNICATIONS FREQUENCY AND PROCEDURE*		
PRINCIPAL	<input type="checkbox"/>	<input type="checkbox"/>
SECONDARY	<input type="checkbox"/>	<input type="checkbox"/>
DISCRETE	<input type="checkbox"/>	<input type="checkbox"/>
EMERGENCY PROCEDURES*		
FIRE	<input type="checkbox"/>	<input type="checkbox"/>
ACCIDENT/INJURY	<input type="checkbox"/>	<input type="checkbox"/>
PYRO SEQUENCE BY ACT*		
LOCATION	<input type="checkbox"/>	<input type="checkbox"/>
STRAFE DIRECTION(S)	<input type="checkbox"/>	<input type="checkbox"/>
BOMB DIRECTION(S)	<input type="checkbox"/>	<input type="checkbox"/>
ALTITUDE AND FLYBY LINES*	<input type="checkbox"/>	<input type="checkbox"/>
FORECAST WINDS AND EFFECTS ON PYRO*	<input type="checkbox"/>	<input type="checkbox"/>
FOD POTENTIAL AND EFFECTS	<input type="checkbox"/>	<input type="checkbox"/>
KIO (KNOCK IT OFF) PROCEDURES*	<input type="checkbox"/>	<input type="checkbox"/>

*NOTE: These items comply with, and are required by “Addition to AFI 11-246 V1, ACC Sup 1.”

