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SURVIVAL FACTORS / OPERATIONS

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Attachment 2 – FAA Advisory Circular (AC) 91-45C

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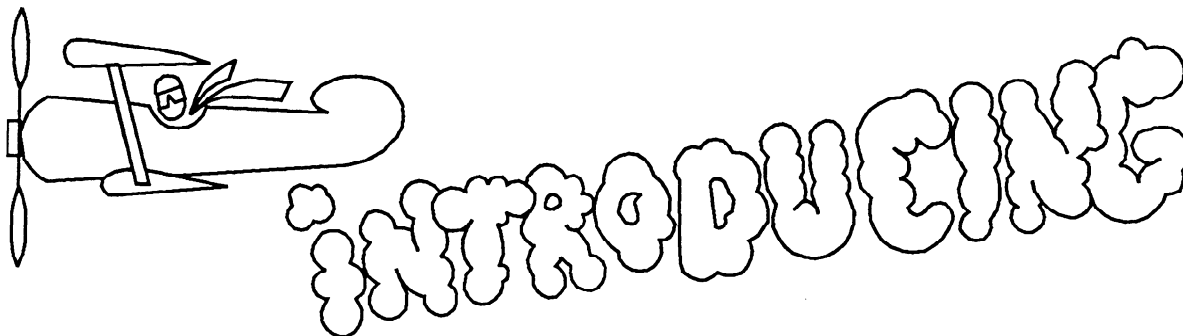


U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

AC 91-45C

DATE 2/1/90



WAIVERS:
AVIATION EVENTS



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Subject: WAIVERS: AVIATION EVENTS

Date: 2/1/90
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1. PURPOSE. This Advisory Circular (AC) provides prospective aviation event sponsors and other interested parties with information necessary to assist in planning and conducting a safe aviation event. In addition, it provides information on the application process for a Certificate of Waiver or Authorization.

2. CANCELLATION. AC 91-45B, Waivers - Airshows/Contests/Races, dated August 5, 1981, is cancelled.

3. RELATED FAR SECTIONS. Parts 61, 91, 103, and 105.

4. FORMS AND REPORTS. Samples of the following forms are provided in Appendix 1.

a. FAA Form 7711-2, Application for Certificate of Waiver or Authorization. This form can be obtained from the local FAA Flight Standards District Office (FSDO).

b. FAA Form 7711-1, Certificate of Waiver or Authorization, will be issued by the FAA FSDO upon approval of FAA Form 7711-2.

5. BACKGROUND. Numerous waivers are issued each year by the Federal Aviation Administration (FAA) for the purpose of aviation events or aerial demonstrations. These waivers are issued based on the FAA policy that anytime the agency determines a proposed event will be in the public interest in terms of safety and environmental concerns, a waiver will be issued predicated on specific requirements of the event. Regardless of the purposes for which an aviation event is sponsored, events or show sites judged unsafe shall not be accepted for waiver or author-

ization consideration. Based on the foregoing, this AC is intended to explain many of the requirements necessary when considering the show site, facilities, the level of competence of participants, waivers and/or authorizations required, and other items of concern to the prospective aviation event sponsor.

6. DEFINITIONS. Many terms used in this AC are unique to aerial demonstration/aviation events; therefore, the following definitions shall enhance the understanding of their application:

a. *Aerobatic Flight.* The FAA has determined that for purposes of an aviation event, an aerobatic maneuver means an intentional maneuver in which the aircraft is in sustained inverted flight or is rolled from upright to inverted or from inverted to upright position. All standard aviation event aerobatic maneuvers such as slow rolls, snap rolls, loops, Immelmans, cuban eights, spins, hammerhead turns, etc., may not be performed over congested areas or over spectators. Steep banked, level, climbing, or descending turns necessary during maneuvering between aerobatics are not considered to be aviation event aerobatic maneuvers. Normal positioning turns for high performance aircraft operated by the military regardless of angle or bank or pitch attitude, are not considered to be aviation event aerobatic maneuvers. Normal maneuvers, such as steep turns, involved in air racing are not considered aerobatic.

b. *Aviation Events* include airshows, air races, aerobatic contests, parachute demonstration jumps, practice areas designated for aerobatic proficiency or training, and balloon meets and races. Most events are held at or immediately

adjacent to an airport. An increasing number, however, are held offshore (within gliding distance of land), over water, in the vicinity of a state fairground, or at other off-airport locations. Aerobatic school activities or aerobatic meets may occur which are not aviation events, contests, or races, even though a waiver must be issued. At these school activities or meets that are not advertised as aviation events, it may not be necessary to provide public aviation event policing and emergency facilities.

c. **Certificate of Waiver or Authorization.** FAA Form 7711-1, Certificate of Waiver or Authorization, is issued after proper application and approval, for the purpose of providing **TEMPORARY RELIEF** from certain designated Federal Aviation Regulations (FAR).

d. **Control Point.** A specified location where the show sponsor, a designated representative, or safety director manages the aviation event. The communications capability necessary to control the aviation event must also be located at this site.

e. **Crowd Line.** A physical barrier or a line marked on the ground which, with added policing, serves as a restraining line. The crowd line is placed at a specified distance from the showline. The barrier must prevent spectators or other nonparticipants from encroaching upon the showline.

f. **Inspector-in-Charge.** The FAA inspector-in-charge is an individual who conducts the feasibility study (if needed), participates in the preseason evaluation meeting, evaluates the application for waiver or authorization, recommends issuance or denial, and who conducts the surveillance of the aviation event.

g. **Markers** used in balloon competition tasks for dropping or marking targets are small flour bags, with a maximum weight of 3 ounces and a fabric tail 4 inches wide and 6 feet long. The international standard for markers is 100 grams maximum weight, with a tail 10 cm wide

and 2 meters long. Markers made to this specification should not injure persons or damage property.

h. **The Primary Spectator Area** is the main area provided by the sponsor for spectator use. This is the area where the public can generally be expected to view the airshow.

i. **The Secondary Spectator Area** may be any other area where persons have a natural tendency to gather to observe the event. This is generally an area opposite the showline from the primary spectator area or a road, etc. Secondary Spectator Areas should be agreed upon by the show sponsor and the FAA inspector-in-charge before the aviation event begins. These are areas where it is usually not possible to eliminate the presence of people.

j. **Show Center** is a reference point along the showline denoting the center of the operating area.

k. **A Showline** is a prominent, readily-visible ground reference such as a river, runway, taxiway, canal, breakwater, road, or any straight line that enhances pilot orientation during aerobatic routines (Appendix 1, Figure 1). The showline also serves as the horizontal axis for the show. Snow fences spread flat on the ground may also make acceptable references depending on the visual contrast. Lines of parked buses, cars, or boats, although less desirable, may be the only alternatives when natural showlines are not available.

l. **A Show Season** generally runs from April through October of a given year. Geographical and climatological circumstances can lengthen or shorten the show season.

m. **A Waiver** is an official document issued by the FAA which authorizes certain operations of aircraft in deviation from a regulation, but under conditions ensuring an equivalent level of safety.

7. DISCUSSION.

a. **Scope of Waivers.** Waivers vary insofar as the rules that are requested to be waived. Some events require nothing more than waiving FAR § 91.71(d) to permit aerobatic flight at less than 1,500 feet above the surface. Others may require waiving aircraft speed limitations, minimum safe altitudes, or limitations while operating in the vicinity of airports or even within a Terminal Control Area (TCA).

b. **A request for a waiver of the basic Visual Flight Rules weather minimums** specified in FAR § 91.105 shall be considered only --

(1) *In areas where the entire event can be conducted with Air Traffic providing separation between participating aircraft and nonparticipating aircraft, and*

(2) *When provisions are made to advise participants of uncontrolled aircraft that may present a hazard. This does not imply that Air Traffic assumes the responsibility for providing separation of performing aircraft.*

c. **Regulations Affected.** A sponsor should consider factors that directly affect the rules to be waived. These include show site, type of aircraft maneuvers to be performed, etc. Sections of the FAR that should be waived for some other events in certain locations or that are more complex are:

(1) FAR § 91.70, Aircraft speed.

(2) FAR § 91.79(b) and (c), Minimum safe altitude.

(3) FAR § 91.85, Operating on or in the vicinity of an airport.

(4) FAR § 91.87, Operations at airports with operating control towers.

(5) FAR § 91.89, Operations at airports without operating control towers.

(6) FAR § 91.90, Terminal control areas.

d. **Regulations that May or May Not Be Waived.** FAR § 91.79(a) **SHALL NOT BE WAIVED FOR AERIAL DEMONSTRATION PURPOSES.** FAR §§ 91.79 (b) and (c) may be waived only when the following conditions are met.

(1) *A waiver of the requirements of FAR §§ 91.79(b) and (c) is issued for aerial demonstrations by the U.S. Air Force "Thunderbirds," the U.S. Navy "Blue Angels," tactical aircraft demonstrations approved by the appropriate military command, and the Canadian "Snowbirds." These performers or teams have Command-approved maneuver packages that are submitted to and approved by the FAA. These maneuver packages describe normal routines that do not call for aviation event aerobatic maneuvers over congested areas, over persons, or over the primary or secondary spectator areas.*

(2) *A waiver may be issued to performers, other than those covered in the preceding paragraph, to transition a congested area at less than the minimum altitudes described in FAR §§ 91.79(b) and (c) in nonaerobatic flight. The ingress and egress to the aerobatic/fly-by area must be in compliance with the following:*

(i) *Aerobatic demonstration --*

(A) *During ingress (Appendix 1, Figure 2) to the aerobatic area from flight above a congested area, the pilots are expected to leave the altitude being flown as described above so that a smooth transition may be made to the performance altitude in the aerobatic area. Steep approaches may be made; however, in no case shall the descent angle to the aerobatic area be less than that required for a normal approach for a landing for the aircraft involved.*

(B) *During egress (Appendix 1, Figure 3) from the aerobatic area for flight above a congested area, the pilots are expected to climb*

at a rate consistent with a safe operation or the best angle of climb pitch attitude for the aircraft involved. If prolonged flight over a congested area is required, the climb shall be continued to at least 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft. During the positioning turns above the congested area, there shall be no aviation event aerobatic maneuvers performed.