Signatures: _____ Briefer _____ PSIC

Figure 3-40, Typical Air Race Site

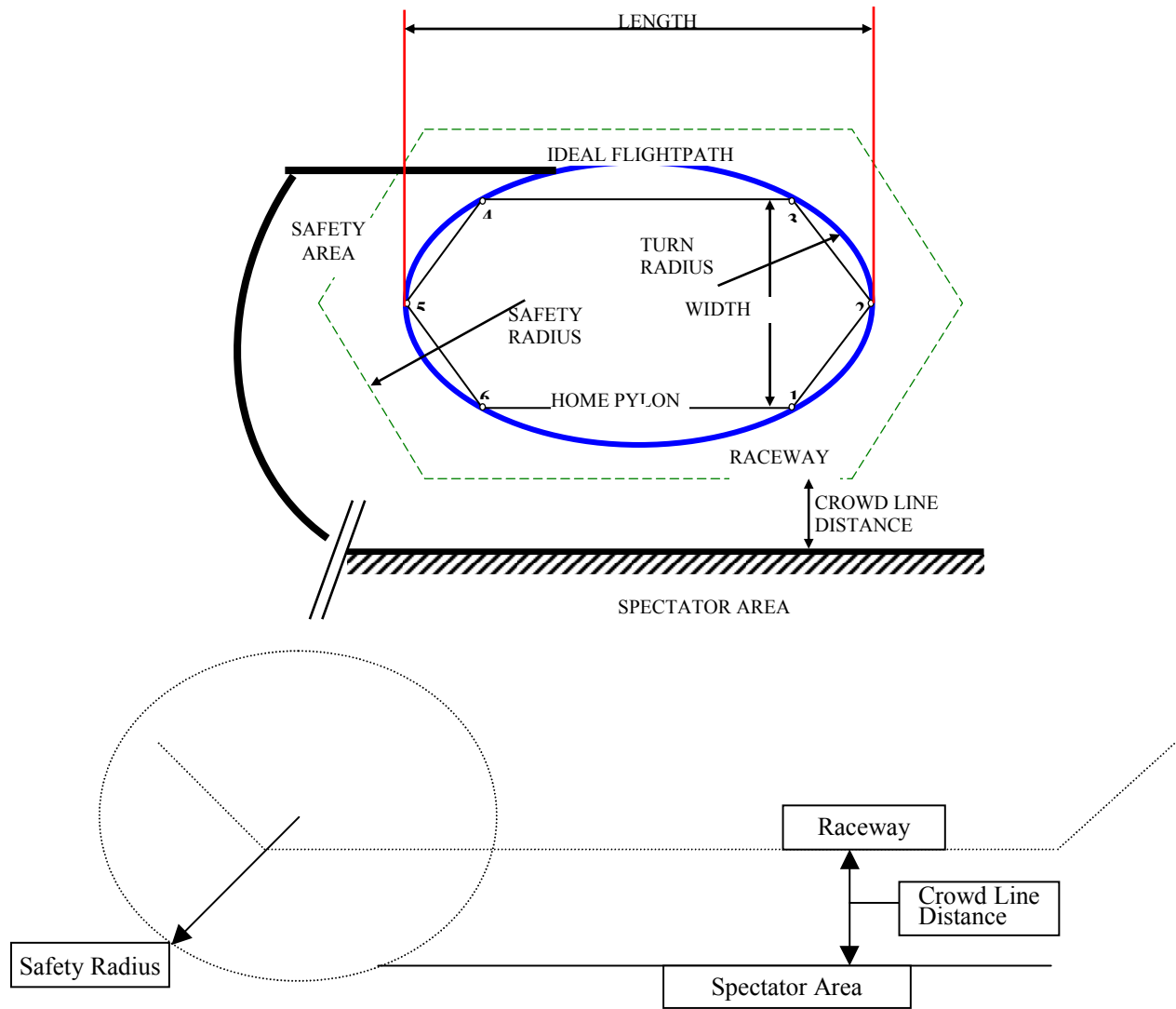


Figure 3-40A, Typical Unlimited Racecourse Site

Figure 3-54. Typical Unlimited Race Course Site

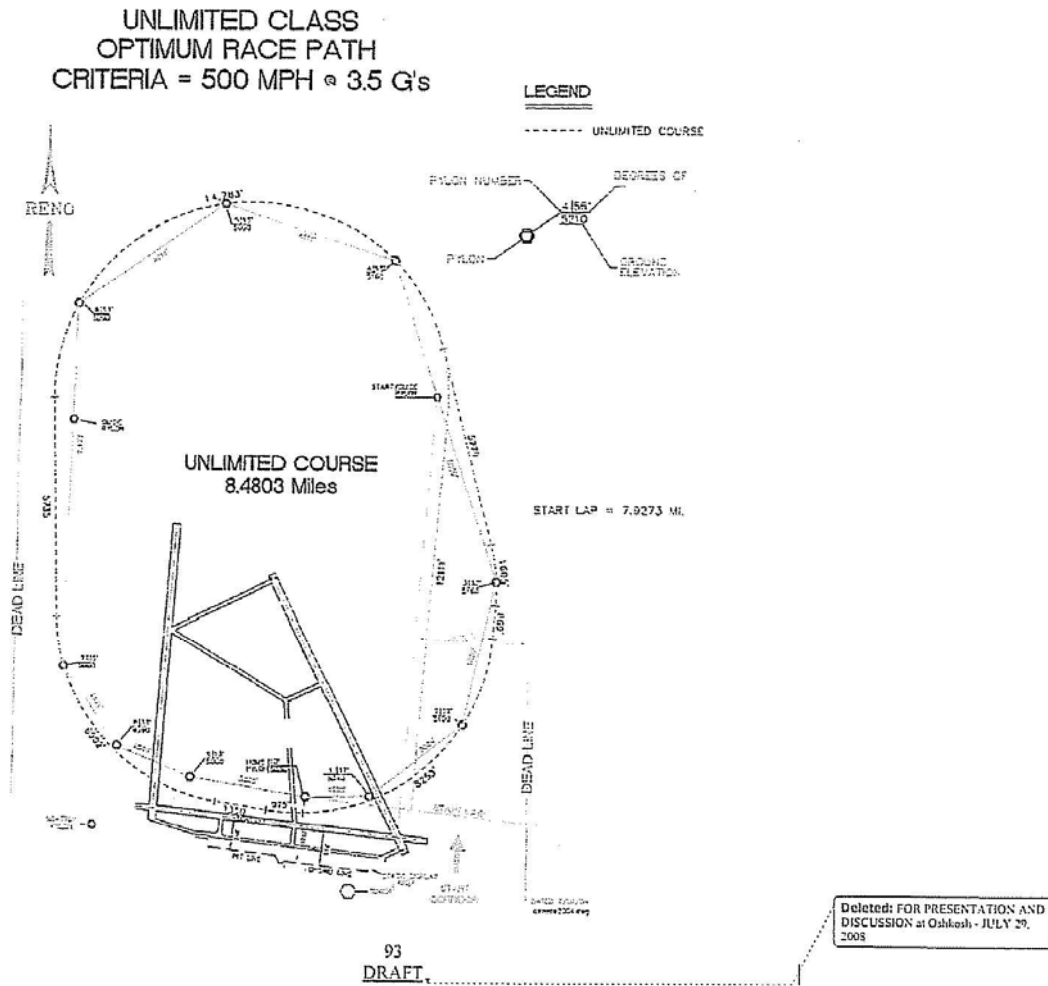
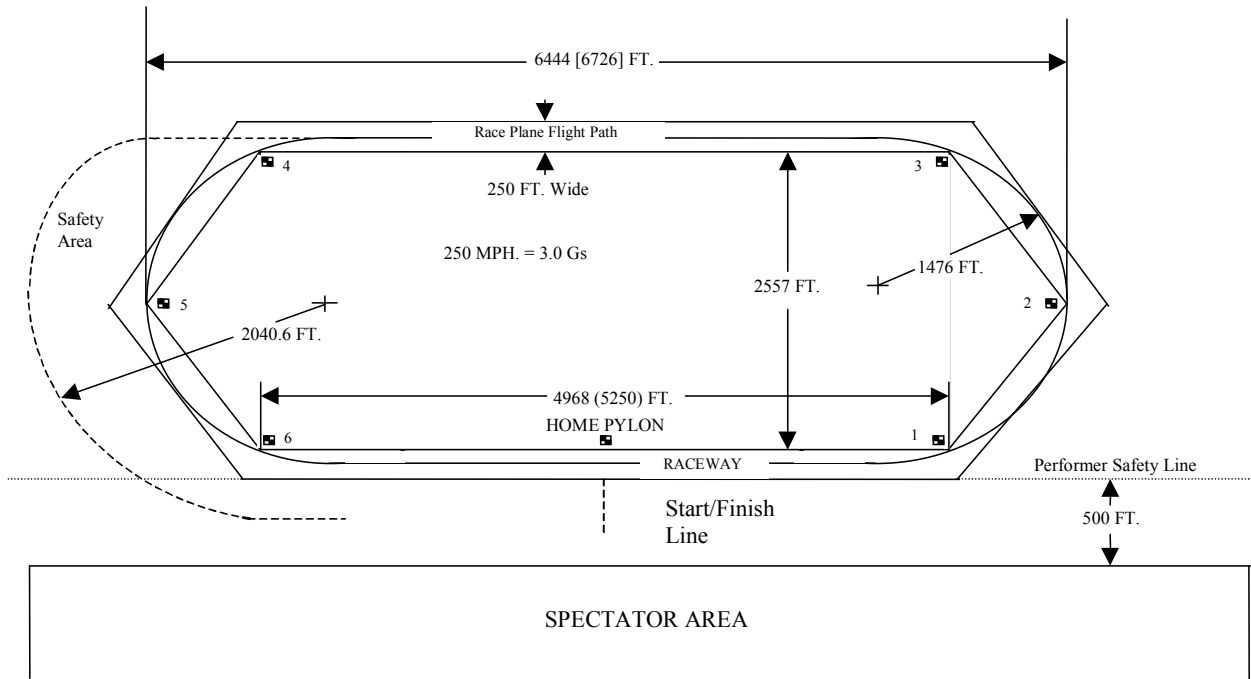