(ii) *Fly-by Demonstrations --*

(A) *During ingress* (Appendix 1, Figure 2) to the fly-by area from flight over a congested area, pilots are expected to leave the altitude flown above the congested area so that a smooth transition may be made to the fly-by altitude in the fly-by area. Steep approaches may be made; however, in no case shall the descent angle to the fly-by area be less than that required for a normal approach for a landing for the aircraft involved.

(B) *During egress* (Appendix 1, Figure 3) from the fly-by area for flight over a congested area, the pilots are expected to climb at a rate consistent with a safe operation or the best angle of climb pitch attitude for the aircraft involved. If prolonged flight is to be conducted above a congested area, the climb shall be continued to at least 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet from the aircraft. During positioning turns above a congested area there shall be no aviation event aerobatic maneuvers performed. The showline for fly-by demonstrations shall not be closer than 500 feet to the primary or secondary spectator areas.

e. *Performers must determine, at each show site*, that geographical/atmospheric conditions allow performance within the limitations of their aircraft. If there are obstructions or atmospheric conditions, such as density altitude, which do not allow a safe transition over a congested area or back into the performance area, the operation may be allowed if the performers raise the altitude of the aerobatic or fly-by maneuver so that the ingress and egress over the congested area can be safely accomplished.

f. *Ultralight Vehicle Operations.*

(1) *Any ultralight that meets the applicability* of FAR § 103.1 may be operated as an ultralight vehicle in accordance with FAR Part 103 or the operator may elect to certificate the vehicle and operate under applicable aircraft regulations. It is important to remember that an ultralight vehicle that has been certificated as an aircraft and no longer operated under FAR Part 103 must meet the same requirements as a conventional aircraft. This includes aircraft operational limitations, pilot certification, and statement of aerobatic competency.

(2) *Aerobatic flight demonstrations by ultralight vehicles* shall be included on an FAA Form 7711-1, with appropriate special conditions, only when a statement of determination that the vehicle and the operator are able to conduct the proposed demonstration without creating a hazard to persons and property on the surface has been submitted with the application. The statement should contain a summary of how the determination was made.

(3) *Regardless of the category (aircraft/ultralight vehicle)*, aerobatic demonstrations by ultralights must meet the separation standards for aviation event performances that are applica-

ble to conventional aircraft with a level flight cruise speed that is less than 156 knots using 75 percent power.


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CHAPTER 1. GENERAL

1. WHO MAY SPONSOR AN AVIATION EVENT? Anyone, either an individual or an organization, who wishes to sponsor an aviation event may do so as long as the proper forms and supporting documentation are submitted to the FAA and subsequently approved.

2. SPONSOR EXPERIENCE. The experienced sponsor of an aviation event is generally well acquainted with the requirements and procedures for obtaining the necessary waiver. However, in some instances, individuals or organizations attempting to sponsor an event for the first time are not aware that an FAA Form 7711-1, Certificate of Waiver or Authorization, is required. For an inexperienced sponsor, the local FAA Flight Standards District Office (FSDO) can provide valuable information and assistance.

3. INDUSTRY ASSISTANCE. Additional guidance from industry representatives may be obtained by contacting the International Council of Air Shows (ICAS), P.O. Box 1105, 1910 Horton Road, Jackson, Michigan 49204, (517) 782-2424. This organization, comprised of aviation event sponsors and performers from all over the world, can provide valuable assistance. Also, numerous independent clubs and associations formed by airshow performers, such as the Professional Airshow Performers Association (PAPA), can provide the same type of information. In addition, there are several commercial aviation event groups that offer a wide variety of services ranging from assisting and staging, to contracting an entire aviation event. Many of these clubs, associations, and commercial groups are affiliated with the Experimental Aircraft Association (EAA), Wittman Airfield, Oshkosh, Wisconsin 54903. Further information may be obtained by contacting the EAA at (414) 426-4800.

4. SPONSOR PLANNING. Thorough planning has a direct bearing on the success and safety of any event. Therefore, it is in every-

one's best interest that an effective plan for all facets of the event be developed.

a. **Preshow Planning.** The following items should be discussed with the FAA FSDO before beginning preparation of FAA Form 7711-2, Application for Certificate of Waiver or Authorization.

(1) *Type of Event* (aerobatics, balloon race, parachute demonstration, etc.).

(2) *Status of Performers* (military versus civilian).

(3) *Site Selection.*

(i) Airport sites.

(ii) Fairgrounds.

(iii) Other sites.

(iv) Planned crowd control.

(4) *Policing of the safety zone.*

(5) *Communications.*

(6) *Emergency equipment and personnel.*

(i) Physician.

(ii) Ambulance.

(iii) Firetruck.

(iv) Crash wagon.

(v) Other.

(7) *Normal airport traffic.*

(8) *Vehicular traffic problems.*

b. *Post-event Planning.* Most successful sponsors dedicate considerable time and effort planning for the conclusion of the aviation event. They do this because they understand that all the effort expended producing a successful show could be ruined in the chaos that follows the termination of the event. With the disappearance of crowd control personnel, sponsors have learned that the more spectators kept at the show site for a period of 30 to 40 minutes after the main attraction, the safer it will be for everyone. Some examples of ways to keep spectators at the show site are:

(1) *Have the demonstration pilots remain* after the show to talk with the spectators and sign autographs.

(2) *Conduct* a raffle or drawing and give away the prizes after the show ends.

(3) *The demonstration aircraft* can be put on display at the end of the show so that the remaining spectators can get a closer look at both aircraft and performer.

5.-10. RESERVED.

CHAPTER 2. PREPARATION FOR AN AVIATION EVENT

SECTION 1. PREAPPLICATION PREPARATION

11. DETERMINING WHICH SECTIONS OF THE FAR NEED TO BE WAIVED. The sections of the FAR that will need to be waived depend largely on the types of operations to be conducted at the aviation event. In an effort to determine which sections of the FAR need to be waived, the sponsor should ask himself or herself certain questions.

a. *Questions that should be asked are:*

(1) What sort of routines will be staged?

(2) Will there be demonstrations by small, slow-speed aircraft only or will high performance aircraft be involved?

(3) Will military demonstration teams participate?

(4) Will a parachute demonstration be staged?

(5) Will the event include hot air balloon ascensions?

b. *The answers to these questions* and other areas unique to each aviation event will help the sponsor in determining which FAR need to be waived.

12. SITE SELECTION.

a. *Selection of a site for an aviation event* is of the utmost importance. If the selected site does not permit the minimum separation distances discussed in paragraph 15, FAA Form 7711-2, Application for Certificate of Waiver or Authorization, shall not be approved. It is important that the selection accommodate all the specific types of aerial demonstrations, without derogating safety

or creating a hazard to any nonparticipant or spectator. In addition, it is imperative that all areas adjacent to the show site containing homes, factories, major highways, well-traveled thoroughfares, or any occupied vessel, vehicle, or structure, be carefully evaluated before making a final decision for site selection.

(1) *Airports.* An airport environment is probably best suited for aerial demonstrations/aviation events. If the local airport environment provides the necessary separation distances, it should be given first consideration as a probable site since demonstration pilots prefer a runway within gliding distance of the demonstration area.

(i) The spectator area should be clearly defined. Frontage of the spectator area might range from 1,500 feet to 3,000 feet. It is not recommended that the spectator area frontage be greater than 3,000 feet. This is to allow proper run-in and exit corridors for participating aircraft.

(ii) Depth of the spectator area is determined by required display areas, paved surfaces, and other considerations which are peculiar to each facility. The important point is to define the frontage and sides of the spectator area, making them compatible with planned aerial demonstrations.

(2) *Fairground Sites.* In some instances, fairgrounds are selected as sites in lieu of attempting to stage an event at a less than ideal airport site. These sites offer certain advantages not normally found at an airport. The grounds are generally well fenced, usually making crowd control a simple task. Also, frequently, grandstands or bleachers, concession stand areas, well-marked first-aid stations, police, and some-

times a fairground fire department are readily established. In addition, the typical fairground is better able to cope with the vehicular traffic generated by an event than the typical airport that may have only one or two access roads.

(3) *Other Sites.* A lake or other open area bordering the edge of a town or at a park where an open area could be found may provide a desirable site for certain aerial demonstrations. In any case, the area over which the aerobatic demonstrations are to be conducted must be void of vehicles, persons, or inhabited structures.

b. *Airport Coordination.* Most of the support functions necessary to accommodate and service aircraft are located at airports. In addition, the (normally) vast expanse of open area found at airports is conducive to better spectator visibility and comfort. Pilots also prefer operating from an airport environment because it provides direct access to runways and open areas for any emergency requiring an immediate landing. Every aviation event will require the closing of the selected facility for some period of time. This may range from a short time on the weekend to long periods on the days before the event and during the actual show days. Do not forget that certain portions of the facility may need to be closed to accommodate physical setup and preparation for the event. The impact of all this must be considered as a part of the early site evaluation.

c. *Air Traffic Control.* Naturally, if the airport is served by a control tower, radio communications will be handled by the Air Traffic facility. Care must be taken to ensure that radio communications or prearranged ground-to-air signals are established with each performer as a preface to the conduct of the actual event. Even if every aircraft is equipped with two-way radio, a ground-to-air recall signal must also be provided to the performers. If the airport is served by a scheduled air carrier, arrangements must be made for the arrival and departure of such aircraft. Generally, it is adequate to schedule a break in

the activities to allow for scheduled arrivals and departures.

d. *If there is not 1,000 feet* between the primary and the secondary spectator areas, the location will not be considered for an aviation event waiver.

e. *If the site cannot provide a 500-foot distance* from the showline to the spectators, the location will not be considered for an aviation event waiver.

13. SUPPORTING DATA. For most events, supporting data must address the following major concerns:

a. *Where the public attends the event,* it is necessary that adequate "spectator areas" be provided to isolate spectators from:

(1) Flight areas.

(2) Active runways.

(3) Runup areas.

(4) Other active areas such as emergency or police helipads, parachute landing areas, etc.

b. *Methods that will be used* to ensure areas outside of the designated spectator area will also be secure.

c. *Maps, charts, diagrams, or other data* appropriate to the activities and locations should be submitted with the application. For an aviation event, an appropriate 7.5 series Topographic Quadrangle Map, published by the U.S. Geological Survey (Scale 1:24,000), for the proposed area should be submitted. Additional aerial photographs depicting the entire site and ranging out from the show center to a radius of from 1/2 to 2 1/2 miles, depending upon the type of event planned, may also be submitted. Appropriate showlines, safety zones, spectator areas, control

centers, location of emergency facilities, etc., should accompany FAA Form 7711-2.

14. SELECTION OF PERFORMERS. Before the FAA approves any pilot to perform low-level aerobatics in close proximity to spectators or other persons on the surface, that pilot's competency to safely perform individual routines must be verified. Except for pilots assigned to official military teams, each pilot must be properly certificated and rated for the aircraft to be flown. In addition, each pilot must possess a current FAA Form 8710-7, Statement of Aerobatic Competency, signed by an FAA inspector (Appendix 1, Figure 4).

a. *If a demonstration pilot does not hold* an FAA Form 8710-7, the FAA will require a satisfactory demonstration of the aerobatic routine. When this has been accomplished, an FAA Form 8710-7 will be issued and the airman will be allowed to participate under the terms and conditions of the waiver. Early application for FAA Form 8710-7 is encouraged because of the critical time constraints just before an aviation event. The responsibility for obtaining the Statement of Acrobatic Competency lies with the airman, not the aviation event sponsor.

b. *Nonairmen participants*, such as parachutists, can be accepted on the basis of a license issued by the United States Parachute Association (USPA) or similar license. Further guidance on parachutists and parachuting can be found in Chapter 6.

c. *The FAA does not require certification or licensing* of operators of ultralight vehicles, wing-walkers, ribbon cut personnel, and drivers of vehicles for a car-to-plane transfer.

d. *In order to avoid a possible cancellation* of a performer or a delay of the aviation event, verification that all scheduled participants are properly qualified and/or certificated by the FAA and, where appropriate, by other FAA recognized groups or organizations should be made.

e. *Further guidance on military teams* can be found in Chapter 3.

f. *If an air race is part of the aviation event*, guidance for an air race course design can be found in Chapter 4.

g. *Further guidance on balloon meets and balloon competitions* can be found in Chapter 5.

15. ESTABLISHING THE SHOWLINES.

a. *The establishment of the showlines* as the first order of business is preferable to establishing the crowd line and then determining the showlines.

b. *In order to enhance safety*, the showline may be moved toward or away from the spectator area to give the performer a more identifiable reference. However, the showline should not be moved from specified distances.

c. *The 500-foot showline* represents the minimum horizontal distance that is authorized under FAR § 91.79(c). The 500-foot showline is NEVER waived with regard to any spectator area. Routines that involve several aircraft in formation or nonaerobatic fly-bys must ensure that the nearest aircraft to the spectator area does not operate closer than 500 feet. This may require that the showline be more than 500 feet from the spectator area.

d. *The showline is used as a reference* by the performer or, in the case of formation flight, by the formation's leader. It is of paramount importance that showlines provide guidance to the performers during their routines. In the case of aircraft formations, performers must adjust to the showline to ensure that the critical aircraft is not closer than 500 feet from a spectator area. If the takeoff runway is closer than 500 feet from the primary or secondary spectator areas, no aerobatics may be permitted until the aircraft has passed the end of the spectator area and then only if there is no congested area or spectators under the

performing aircraft. Under the same conditions, an aerobatic maneuver may be performed after takeoff following a turn away from spectator areas.

e. *Pilots performing flight demonstrations* must maintain the following minimum showline distances from the spectator areas. These distances are predicated on 75 percent power in straight and level flight for piston aircraft. For turbine aircraft, the distances are based on demonstrated normal cruise speed. Showline categories, speeds, and distances are shown in Table 1.

f. *As described in the table below*, three different showlines might be required when all three categories of aircraft are participating at a show site. Because all show sites do not have prominent surface lines for use as showlines that are located exactly 500, 1,000, or 1,500 feet from spectator areas, it may not be possible to move the spectator area to arrive at these distances. The optimum situation is when prominent showlines are 500, 1,000, or 1,500 feet from spectator areas as appropriate to the aircraft being operated

at the show. These distances from the showline to the spectators for each category of aircraft are desirable, however, there are other considerations. There shall be no waiver of the 500-foot showline for Category III aircraft. For a show site where a runway is located less than that prescribed from an area that provides for the safety of the spectators, it is desirable to use the runway as the showline rather than a poorly marked line at the 1,000- or 1,500-foot mark. The safety of the performance and that of the spectators is enhanced by the participants using a well-defined showline. This is not to say that the spectator areas should be enlarged so that the optimum prescribed distances are not available. Again, for the safety of the performers and the spectators, the showline may be moved in or out to avoid antennas, windsocks, tree lines, etc. The showline, however, may not be closer than the minimums specified in the following paragraphs.

(1) *Category I Showline*. The optimum showline distance from spectator areas for Category I aircraft shall be 1,500 feet or greater (Appendix 1, Figure 5). If the only well-defined showline is closer than 1,500 feet to a spectator area and it is not possible to move the spectator

Table 1. Showline Categories, Speeds, and Distances

CATEGORY	CRUISE SPEED	SHOWLINE DISTANCE FROM SPECTATOR AREA
I	More than 245 knots (282 MPH)	1,500 feet
II	More than 156 knots Less than 245 knots (181 to 282 MPH)	1,000 feet
	Aerobatic Helicopters	1,000 feet
III	Less than 156 knots (180 MPH)	500 feet
	Aerobatic Gliders (Sailplanes)	500 feet
	Nonaerobatic Aircraft	500 feet

area so that it is 1,500 feet from the showline, the showline may be approved down to AN **ABSOLUTE MINIMUM DISTANCE OF 1,200 FEET**. When there is a reduction in the distance from the showline to the primary spectator area, a similar reduction **SHALL NOT BE PERMITTED** on the secondary spectator area side of the showline (Appendix 1, Figures 6 and 7). For example, if the showline is 1,300 feet from the primary spectator area, there must remain 1,500 feet from the showline to the secondary spectator area. **IN NO CASE SHALL THERE BE LESS THAN 2,700 FEET BETWEEN THE PRIMARY AND THE SECONDARY SPECTATOR AREAS.**

(2) *Category II Showline.* The optimum showline distance from spectator areas for Category II aircraft shall be 1,000 feet. If the only well-defined showline is closer to a spectator area than 1,000 feet, and it is not possible to move the spectator area so that it is 1,000 feet from the showline, it may be approved down to AN **ABSOLUTE MINIMUM DISTANCE OF 800 FEET** (Appendix 1, Figure 8). When there is a reduction in the distance from the showline to the primary spectator area, a similar reduction **SHALL NOT BE PERMITTED** on the secondary spectator side. For example: If the showline is 800 feet from the primary spectator area, there must remain 1,000 feet from the showline to the secondary spectator area. **IN NO CASE SHALL THERE BE LESS THAN 1,000 FEET BETWEEN THE PRIMARY AND THE SECONDARY SPECTATOR AREAS.**

(3) *Category III Showline.* The showline **SHALL NOT** be closer than 500 feet from the primary or secondary spectator areas (Appendix 1, Figure 9).

g. *The 500-foot showline* may also be used for Category I or II aircraft being flown nonaerobically and parallel to the primary and/or secondary spectator area.

h. *An arc directed away from the crowd,* i.e., "Pass in Review" maneuver, may be flown provided the aircraft remain at least 500 feet from the primary and/or the secondary spectator area.

i. *Takeoff and Landing Areas.*

(1) *When the takeoff runway is closer than 500 feet from the primary or secondary spectator areas,* no aerobatics are permitted until the aircraft passes the end of the spectator area and then only if there is no congested area or spectators under the aircraft that is performing aerobatics (Appendix 1, Figure 10).

(2) *When the takeoff runway is less than 500 feet from the spectators,* an aerobatic maneuver may be performed after takeoff following a turn away from spectator areas (Appendix 1, Figure 11).

(3) *Spectator areas may not be located closer than 500 feet from any takeoff and landing runway or area when the normal landing speed of any aircraft exceeds 100 knots* (Appendix 1, Figure 12).

(4) *The "flying farmer" or similar routines that involve excessive maneuvering immediately after take-off or just before landing must also be separated from the spectator area by at least 500 feet* (Appendix 1, Figure 12).

(5) *If the entire airshow involves aircraft with landing speeds less than 100 knots and there is not excessive maneuvering during takeoff or landing, spectators may be located as close as 200 feet from the takeoff or landing areas* (Appendix 1, Figure 13).

j. *Engine Run Areas.* Areas where engines, propellers, or rotors will be turning must be at least 100 feet from the spectator area unless they are protected by a barrier that prevents entry by unauthorized personnel.

k. **Rotorcraft Takeoff and Landing Areas.** During some aviation events there may be helicopters taking "VIP's" for rides or serving as emergency vehicles. The landing and takeoff areas used by these aircraft should be enclosed in a manner that prevents unauthorized persons from entering the helipad. The helipads should be located so the aircraft does not pass over spectators during takeoff or landing. Regardless of the emergency or nature of the operation, spectators must not be endangered.

1. **Sailplane Operations.** Airshow aerobatic demonstrations with sailplanes are becoming more numerous around the country. Sailplanes, by their very nature, are less hazardous than powered aircraft. Sailplanes do not have engines and propellers, nor do they carry flammable liquids that could cause injury to spectators. For these reasons, the following criteria apply **ONLY TO SAILPLANE OPERATIONS.**

(1) *Sailplanes fall into the Category III group.* Category III showline and performance distances apply.

(2) *Because of the sailplane's need for a tow* by either an airplane or a car, taxiways are often used for takeoff. This is advantageous in many cases since it allows the tow plane, towline, and the sailplane to be positioned without congesting the active runway or affecting the operation of powered aircraft. Unless there are obstructions that would make a taxiway takeoff unsafe, it should be permitted with a minimum distance from the primary spectator area of 200 feet (Appendix 1, Figure 14). This distance may be reduced to 150 feet when the takeoff path, beginning at or near the center of the spectator area, is at an angle of at least 10° away from spectators (Appendix 1, Figure 15).