Figure 3-40B, Sample Racecourses

3.0 MILE [5.0 KM] FORMULA ONE AIR RACECOURSE



2.0 MILE FORMULA V AIR RACECOURSE

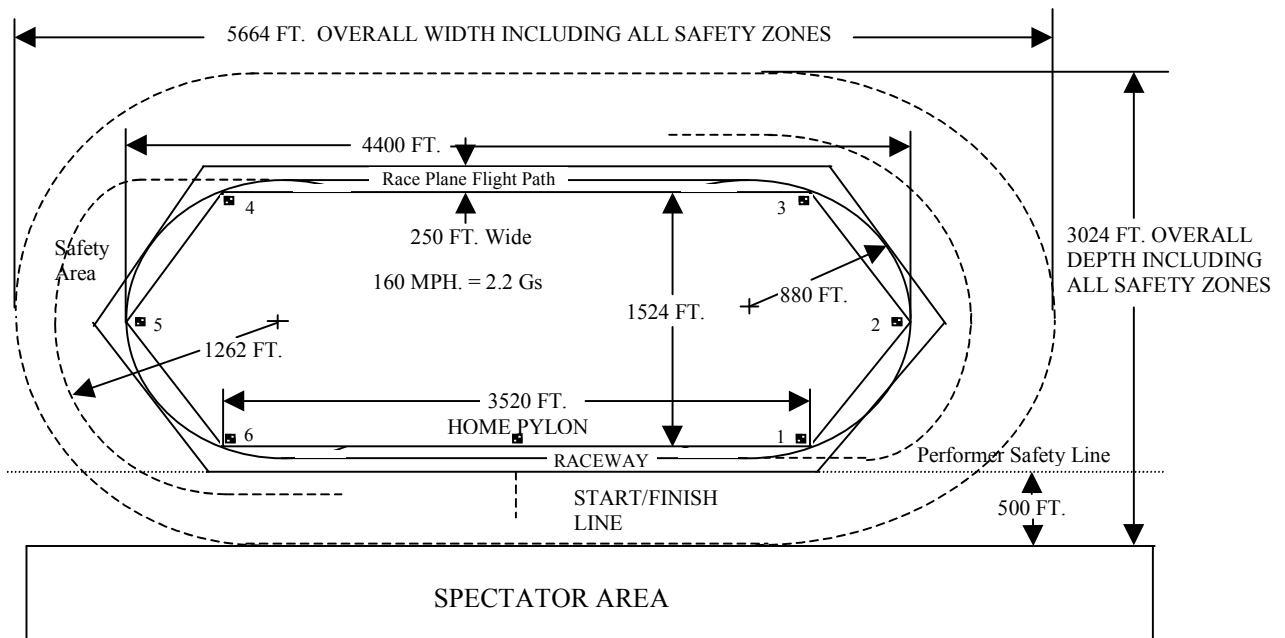


Figure 3-41, Example of a Balloon Competition Manual

BALLOON COMPETITION MANUAL

This manual has been prepared as part of the application for the issuance of a Certificate of Waiver with attachments and special provisions for a Manned Free Balloon Competition on [insert date]. [Insert event name] BALLOON RACE.

Table of Contents

- I. Purpose.
- II. Responsibilities and Procedures.
 - a) Duties of Personnel.
 - b) Registration and Airworthiness Determination.
 - c) Pilot and Event Flight Crewmembers.
 - d) Pilot/Crew Briefing Responsibilities.
 - e) Letter of Agreement.
 - f) Event Documentation.
- III. Ground Operations.
 - a) Clear Areas.
 - b) Spectator Areas.
 - c) Crowd Control Requirements.
 - d) Landowner Relations/Notification.
- IV. Flight Operations.
 - a) Areas of Operations.
 - b) Types of Operations.
 - c) Altitudes.
 - d) Weather Requirements.
 - e) Communications Requirements.
 - f) Air Traffic Coordination.

Section I. Purpose.

This manual is submitted as a part of an application for a waiver of Title 14 of the Code of Federal Regulations (14 CFR) part 91, §§ 91.119(b) and 91.119(c), by the [insert name of organization] for the [insert name of event] Balloon Race. Specifically, the waiver will allow officially registered balloons to operate at an altitude of no less than [insert number] feet above the highest obstacle within a [insert number]-foot radius of the balloon en route to the target within a [insert number] nautical mile (or other specified distance) radius of the designated launch field or goal. It will also allow for officially registered balloons to operate at [insert number] feet AGL over spectators and to set goals and/or targets at a minimum distance of [insert number] feet from physical barriers provided for spectator control.

No waiver is requested nor is a waiver required by 14 CFR for any mass ascensions or pilot choice launches.

Section II. Responsibilities and Procedures.

a) Duties of Personnel.

- 1) Event Director—[insert name].
- 2) Operations Director—[insert name].
- 3) FAA Liaison—[insert name].
- 4) Weather Officer—[insert name].
- 5) Safety Officer—[insert name].

b) Registration and Airworthiness Determination.