(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

spectators, landing on the taxiway shall not be permitted.

(4) *This part does not apply* to motorgliders which are treated as powered aircraft.

16. **POLICING.** There is no specific requirement for the use of uniformed police or security guards. The need for special policing depends upon several factors.

a. *If fencing is used for crowd control,* there may be little need for special crowd-control personnel. On the other hand, if the sponsor intends merely to cordon off the primary or secondary spectator areas with rope, it might be necessary to have special crowd-control personnel.

b. *With respect to crowd control,* remember that it is the sponsor's--NOT the FAA's responsibility--to ensure that all reasonable efforts are made to confine spectators to the primary and secondary spectator areas. If reasonable efforts have been taken and unauthorized persons or vehicles enter the area where aviation event aerobatic maneuvers are performed, efforts must be made to remove them from the area. Good judgment should be used when determining whether it is necessary to halt a show to protect persons on the ground.

c. *One policing need that is often ignored* is the airspace where aviation event aerobatic maneuvers are performed overlaps roads or highways. This can present a problem unless arrangements are made to control traffic. If a road runs beneath the operating area and that road is not patrolled, motorists could park on the shoulders to enjoy the show. If this condition exists, arrangements should be made to have the traffic controlled. Transition over a road or highway underlying the operating area is the same as egress or ingress over congested areas. There is no requirement for termination of an aviation event aerobatic maneuver at a given distance from a road or highway, but, as with a congested area, aviation event aerobatic maneuvers may not

be performed over roads or highways unless the road or highway has been closed and no persons are allowed to park along the road or highway.

d. *If there are farmhouses or other buildings* below the airspace where aviation event aerobatic maneuvers are performed, a reasonable effort to evacuate such buildings during the aviation event should be made. If persons re-enter the buildings, every effort should be made to evacuate them again.

17. EMERGENCY FACILITIES. Generally, the FAA shall not require much more in terms of emergency facilities than are normally found at airports. Off-airport sites can be another matter, and, before selecting such a site, serious consideration should be given to emergency facilities at such sites. Every aviation event sponsor is encouraged to provide emergency medical service even though this service is not normally necessary. Many sponsors prefer to have the local fire department's emergency rescue squad, paramedics, or emergency medical technicians at their show rather than a physician. Normally, the following rules of thumb are adequate:

a. *Physician.* Except for events that are a great distance (in a ground vehicle) from a hospital or medical clinic, an emergency rescue squad, paramedics, emergency medical technicians, or a first-aid station can be substituted for a physician.

b. *Ambulance.* If an emergency rescue squad is provided, an ambulance should also be provided. If there is a physician in attendance, any vehicle acceptable to the physician for emergency transportation is sufficient. Many communities rely on a sheriff's or local law enforcement officer's vehicle as their only means of ambulance service. It would be improper to prohibit use of a similar vehicle to serve as an ambulance for the event.

c. *Firetruck.* For the most part, the only reason for having a firetruck at an aviation event is for performers' benefit, not the spectators'. If

the performers are willing to accept a pickup truck with handheld fire extinguishers, the FAA does not demand a sponsor provide an official firetruck with trained firemen.

d. *Crash Wagon.* Many locations where events are conducted do not have crash wagons available. If they are not available, the FAA does not require a sponsor to obtain one from a facility that might be hundreds of miles away. Again, the presence of crash wagons benefits the performers, not the public.

e. *Aerobatic school activities or aerobatic meets,* which are not aviation events, contests, or races, require a waiver. At these school activities or meets not advertised as aviation events, it may not be necessary for the school or sponsor to provide policing or emergency facilities.

f. *Some professional performers do not accept a contract* or an invitation unless liability insurance has been obtained and/or adequate first aid and emergency medical transportation are provided. Also, performers might demand that, for their own protection, a firetruck with trained personnel be provided.

18. FAA FORM 7711-2. FAA Form 7711-2, Application for Certificate of Waiver or Authorization (Appendix 1, Figure 16), is used when applying for FAA Form 7711-1, Certificate of Waiver or Authorization (Appendix 1, Figure 17).

a. *The local FAA FSDO assists* in the preparation of FAA Form 7711-2; however, the preparation and submission of FAA Form 7711-2, as well as all of the necessary supporting documentation, are the responsibility of the applicant.

b. *Depending on the type of aviation event or operation,* all items on the form may not be applicable. In other cases, additional information may be required.

c. *An application for an aviation event* must be submitted at least 45 days before the date of the scheduled event.

d. *An application for a parachute jump* must be submitted at least 4 days before the scheduled event.

e. *Upon receipt*, the FAA FSDO reviews the application for accuracy. Because the information submitted on FAA Form 7711-2 CANNOT be altered by the FAA FSDO, the FAA inspector-in-charge will arrange a meeting in order to correct the application.

f. *Upon approval by the FAA FSDO*, FAA Form 7711-2 becomes a part of FAA Form 7711-1 (Appendix 1, Figure 17).

19. SCHEDULE OF EVENTS. The FAA must see a schedule of events in order to evaluate the application. The schedule of events does not

need to be detailed. However, it should contain at least a general description of the types of events (e.g., aircraft aerobatic performances, sky-divers, car/plane transfer, etc.), the identification of the aircraft, and the performers in the sequence of their appearance.

a. *A date must be specified* when a schedule of events will be provided.

b. *Any demonstrations added* to the "Schedule of Events" require FAA approval. Any additions should be submitted to the FAA for consideration at the earliest opportunity. Cancellation of events does not require advance notice to the FAA. However, press shows or other flight activity occurring outside the approved dates and times are not considered additions. A revised or new waiver application will be required.

20.-24. RESERVED.

SECTION 2. MANAGING THE AVIATION EVENT

25. PRESHOW ACTIVITY.

a. *Schedules and priorities* have a tendency to get hectic before the start of even a properly planned event, e.g., performers asking when and where the briefing is to take place, fire department personnel trying to find out where their trucks and ambulances are to be stationed, concession stand operators looking for electrical outlets, etc. If sufficient, responsible personnel have not been assigned to handle each aspect of the numerous functions associated with a successful event, last-minute problems can appear.

b. *Preshow Briefing.* One thing that is required of all waivers for aerial demonstrations is the preshow briefing of all performers. For performing teams, it is permissible for just the team leader or other performing member to attend in lieu of every member. The team leader or other performing member must then assume the responsibility for briefing each of the other members of the team. It is imperative that the briefing cover every aspect of the event. The following list of subjects shall be covered at every briefing:

- (1) Weather brief.
 - (i) Who gives the briefing, i.e., sponsor, Flight Service Station specialist, etc.
 - (ii) Source of information.
 - (iii) If forecasts are involved, the valid time of forecasts.
- (2) Runway in use.
- (3) Taxi instructions.
- (4) Performer aircraft parking.
- (5) Aviation event radio communication frequencies.

- (6) Emergency procedures.
- (7) Showlines.
- (8) Area avoidance.
- (9) Review of provisions on the FAA waiver.
- (10) Review of the schedule.
- (11) Aircraft departure plan.
- (12) Next briefing (if necessary).
- (13) Questions.
- (14) Credential check and signing area.
- (15) ALL participants sign waiver.
- (16) Fueling procedures.

c. *Departure from Other Airports.* At an airport location where a performing or fly-by aircraft will depart from a location other than the airshow site, a telephone briefing must be conducted with the pilots of those aircraft.

d. *Nonairport Location Briefing.* If the event is to be conducted at a nonairport location, special procedures for the briefing of the performers must be established. The performers must be informed well in advance of the briefing date, time, location, and if appropriate, directions to where the briefing will take place. In addition to the subjects listed in paragraph 25b, the briefing should cover any subjects unique to the aviation event location (e.g., desert terrain, mountainous area, site near water, etc.).

26. AVIATION EVENT PERSONNEL.

a. *The actual number of individuals* assigned to air and ground operations duties will vary dependent upon the size of the event. It may range from 3 or 4 people at a small aviation event to 50 or more at a large aviation event. It is important that all tasks be addressed and that no individual is so burdened that safety is compromised.

b. *The aviation event director or a designated representative* is responsible for all aspects of presenting the aviation event. It is his or her duty to set policy and monitor the conduct of the aviation event.

c. *An independent safety observer* should be assigned by and report directly to the aviation event director. An independent safety observer should use a checklist to monitor all air and ground operations activities throughout the aviation event. During the aviation event, the independent safety observer should immediately report any unsafe situation to the aviation event director.

d. *It may be appropriate to have an assistant operations director* to divide tasks. However, it is important that the final authority for air and ground operations authority be with one individual and not several who are working on numerous, independent tasks.

e. *A primary responsibility* of the air and ground operations director is to complete early and ongoing communication with the airport manager, FAA FSDO, and Air Traffic Control representatives. These individuals and representatives must be aware of aviation event activities and be kept informed.

f. *Air and ground operations coordinators* are responsible for accomplishment of all aspects of the specific area to which they are assigned. The following is a list of coordinators recommended by the International Council of Air Shows (ICAS):

(1) Act coordinator.

- (2) Display aircraft coordinator.
- (3) Maintenance support coordinator.
- (4) Housing/Transportation coordinator.
- (5) Special event coordinator.
- (6) Military teams coordinator.
- (7) Fly-in coordinator.
- (8) Aircraft security coordinator.
- (9) Operations assistants.

g. *Operations assistants* are individuals assigned to the various coordinators as necessary. For example, four assistants might be assigned to help park aircraft, or they may be a person specifically assigned to operate a radio in the tower.

h. *All tasks of the air and ground operations staff* might be accomplished by 1 or 2 people until approximately 30 days before the event. However, as the aviation event date approaches, the coordination and implementation of tasks is beyond the capability of one or two people. The appropriate number of staff coordinators should be identified and assigned early. This helps to prevent crisis management in the final days before and during the event weekend.

i. *Written records should be required of all coordinators.* These might consist of memos, records of phone calls, completed forms, records of meetings, checklists, and critiques. The idea is to have a clear and verifiable means to determine that all tasks have been completed and to create accurate records which may be used in future planning.

j. *An air and ground operations checklist* is a good tool to guide the staff through its various essential tasks. It should be adjusted to fit the specific event and built upon from year to year.

k. *Administration is the management of all available resources.* The management of all available resources is best conducted through effective communication and recordkeeping, both internally and externally to other departments. Each person on the air and ground operations team is responsible in some way for the administrative process.

27. FLYING PARTICIPANTS.

a. *Each participant* should have operational information pertinent to the scheduled aviation event before arriving at the site. It is recommended that a copy of the completed FAA Form 7711-2, including diagrams, maps, charts, photos, etc., be forwarded to participants at the same time the application is submitted to the FAA. It is recommended that participants be made aware of aircraft servicing procedures, where and when the aviation event briefing will take place, the time and location of any airworthiness inspections, and any additional information which will help participants be informed before their arrival. The idea is to impart as much operational information as practical in advance so that participants are not deluged at the last min-

ute with operational procedures and instructions on top of an already packed schedule of activities.

b. *Aircraft rides for hire and media flights* are two unique flight operations which frequently must be addressed by aviation event organizers. Permission to conduct aircraft rides for hire is based upon the same criteria that is applied to any other participant. Thorough planning and thought should also be given to the times rides are allowed, the ingress/egress safety of passengers, and positive security control of the entire aircraft-ride ground operation.

c. *Qualified aviation event participants* have a keen interest in the conduct of a safe operation. The primary safety check-and-balance used by the aviation event organizer is the establishment of the credentials of each participant and his or her aircraft, confirmation of the participants' experience in an aviation event environment, and provision to each flying participant with the proper information regarding operations at that specific event.

28.-30. RESERVED.

CHAPTER 3. MILITARY DEMONSTRATION TEAMS

31. SCOPE AND CONTENTS. The guidelines in this chapter apply to military aircraft, military pilots, and parachute teams specifically designated to perform missions for the Department of Defense (DOD).

32. APPROVED PROFILES. All performances shall be in accordance with a planned profile approved by the applicable command. The various military teams shall provide the FAA with approved maneuver packages. Send to:

FAA
General Aviation Staff, AFS-20
800 Independence Ave., SW
Washington, D.C. 20591

33. DOD SANCTIONED TEAMS. The aerial demonstration teams sanctioned by the DOD are the U.S. Air Force "Thunderbirds" and the U.S. Navy "Blue Angels."

34. OTHER MILITARY TEAMS NOT SANCTIONED BY DOD. Other military teams who frequently perform at public events are the Army and Navy Service Academy Teams. Operations by the academy teams are maintained by their respective academy staff. The requirements for a performance by a DOD nonsanctioned team shall be the same as those for a civilian team.

35. MILITARY PARACHUTE TEAMS. One DOD-sanctioned military parachute team is the U.S. Army Golden Knights. The Golden Knights have two demonstration teams as well as competition teams (e.g., the Black Team and the Gold Team). Therefore, more than one unit operating under the designated team name could be jumping at two different locations. The U. S. Navy "Leap Frogs" are also a DOD-sanctioned parachute team.

a. *The military team determines* site acceptability, effect of wind conditions, and location of exiting the aircraft. This includes the decision

to exit over a congested area and the determination of authorized passengers during performances. DOD accepts the responsibility for these technical judgments with respect to the safety of the jump exhibition.

b. *An FAA Form 7711-2* must be submitted to the FAA FSDO having jurisdiction over the area in which the jump will occur. The application must contain a statement that the military command or service has determined that adequate safety margins exist at the demonstration site for the scheduled demonstration by the specific team on a specific date.

c. *Other military jump teams*, such as the U.S. Navy's "Chuting Stars," are not DOD-sanctioned. They may be allowed to perform the same jumps as civilians with a USPA Class C or D license. Determination of site acceptability, wind conditions, and location of exit from the aircraft (including exit over congested areas) shall be made by the team leader. DOD accepts the responsibility for these technical judgments with respect to safety. An FAA Form 7711-2 shall be submitted to the FAA FSDO having jurisdiction over the jump area.

36. TEAM QUALIFICATIONS AND TRAINING. The proficiency and ability of the members of military units are determined by the military command. Therefore, members of military demonstration teams should not be questioned about their competency to perform their approved routines.

37. MILITARY PARTICIPATION. DOD requires that a DOD Form 2535, Request for Military Aviation Participation, be completed for all military aircraft events not conducted on a military installation. To obtain a copy of DOD Form 2535, contact the nearest local military installation. DOD Form 2535 must be completed by the event sponsor or a designated representative. The sponsor or representative must forward

DOD Form 2535 to the appropriate FAA FSDO for the completion of the feasibility determination. DOD requires that any event requiring a waiver of the FAR must have the proposed site classified as either "satisfactory" or "unsatisfactory" during a feasibility study of the site conducted by an FAA inspector. A "satisfactory" classification indicates that following compliance with requirements, a waiver can be issued. An "unsatisfactory" classification indicates that the site is not approved for the requested military operations portion of the aviation event. If the site is marked "unsatisfactory" by the FAA, the request is not accepted by DOD.

38. SPECIALIZED TEAMS. The armed forces also sanction specialized teams which demonstrate the capabilities of one particular aircraft, e.g., the U.S. Air Force F-16 Tactical Demonstration Team. These specialized teams also develop maneuver packages which define the aerobatic routine to be performed at aviation events. A list of pilots authorized to conduct the aerobatic routines may be obtained from the FAA FSDO. Only designated aircraft and pilots may perform at aviation events in which FAR § 91.71 is waived. Demonstrations by these specialized teams must have command approval. If the local national guard group wants to perform aerobatics at an aviation event, a maneuvers package, approved by its command, must be submitted for review and approval well in advance of the performance.

39. ARRIVAL DEMONSTRATIONS. Military aerial demonstration teams may wish to put on an arrival show when they fly into the site of a scheduled aviation event. This normally consists of several passes for visual familiarity with existing landmarks and the practice of maneuvers using these landmarks. If a waiver is required for the arrival demonstration, the details should be worked out during the meeting with the FAA FSDO inspector-in-charge. The FAA will approve the arrival show provided it can be safely accomplished.

a. *If the arrival show means aerobatic operations over populated areas*, the show shall not be authorized. A good rule of thumb for determining whether or not an arrival show will be approved is, "Will everything necessary for the event itself be taken care of except crowd control and emergency facilities?" If the answer to this question is NO, then an arrival show can only consist of normal flight operations conducted within the FAR.

b. *The military often asks to have the team "advance man" accept the arrival show briefing* and relay all necessary information to the team. If the advance man is a rated aviator serving with the team, this should be allowed. Briefings with the team leader, or a representative, must be completed before the team's arrival at the local show site.

40. FOREIGN MILITARY TEAMS. The considerations and procedures of this chapter also apply to military teams sanctioned by other countries.

41. DOD FEASIBILITY STUDY. Before a DOD-sanctioned aerial demonstration team or parachute team accepts an invitation to participate at an aviation event, DOD requires that the FAA conduct a feasibility study to determine whether or not the proposed operation can be conducted.

a. *Sponsor Responsibilities.* It is the responsibility of the event sponsor to obtain and to submit DOD Form 2535 to the FAA.

b. *Conducting a Feasibility Study.* The feasibility study is normally conducted during the late summer months for an aviation event that will take place the following show season. Normally, an on-site inspection is required, as a minimum, to determine the status of new construction or other environmental changes in the area.

c. *Inspector Requirements.* If the inspector believes that the 7.5 series Topographic Quad-

range Map for the area is necessary to conduct the feasibility study, the inspector will request the map from the sponsor of the event. This may be necessary at a site where the U.S. Navy "Blue Angels" or the U.S. Air Force "Thunderbirds" are appearing for the first time or at sites where new construction may affect a location's suitability for an aviation event.

42. SPECIAL WAIVER PROVISIONS. While the FAA has emphasized the need to maintain standard aviation event separation requirements at sites where it can be accomplished, the aerial demonstration teams may request and receive a special waiver of FAR §§ 91.79(b) and (c) for nonaerobatic flight at altitudes of 200 feet above the highest obstacle within a 3 nautical mile distance from the designated show center along the approved ingress/egress route to and from the aerobatic maneuvering area. The request for the special waiver by the Commanding Officer of the military team should be approved provided:

a. *An on-site survey of the demonstration area* has been completed by the Commanding Officer of the military demonstration team or a designated member of the team.

b. *A meeting with the Commanding Officer* or a designated member of the team, the waiver applicant or designated representative, and the appropriate representative of the FAA FSDO has been held to discuss the potential impact of the operation on the surrounding area.

c. *A letter requesting a special waiver* of FAR §§ 91.79(b) and (c), minimum safe altitudes, from the Commanding Officer or the designated member of the team is provided to the FAA FSDO. The letter should specify the altitudes and area over which the special waiver is required. The letter should also state that the Commanding Officer or the designated member of the team, as an authorized representative of the DOD, has completed an on-site survey of the

proposed area of operation, has discussed the impact of the operation with the event waiver applicant and the appropriate FAA FSDO representative, and that the demonstration, as provided to the FAA in the command maneuvers package, can be safely conducted in the area. It should further state that the Commanding Officer will accept full responsibility for the operation.

d. *DOD has agreed* to approve official demonstration events only when safety is not derogated. Under no circumstances will flight at altitudes less than 500 feet above ground level (AGL) be conducted over designated spectator areas nor shall aviation event aerobatic maneuvers be conducted over spectator or congested areas.

e. *While the guidelines in this chapter* are primarily oriented to U.S. military precision flight demonstration teams, the procedures may also be applicable to foreign teams. A Letter of Authorization for lower than standard minimums for foreign military teams shall be issued by AFS-20, and only under special circumstances.

f. *Any questions* a sponsor may have involving a team should be directed to:

U.S. Army Parachute Team Operations Officer
Box 70126
Ft. Bragg, NC 28307-0126
(919) 396-2036

U.S. Navy Blue Angels
Events Coordinator
NAS Pensacola, FL 32508
(904) 452-2585

U.S. Air Force Thunderbirds
Air Show Coordinator
P.O. Box 9733
Nellis AFB, NV 89191
(702) 652-9593

43.-48. RESERVED.