Balloons flown at the event must have current certificates of registration and airworthiness, or in place of the latter, an equivalent document from the Federal Aviation Administration. Chapter [insert number] of the competition rules cover procedures for balloons damaged or otherwise made unairworthy during the event. Throughout the event the Safety Officer or his designees; and appropriate FAA personnel will be consulted as necessary.

c) Pilot and Event Flight Crewmembers.

Each pilot must hold the appropriate pilot certificate (Private or Commercial) with Lighter-than-Air Category and Free Balloon Class Rating. Each pilot must show evidence of current Flight Review (14 CFR part 61, § 61.56) and must also show evidence of currency per § 61.57. Minimum hours as PIC per the organizers specified time must also be shown.

Event flight crewmembers carried on board a balloon during the event must have been briefed by the pilot of the balloon and must attend the pilot briefing for that flight. Each event flight crewmember must sign the waiver form supplied by the pilot. Each event flight crewmember must attest that they have attended the applicable pilot briefing(s) and have read and understand the conditions of the waiver. Only [insert number] event flight crewmember(s) may be carried in each balloon during the flight.

d) Pilot Crew Briefing Procedures.

All pilots are required to sign a statement indicating that they have read and understand the provisions of the waiver and the official [insert title] Competition Rules prior to any competitive flight.

Before each flight all pilots must attend the flight briefing. Chapter [insert number] of the competition rules provides details of all briefings.

e) Letter of Agreement.

Letter of agreement will be issued and signed as required for the specific type of event.

f) Event Documentation.

All relevant registration files, task data sheets, pilot registration information etc., will be maintained by the organizer at least [insert number] days after the event and will be made available to the FAA Monitor upon request. Competition maps and task sheets will be made available to the FAA Monitor at the time of the pilot briefing.

Section III. Ground Operations.

a) Clear Areas.

Clear areas are established at each target site. These areas are kept clear of spectators and are usually fenced. [Insert type of officials] will police any area (such as the target area on the main launch field) to keep unauthorized persons out. In the Minimum Altitude Diagram, this is referred to as the "Target Area."

b) Spectator Areas.

The primary competitive spectator area is located at the main launch site. Crowd control is initiated by physical barriers around the launch site and target areas controlled by [insert type of officials]. Official and balloon recovery vehicles are parked in restricted areas. Traffic is controlled by local police as required. Use of existing and temporary barriers secure spectators from the briefing area and headquarters and from potential low level flight areas surrounding goals/targets (see additional remarks under "ALTITUDES").

Competitive goals/targets set outside of the primary launch area in remote areas attract few, if any, spectators beyond those involved in race operations (officials and crews). Scoring/measuring officials control these areas as determined by conditions, and will isolate the area surrounding the goal/target from any unauthorized personnel.

c) Crowd Control Requirements.

Crowd control will be provided by [enter law enforcement agency name(s)] agencies and officials of the balloon event under the direction of the Safety Officer.

d) Landowner Relations/Notification.

Positive landowner relations are vital to the continuance of sanctioned events. There is an ongoing effort by all involved persons to maintain good landowner relations for the event. Additionally, as per Rule [enter number] pilots must obtain permission for launch from private property; and per Rule [enter number] minimize disturbing landowners. Landowners may request that their property be indicated on the competition map as a Prohibited Zone (PZ) as per Rule [enter number].

Section IV. Flight Operations.

a) Area of Operation.

The operations will occur in a [insert number] mile radius of the launch field located at [insert name] Airport as indicated on the official competition map (to be provided as requested). Final landings may occur beyond these boundaries, but no pilot choice takeoffs or mass ascensions will exceed these boundaries. Headquarters for the event operations will be located at the [insert name of location].

b) Types of Operations.

The event will consist of single and multiple tasks as called by the Director after consultation with other approved competition officials, as appropriate, considering the conditions at hand and forecast to develop during the anticipated flight times.

The tasks will include:

1) Pilot Declared Goal.

Each pilot will fly from a launch area and will attempt to drop a marker close to a goal selected by him/her. Pilots define goals by description and map reference. The goals are declared in writing and given to a timekeeper. Each pilot flies from the designated launch area and attempts to drop a marker close to the selected goal. The result is the distance from the declared goal to the observed mark. The shortest distance wins. The landing after dropping the marker cannot be less than 1,500 feet from the declared goal.