CHAPTER 4. AIR RACE COURSE DESIGN

49. SPONSOR RESPONSIBILITIES. The sponsor has the responsibility to lay out the course in such a manner so as to prevent hazards to spectators and other persons on the surface.

50. PERSONNEL. Only persons and vehicles authorized by the race organization at the event should be permitted beyond the crowd line during racing operations.

a. *Authorized persons* include press, crews, and officials at the start line.

b. *Authorized persons should clear the runway* and move back to at least the runway "hold short" line 1 minute before launch for standing starts. No one should be permitted in front of the front row of aircraft after this time except the starter flag team.

c. *Pylon crews* (except the home pylon flag crews), press, and vehicles should remain inside the pylon course during races. Race timing teams are permitted in the area between the crowd line and the showline during racing.

51. TYPICAL RACE COURSES. A diagram of a typical air race site is shown in Appendix 1, Figure 18. A map of a typical unlimited race course (Reno, NV) is shown in Appendix 1, Figure 19. Four examples of suitable air race site diagrams are shown in Appendix 1, Figure -20. The method of determining the various distances used are discussed in the following paragraphs.

52. RACE COURSE DESIGN. Closed-course pylon air racing is conducted over a fixed, short-distance race course, usually located on or adjacent to an airport. The design of a satisfactory pylon air race course involves the shape of the course itself and the relationship of that course to the spectator areas. Both of these depend upon the maximum speed that may be expected from the racing aircraft and the maximum "g" loading

(acceleration forces) that the race aircraft are expected to encounter when flying the race course in a normal manner. Additionally, the maximum height at which race aircraft are expected to fly during the race becomes a factor.

53. RACE COURSE SPEEDS. The following speeds are typical speeds for each racing class.

a. *Formula Vee:* 160 miles per hour.

b. *Sport Biplane:* 210 miles per hour.

c. *AT-6/SNJ:* 225 miles per hour.

d. *International Formula One:* 250 miles per hour.

e. *Unlimited:* 450 miles per hour.

f. *When additional classes become active,* they should be added to this list with appropriate speeds specified.

g. *The maximum "g" loading* for a race aircraft flying the course in a normal manner has been set at 3.5 "g's." Note that in actual racing, where maneuvering and turbulence are encountered, momentary "g" loadings in excess of this figure can be expected.

h. *The speed and "g" loadings* permit the calculation of the minimum radius turn that should be permitted in the design of the race course. The formula for the turn radius for a given "g" loading and speed is: (Using a value of 3.5 for "g," the minimum turn radius is shown for each racing class in Appendix 1, Figure 21.)

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

R = Minimum turn radius
V = Aircraft speed (ft/sec)

$$\begin{aligned} G &= \text{Max acceleration (ft/sec}^2\text{)} \\ 32.2 &= \text{Acceleration of gravity (ft/sec}^2\text{)} \end{aligned}$$

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

54. RACE COURSE SHOWLINE. During the race, aircraft occupy a raceway around the race course. The edge of this raceway closest to the spectator area is generally the showline over which no aircraft is permitted to pass while racing.

a. *The raceway width may vary* from 150 feet to 500 feet in the various racing classes to allow aircraft to pass one another. The critical requirement is that no racing aircraft is permitted to pass over the showline during the race.

b. *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) should also be defined. Racing classes with a maximum speed of 250 miles per hour or less require a spacing of 500 feet between the spectators and the showline. The unlimited racing class (or other new classes with speeds in excess of 250 miles per hour) requires a spacing of 1,000 feet between the spectator and the showline.

c. *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 at the moment it departs the aircraft. The straight line distance that the debris will fall before hitting the ground (ignoring air resistance) will depend upon aircraft speed and aircraft altitude. This distance is called the "scatter distance."

(1) *A maximum racing altitude* of 250 feet is acceptable for aircraft weighing in excess of 1,000 pounds (presently, the AT-6/SNJ and the unlimited class), and a maximum racing altitude of 150 feet is acceptable for aircraft weighing 1,000 pounds or less (presently the International Formula 1, Sport Biplane and Formula Vee Classes). The length of the scatter distance for each racing class is shown in Appendix 1, Figure 21.

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

$$\begin{aligned} S &= \text{Scatter distance} \\ V &= \text{Aircraft speed (ft/sec)} \\ A &= \text{Aircraft altitude (AGL)} \\ 32.2 &= \text{Acceleration of gravity (ft/sec}^2\text{)} \end{aligned}$$

(2) *The locus of all possible debris impact points* from an aircraft in a turn describes 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 called the "scatter radius" (Appendix 1, Figure 21).

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

$$\begin{aligned} Sr &= \text{Scatter radius (feet)} \\ R &= \text{Turn radius (feet)} \\ S &= \text{Scatter distance (feet)} \end{aligned}$$

(3) *In order to provide an acceptable margin of safety*, the differences between the turn radius and the scatter radius are multiplied by a safety factor of 1.5 and added to the turn radius to define the "safety radius" (Appendix 1, Figure 21).

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

$$\begin{aligned} Sfr &= \text{Safety radius (feet)} \\ Sr &= \text{Scatter radius (feet)} \\ R &= \text{Turn radius (feet)} \end{aligned}$$

(4) *The turn that is critical* 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:

(i) Divide the angle for the turn in question in half.

(ii) Mark off the minimum turn radius for the class of aircraft racing as shown in Appendix 1, Figure 21, from the pylon position to a point on the angle bisector.

(iii) Draw an arc whose radius is the safety radius from the point located in paragraph 54b. No spectator areas should be within this arc.

(5) *In some cases, it may be expedient* to design the race course around the spectator

area. While spectator-to-showline 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 counter-clockwise 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 relationships 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.

55.-58. RESERVED.

CHAPTER 5. BALLOON MEETS AND BALLOON COMPETITIONS

59. PUBLIC SAFETY. Just as with other aviation events, the FAA has the responsibility to ensure public safety during the balloon meets or competitions.

60. BALLOON OPERATIONS. Manned free balloon flight competitions could result in operations at horizontal and vertical distances less than those required by FAR §§ 91.79(b) and (c).

a. *The ground track of balloons* is accomplished solely by varying altitude to take advantage of different wind directions and velocities. The greatest diversity in the wind directions normally occurs in the first 2,000 to 3,000 feet above the surface.

b. *Balloon pilots use these changes* in wind direction and velocity to demonstrate their navigational skills during competitions by maneuvering the balloon to a predetermined point on the ground. These operations can occur at minimum altitudes less than those prescribed in FAR §§ 91.79(b) and (c) when appropriate limitations are developed to protect the public and the participants.

61. DESCRIPTION AND TERMINOLOGY. Appendix 1, Figure 22, is a typical hot air balloon. Appendix 1, Figure 23, is terminology generally associated with balloons.

62. BALLOON MEETS. Balloon meets and races are held throughout the country. As ballooning grows, competitive tasks have been refined and standardized. Currently, the FAA's concern is to ensure applicable requirements are met and safety regulations are complied with so that neither members of the public nor ballooning participants are endangered.

a. *Target areas* must be under the control of the event officials. These officials must have adequate manpower to maintain crowd control. Portable "bull horns" or public address systems

are an adequate means for controlling crowd movements or for directing balloonists away from the target area in an emergency.

b. *Balloon landings* are not normally permitted closer than 1,500 feet from the target or goal, although in certain instances, event officials may announce a reduction of this distance to 500 feet for safety considerations. Only members of official recovery crews may be present at the landing site.

c. *For events sanctioned by the various ballooning organizations*, organizers submit a set of competition rules when they apply for a waiver. This is not a regulatory requirement but should be encouraged for the sake of conformity and safety improvement.

63. TYPES OF COMPETITIVE TASKS. Since wind is the only force that moves a balloon laterally over the ground, competitive tasks are basically exercises in navigation according to wind direction. The winner of a particular task is the balloonist who can best take advantage of changes in wind direction, by ascending and descending, to accomplish the task. Sponsors of ballooning events are encouraged to use "launch directors" for competitive tasks to control staggered launch times and provide additional safety for multiple launches. The Balloon Federation of America (BFA) has provided information on some typical balloon competition tasks which may be conducted at balloon meets. A typical event would task the balloonist to ascend and move from one location to another and drop one or more markers as close to a goal, target, or objective as possible. The BFA has a recommended procedure which establishes minimum distances between target drop marker areas and balloon descent and landing areas. That distance is usually at least 1,500 feet. An immediate landing after an event is at the pilot's discretion.

a. **Pilot Declared Goal (PDG).** In this event, balloonists must define their goals or targets by description and by map reference. The goals are declared in writing and given to a time-keeper. Each pilot flies from the designated launch area and attempts to drop a marker as close as possible to the declared goal. The resultant distance from the declared goal to the marker is then measured. The shortest distance wins. Descent and landing after dropping the marker should be at least 1,500 feet from the goal.

b. **Judge Declared Goal (JDG).** Each pilot ascends from the designated launch area and attempts to drop a marker as close as possible to a goal set by the officials. The resultant distance from the JDG to the marker is then measured. Again, the shortest distance wins. Descent and landing after dropping the marker should be at least 1,500 feet away from the goal.

c. **Multiple Judge Declared Goal (MJDG).** 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 resultant distance from the marker to the goal is measured and the shortest distance wins. Descent and landing after dropping the marker should be at least 1,500 feet away from the goal.

d. **Elbow (ELBO).** In this event, the balloon launch area is situated at the center of two concentric circles. Each balloonist ascends from the launch area and travels in any desired direction. After traveling to a pilot selected point somewhere between the inner and outer circle, a marker is dropped. The takeoff axis is hereby established as the direction from the takeoff point to the point at which the first marker is dropped. Hereafter, each balloonist attempts to achieve a 180° change in direction from the takeoff axis. The greatest change of flight direction with the smallest angle of divergence is best. After traveling at least 5,000 feet from the first marker (but still within the outer circle), a second marker

is dropped. The angle of divergence is then measured in degrees, relative to the takeoff axis.

e. **Hare and Hound (HNH).** 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 launched balloons, "the hounds." The hounds try to drop markers as close as possible to the target placed on the ground by the hare balloon. After dropping the marker from each hound balloon, landing is at the pilot's discretion but should be more than 1,500 feet from the target.

f. **Convergent Navigational Task (CNT).** Officials establish a goal, but balloonists 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 begins. Each pilot launches and 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. After dropping the marker from each hound balloon, descent and landing is at the pilot's discretion but should be more than 1,500 feet from the target.

g. **Fly On Task (FOT).** The pilot declares a goal to fly to after dropping a marker in another task.

h. **Gordon Bennett Memorial (GBM).** The competitors maneuver their balloons a prescribed distance from a target on the ground (scoring area). Through use of the winds, they attempt to maneuver back to the scoring area and drop markers on the target. Standard BFA landing procedures should be observed.

i. **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 established by the officials, then flies on 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 (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.

j. **Key Grab.** One of the most popular events for both the participants and the spectators is the 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 from a predetermined distance from the target. The object of the event is to maneuver the balloons (one-by-one) over the target by altitude changes 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.

64. BALLOON COMPETITION EVENT WAIVERS. To be eligible for a waiver of FAR §§ 91.79(b) and (c), the applicant must prepare and keep current an operations manual that has been approved by the FAA FSDO having jurisdiction over the proposed balloon competition. The contents of the manual are the basis for the issuance of the waiver. The applicant and the participants must comply with the manual contents and requirements.

a. *A waiver of FAR §§ 91.79(b) and (c) for organized free balloon competitions can be issued based on submission of a proper application which contains the proposed operations and contents of the Organized Manned Free Balloon Competition Manual.*

b. *FAR § 91.79 shall be waived only to the extent necessary to accommodate the event, and then only if the waiver allows an acceptable level of safety. Evaluation of the site determines the actual separation distances to be used for a specific event; however, the following minimum distances and special provisions must be observed:*

(1) *FAR § 91.79(b) may be waived to allow flight over a congested area of a city, town, or settlement at an altitude of no less than 500 feet above the highest obstacle within a horizontal radius of 500 feet of the balloon. This section of the regulation may only be waived within a specified maximum distance from the designated launch sites and/or target areas. This designated area must be determined by the sponsor and FAA, and must be clearly delineated in the sponsor's manual before the event. (A scaled map, drawing, and/or aerial photographs should be in the sponsor's manual before the event.) The designated area should be the minimum area necessary to accommodate the specific events planned and should be consistent with the ability of the sponsor to control operations. In addition, if the target area is so small that a normal descent (200 to 300 feet per minute) cannot be made to the target, then a waiver of FAR § 91.79(b) should not be issued.*

(2) *FAR § 91.79(b) may also be waived to allow flight over, but no less than 75 feet from, any open-air assembly of persons (designated spectator area) under the direct control of the sponsor who has been issued the waiver. The balloon must have attained a state of altitude equilibrium at this 75-foot minimum altitude and not be descending while crossing over the designated spectator area.*

(3) *FAR § 91.79(c) may be waived to allow flight over open water or sparsely populated areas no closer than 200 feet to any person, vessel, vehicle, or structure.*

(4) *The target area around the "key grab" event* must be totally clear of spectators and under the control of the event officials. These officials must have adequate manpower to maintain crowd control. Sponsors should either have portable "bull horns" or a public address system to control the crowd movements verbally or to direct the balloonist away from the target area in the event of an emergency. If these precautions are observed, then a waiver of FAR § 91.79(c) can be issued to allow operations closer than 500 feet to the crowd. The event sponsor must establish procedures to ensure that the balloonists will abort the key grab attempt when 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 balloon landing areas must be segregated from the spectators. Only designated members of the recovery crews can be present to assist the balloonist with recovery. All of these requirements must be briefed to all participants before the operations.

65. BALLOON COMPETITION MANUAL. The Organized Manned Free Balloon Competition Manual must incorporate FAR §§ 91.79(b) and (c) limitations, as appropriate, to the specific event in a form and manner acceptable to the FAA and the sponsor. The sponsor should reflect the manner of operations under the event waiver as clearly as possible in the manual. The operations manual shall include a list and description of all events, tasks, and races to be included in the waiver. The inspector should encourage the sponsor to place the aircraft operating procedures and other safety-related procedures in a separate section of the manual, which is subject to review and approval by the FAA.

66. BALLOON CREWMEMBERS. Only crewmembers may be carried on board any balloon operating under the waiver issued to the sponsor. All crewmembers must be designated by the pilot in command and have been given appropriate training in the conduct of their duties. These designated crewmembers must sign on the

waiver form that they have been briefed, that they understand the limitations of the waiver under which they are operating, and that they are designated crewmembers for the purpose of the specific flight under the waiver. The pilot in command of each balloon using additional crewmembers is responsible for obtaining and keeping such statements.

67. MAXIMUM WINDSPEED. The maximum windspeed for launch and at the target zones is mutually determined by the sponsor and the FAA. These limitations shall be placed in the operations manual. The maximum windspeed limitations should be determined considering the local terrain conditions and the competency of the participating airmen. The actual means of determining the windspeed must be mutually agreeable to the FAA and the sponsor. The inspector and/or the sponsor may wish to consider moving the designated spectator area barriers if the windspeed increases.

68. DESIGNATED SPECTATOR AREA. The designated spectator area should be maintained at a minimum radius of 200 feet away from the designated or declared goal/target. This 200-foot minimum target area should remain sterile except for officially designated event personnel.

69. DURATION OF WAIVER. No operations shall be conducted under this waiver except during the period from sunrise to sunset and during Visual Flight Rules conditions as specified in FAR § 91.105.

70. LETTERS OF AGREEMENT. A letter of agreement clearly detailing all responsibilities provides an excellent means of control. This means of control has been successfully used in various cases. For example, the sponsor of the balloon meet outlines the responsibilities he or she assumes, such as crowd control, notification, communication, briefing of participating pilots, etc., in the manual. Air Traffic identifies the services they provide, such as up-to-date weather,

a portable tower, or a direct communication line with the tower.

71. CARRIAGE OF PASSENGERS FOR HIRE. Under the provisions of FAR § 135.1(b)(7), persons engaged in carrying passengers for hire using balloons are not subject to FAR Part 135.

72. MANUAL APPROVAL. The aircraft operating and other safety-related procedures contained in the balloon competition manual must be approved by the inspector assigned to evaluate it. The approved procedures must be incorporated into the waiver.

73.-76. RESERVED.

CHAPTER 6. PARACHUTING AND PARACHUTISTS

77. CERTIFICATE OF AUTHORIZATION.

While many of the activities associated with aviation events frequently require waivers, parachuting or skydiving demonstration jumps do not require waivers. As provided for in FAR Part 105, some of these jumps do require an FAA Form 7711-1, Certificate of Waiver or Authorization. FAR § 105.15 is applicable to jumps over or into congested areas or open-air assemblies of persons. FAR § 105.19 is applicable to jumps in or into control zones with functioning control towers. FAA Form 7711-1 is required for any jump over or into a congested area.

a. *The drift-over provision of FAR § 105.15* permits a jumper to exit an aircraft over something other than a congested area, and with a fully-deployed parachute, drift over a congested area or open-air assembly of persons, and land in an open area. Under these circumstances an FAA Form 7711-1 is not required.

b. *The key to determine if an authorization is required* are the words "over or into." In other words, 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 parachutist has obtained an FAA Form 7711-1.

78. **PARACHUTE ASSOCIATIONS/ORGANIZATIONS.** Parachutists who are not members of a recognized parachute organization or the participating branch of a national aero club and who wish to participate in a demonstration or exhibition jump over or into a congested area must present satisfactory evidence of the necessary experience, knowledge, and skill equivalent to that required by the United States Parachute Association (USPA).

a. *If the parachutist is unable to provide this information*, the FAA inspector-in-charge may require a demonstration jump (not over a

congested area) as a prerequisite before approving the request.

b. *The USPA*, located at 1440 Duke Street, Alexandria, VA 22314, telephone (703) 836-3495, has adopted its own safety rules and licensing standards for parachutists, instructors, and jumpmasters. The USPA has pledged to implement a policy of self-policing to assist the FAA in avoiding conflicts with other airspace users and to maintain a high level of safety. Toward this end, the USPA has supplied every FAA FSDO with a brochure of its rules and safety programs and have offered their assistance anytime the FAA encounters problems with a particular club or has questions regarding parachuting.

79. **PARACHUTIST'S COMPETENCE.** The competence of parachutists is extremely important when evaluating the suitability of a landing site.

a. *Holders of USPA Class C and D licenses* have proven themselves to be highly skilled. Anyone holding such a license who has actively participated in the sport within the last 12 months should be competent to participate in any jump where the separation criteria meets or exceeds that established in a Level One landing area. (See paragraph 80a.)

b. *Persons holding a USPA Class D license with a current exhibition (Pro) rating* have demonstrated the additional skills that are necessary to permit exhibition demonstrations in accordance with the separation criteria established in a Level Two landing area. (See paragraph 80b.)

c. *USPA exhibition ratings* are issued to members who have a Class D license and who have accomplished 10 successive jumps into a 10-meter (32-foot) diameter target area in accordance with the following criteria:

(1) *All landings* must be made standing up.

(2) *The size of the canopy* used during the exhibition certification determines the canopy limitation allowed in actual demonstration jumps (i.e., smallest canopy demonstrated).

(3) *Demonstration jumps* must be witnessed by either a safety and training advisor (SATO) or by an instructor/examiner (I/E), and at least two other spectators.

(4) *USPA issues the added exhibition rating* with an expiration date 12 months from the certification date. Members are renewed on the basis of continued demonstration of the original certification requirements.

80. LANDING AREAS. USPA divides landing areas into two distinct categories, depending on the demonstrated competency of the parachutists.

a. *Level One.* Parachutists who hold a USPA Class C or D license must select a landing

area that permits the jumper to land no closer than 50 feet from any spectator and does not involve passing over persons on the surface at an altitude of less than 250 feet.

b. *Level Two.* Parachutists who hold a USPA Class D license with an exhibition (Pro) rating and who certify that they shall use a steerable square main and reserve canopy, shall be permitted to exit over or into a congested area. The selected landing area must permit the jumper to land no closer than 15 feet from any spectator and does not involve passing over persons on the surface at an altitude of less than 50 feet.