2) Judge Declared Goal.

Each pilot flies from the designated launch area and attempts to drop a marker as close as possible to a goal set by the officials. The result is the distance from the declared goal to the observed mark. The shortest distance wins. The landing after dropping the marker cannot be less than 1,500 feet from the declared goal.

3) Multiple Judge Declared Goal.

Each pilot flies from the launch area and chooses one of a number of goals set by the officials. The pilot attempts to drop a marker near the goal chosen. The result is the distance from the observed mark to the nearest goal. The shortest distance wins. The landing after dropping the marker cannot be less than 1,500 feet from the selected goal.

4) Hare and Hound.

A hare balloon will fly from the launch area and each pilot will attempt to fly near the final landing place of the hare and drop the marker. In the West, this may be referred to as the "Road Runner Race." The lead balloon, "the hare," takes off several minutes before the rest of the balloons and drops a marker at a designated point. The hare balloon deflates and is removed from the landing area. The marker dropped by the hare balloon becomes the target for the later

balloons, “the hounds.” The hounds try to drop markers as close as possible to the hare balloon’s target. After dropping the marker from the hound balloon, landing is at the pilot’s discretion but cannot be less than 1,500 feet from the target.

5) Fly In Task.

Pilots find their own launch areas and attempt to reach a set goal or target.

6) Fly On Task.

A task where a pilot declares a goal to which he flies, after dropping his marker in another task.

7) Gordon Bennett Memorial.

The competitors will maneuver their balloons a prescribed distance from a target on the ground (scoring area). They will then attempt to maneuver back to the scoring area and drop markers on the target.

8) Max Distance—Minimum Distance.

Pilots will attempt to drop their markers in the Scoring Area a maximum or minimum distance from the launch point as specified on the task sheet.

9) Elbow (ELBO).

Each pilot flies from the launch area and attempts to achieve the greatest change of flight direction during the flight with the least angle of divergence. A 180-degree change in direction with a zero angle of divergence is best. Two concentric circles, specific distances apart, surround the launch point. The pilot drops two markers. The first marker must be dropped between the inner and outer circle. The second marker must be dropped within the outer circle. The second marker cannot be less than 5,000 feet from the first marker. Landing after dropping the marker is at the pilot’s discretion.

10) Convergent Navigational Task (CNT)

Officials establish a goal, but pilots find their own launch areas for the attempt to reach the goal. The boundary of the launch area declared by the pilot is the physical boundary of a field or a circle with a 300-foot radius from the inflation point, whichever is less. The officials place a target at the goal 30 minutes before the launch period. The pilot launches from a selected site, attempts to navigate to the target, and drops a marker. The result is the distance from the target to the marker. The shortest distance wins. The landing after dropping the marker is at the pilot’s discretion but cannot be less than 1,500 feet from the target.

11) Watership Down

This is a two-part task. Pilots find their own launch sites and fly to a target established by the officials. At a specified time before the launch, a hare balloon takes off adjacent to the target and drops a marker at a designated point. This marker becomes the second target. The hare balloon

deflates, and the envelope remains flattened on the ground to serve as a guide to the second target area. Each competing pilot drops a marker as close as possible to the first target, which was the launch site of the hare balloon. Pilots then fly-on to drop a second marker as close as possible to the target marker placed by the hare balloon.

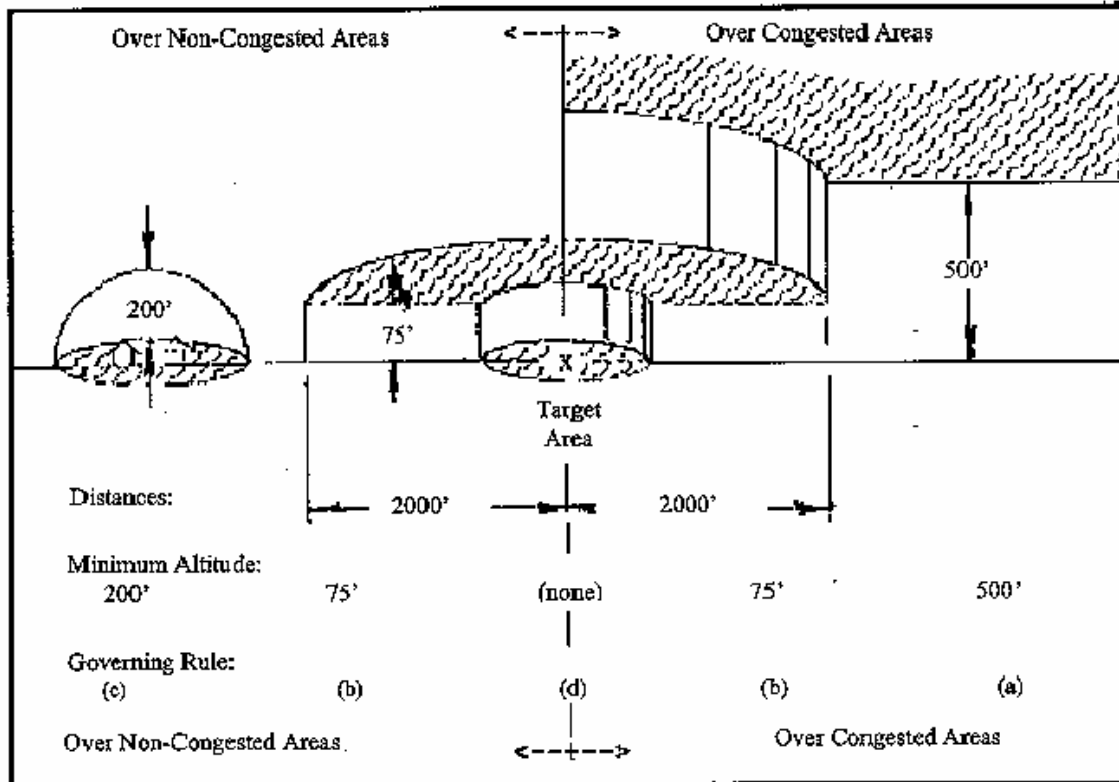
12) Key Grab.

This event usually has a target (generally a tall pole with the keys to a new automobile affixed to the top) in a centralized location. The balloonist must depart a predetermined distance from the target. The object is to maneuver the balloons, one by one, over the target so the pilot can attempt to grab the keys as the balloon goes by the pole.

The area around the pole must be completely clear of spectators and under the control of the event officials. Event organizers should have portable bull horns or a public address system to control the crowd movements or to direct the balloonist away from the target area in an emergency. If these precautions are observed, a waiver of § 91.119(c) can be issued to allow operations closer than 500 feet to the crowd.

The event organizer must establish procedures to ensure that the balloonists will abort the key grab attempt if it becomes apparent that the balloons' ground tracks will not be within the operating area or when a realistic chance for the key is no longer possible. The landing areas must be segregated from the spectators; only bona fide recovery crews should be present in the landing area to assist the balloonist with recovery. All participants must be briefed before the operations.

c) Minimum Altitude Diagram.



d) Altitudes.

The waiver provides that registered balloons will be allowed to make approaches to targets and/or goals within the designated areas. Balloons making these approaches will be permitted to fly over the designated spectator areas at an altitude of not less than [insert number] feet AGL. The balloons must have attained a state of altitude equilibrium at this [insert number]-foot minimum altitude and not be descending while passing over designated spectator areas. It is felt that this altitude is sufficient to allow for unusual circumstances with an adequate margin of safety for spectators.

In order to provide the highest possible level of safety for spectators, the scoring officials will cause scoring/measuring officials to be positioned among the spectators to allow crowds to be shifted as necessary and to provide warning regarding any markers that may be dropped in the spectator areas. Announcements over the public address systems will also advise the spectators of the possibilities of both low flying balloons over the area and of markers being dropped in this area.

e) Weather Requirements.

Flight operations will be conducted during the period from published sunrise to sunset, with the visual flight rules (VFR) and weather conditions as specified in § 91.155. Maximum demonstrated surface winds must be [insert number] or less.

The decision for flight is the sole responsibility of the pilot and the decision of whether to hold a task is the sole responsibility of the director after consultation with appropriate safety officials.

f) Communications Requirements.

Primarily by required pilot briefing, however, supplementary information is also given on local radio stations and on the public address system. Most pilots carry either FM, CB, or aircraft radios, and some communication is possible by radio.

g) Air Traffic Coordination.

A NOTAM will be requested from the [insert name] FSS advising air traffic of numerous balloons in the [insert name] area at varying altitudes from [insert date] through [insert date] during the three hours immediately after sunrise and three hours prior to sunset.

This Operations Manual includes the information and requirements contained in the following attachments.

ATTACHMENTS:

Sectional of Area

List of Pilot Entries

Schedule of Events

Statement of Responsibility

Competition Rules

Figure 3-41A, Preshow Briefing Guide

AVIATION EVENT PRESHOW BRIEFING GUIDE

WHO SHOULD ATTEND:

ALL PERFORMERS:

- Air show Pilots
- Tow/Jump Aircraft Pilots
- Skydivers
- Military Flight Demo Pilots
- Air and Ground Pyrotechnic Technicians
- Jet Vehicle Drivers
- Narrator(s)
- Remotely Deployed Aircraft Pilots (via telecon)
- At least one (1) representative pilot for each military team

KEY OPS/SUPPORT PERSONNEL:

- Air Boss
- Air Traffic Control
- Fire Chief/CRS
- EMS Helicopter
- Smoke Oil/Refueling Chief
- Aircraft Marshalls Chief
- Maintenance Chief
- Crowd Control Chief
- FAA (or assigned) MONITOR:

WEATHER BRIEFER:

AIR SHOW DIRECTOR/EVENT SPONSOR:

(Including that person named on the waiver as being “responsible to ensure safety of the event”)

WHO SHOULD NOT ATTEND:

- Pets
- Individual Sponsors
- Media Representatives
- Spouses
- Children
- Relatives/Friends

Anyone not directly associated with the performance

BRIEFING:

ROLLCALL: Those not attending the briefing MAY NOT participate in this performance!

INTRODUCE KEY OFFICIALS:

TIME HACK:

CURRENT WEATHER AND FORECAST: (Include regional and national weather by quadrants on the last day, for departing aircraft)

REVIEW NOTAM(S)/TFR:

REVIEW WAIVER AND SPECIAL PROVISIONS:

REVIEW AREA MAP:

- Hold Points/Turn Directions Altitudes
- Noise Abatement Procedures
- Sensitive Areas
- Special Use Airspace
- Remote Recovery Airports
- Obstructions
- Controlled/Emergency Bail Out/Ditching Procedures

AIRPORT STATUS:

- Airspace
- Runways In Use
- Facilities
- Arresting Cables
- Traffic Patterns

AIR SHOW LAYOUT:

- Sequence of acts and their cues for positioning
- Show Lines
- Spectator Areas (Primary/Secondary)
- Ground Based Pyro
- Hazards
- Aircraft Parking
- Taxi Routes
- Crash Rescue Runway Watch Locations
- Unique Local Items/Conditions

Figure 3-42, Circling the Jumpers Briefing

NOTE: An endorsement of “Circling the Jumpers” on FAA Form 8710-7 is no longer required for the circling aircraft pilots.

In the event that a performance involves aircraft operating in the vicinity of parachutists, whether in free-fall or under deployed canopies, all pilots and the jump master or team leader of the parachutists involved shall be present at the air show briefing. The air boss or responsible person shall ensure that each participant understands the details of the performance which shall include, at the minimum, the following information:

- a) The number of jumpers performing,
- b) The types of and/or colors of parachutes,
- c) The exit altitude and deployment altitude,
- d) The planned flight path prior to exit, as well as, the descent area of the jump aircraft,
- e) The number, make(s)/model(s) and color of the aircraft involved, and
- f) Procedures to be used in the event of an unexpected occurrence.

If at any time the air boss determines that the circling the jumpers is not proceeding as briefed, the air boss must give a “Knock It OFF” to the circling aircraft. Upon receiving a “Knock It Off” the circling aircraft will make a cautious turn away from the jumpers and go to the previously determined holding area and wait for instructions from the air boss.

RESERVED. Paragraphs 3-163 through 3-180.