81. ALTERNATE LANDING AREAS. Regardless of the experience of the parachutists, "runoffs" or "escape areas" should be considered. Small target areas may be acceptable when a suitable alternate landing area is available in the event of unexpected conditions.

82.-86. RESERVED.

CHAPTER 7. WAIVER PROVISIONS

87. GENERAL PROVISIONS.

a. *Each FAA Form 7711-1, Certificate of Waiver or Authorization*, shall include general and special provisions developed by the issuing FAA FSDO. Many safety provisions are general in nature and are applicable to all aviation events. The FAA FSDO will tailor the general and special provisions to accommodate the sponsor's needs.

b. *Provisions that appear on the waiver* shall be restricted to protective measures, controls, or requirements that are not otherwise specified by the FAR.

c. *Regulatory requirements* (not waived) shall not be included as special provisions.

d. A *sample* of general provisions can be found in Appendix 2.

88. SPECIAL PROVISIONS. Special provisions are conditions, requirements, or limitations necessary to protect persons and property on the surface and other users of the national airspace system.

a. *Ensuring Safety.* The special provisions of FAA Form 7711-1 ensure that the aviation event can be conducted without an adverse effect on safety. Every airshow waiver shall contain special provisions to ensure adequate public and non-airshow traffic safety. There may be a wide

variation in the type of special provisions called for.

b. *Use of Special Provisions.* Some events require extensive and highly detailed special provisions, whereas others can be fairly simple. In addition to variation among events, local conditions have much to do with what special provisions are necessary.

(1) *Special provisions shall pertain to* protective measures and control requirements which are not specifically covered by the FAR.

(2) *It may be necessary* to increase one regulatory minimum in order to authorize safe deviation from another.

(3) *In order to permit aerobatic flight* in a control zone or near a busy airport, it might be necessary to increase the minimum visibility requirement to 5 miles.

c. *Responsibility for compliance* with the terms of the waiver issued for aerobatic practice areas rests with the pilot. In cases where the waiver is issued for members of an organization, a designated individual responsible for overseeing compliance with the terms of the waiver should be identified to the FAA.

d. A *sample* of special provisions can be found in Appendix 3.

89.-92. RESERVED.

APPENDIX 1. FIGURES

Figure 1. Showline

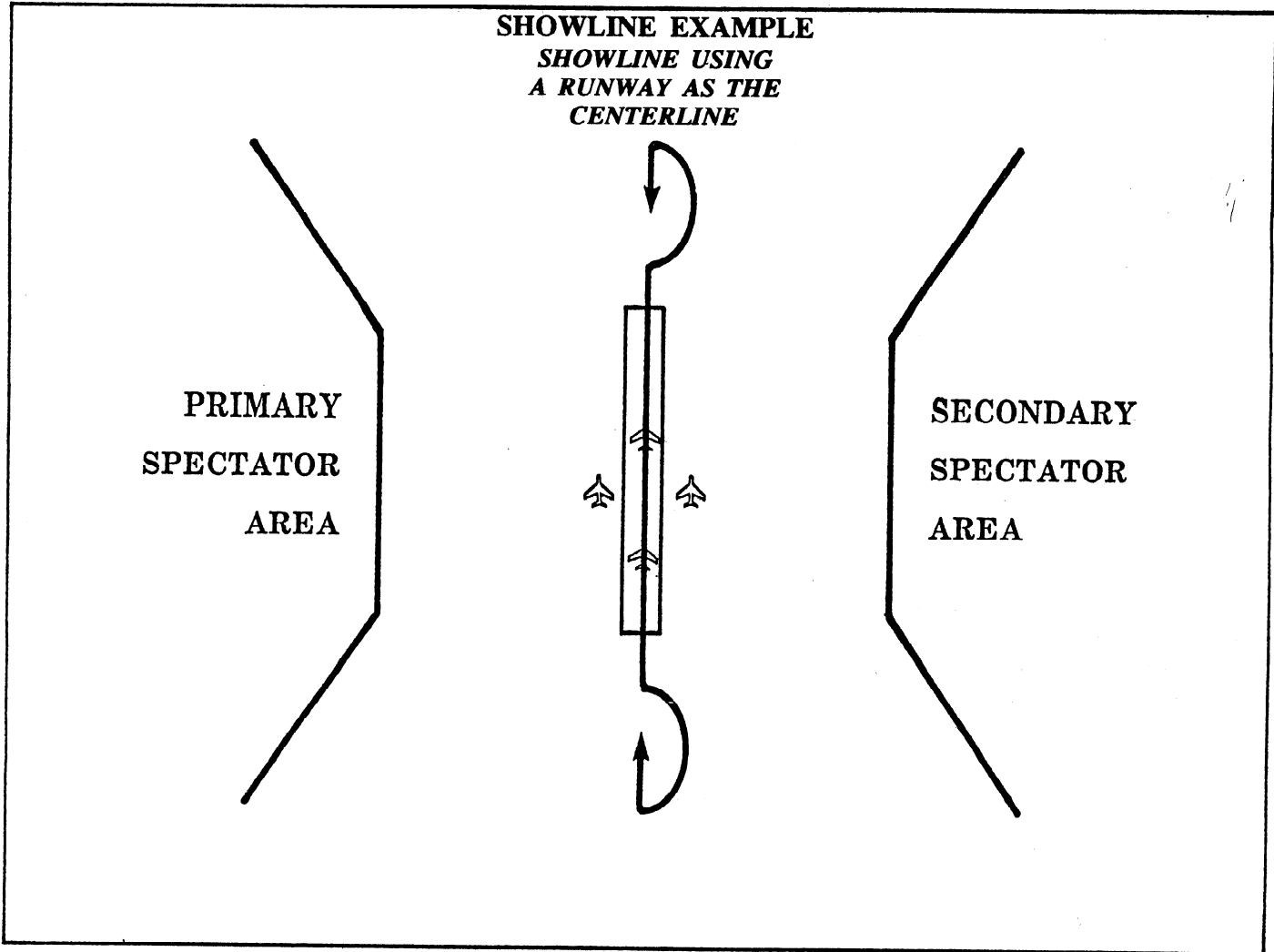


Figure 2. Ingress

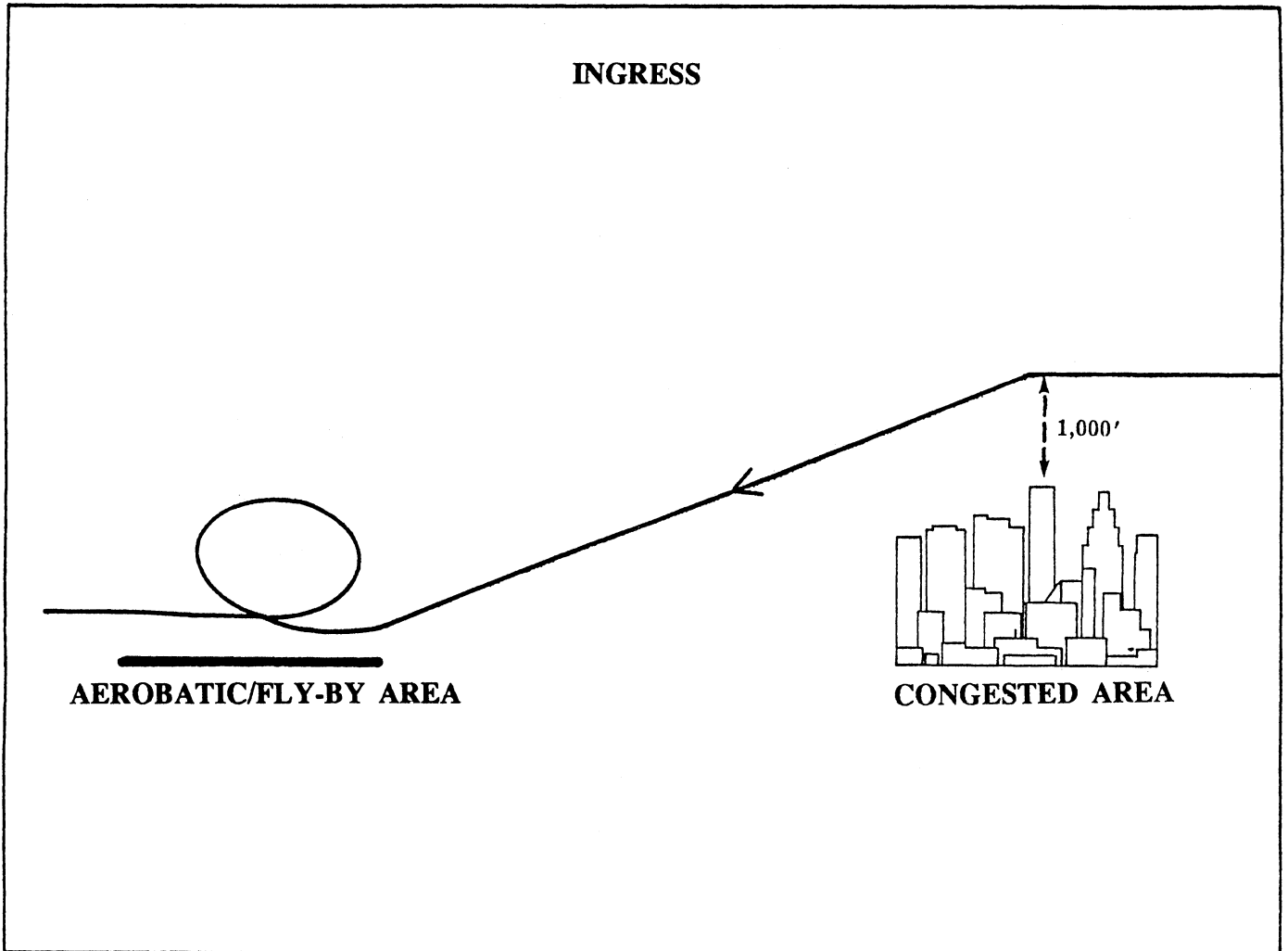


Figure 3. Egress

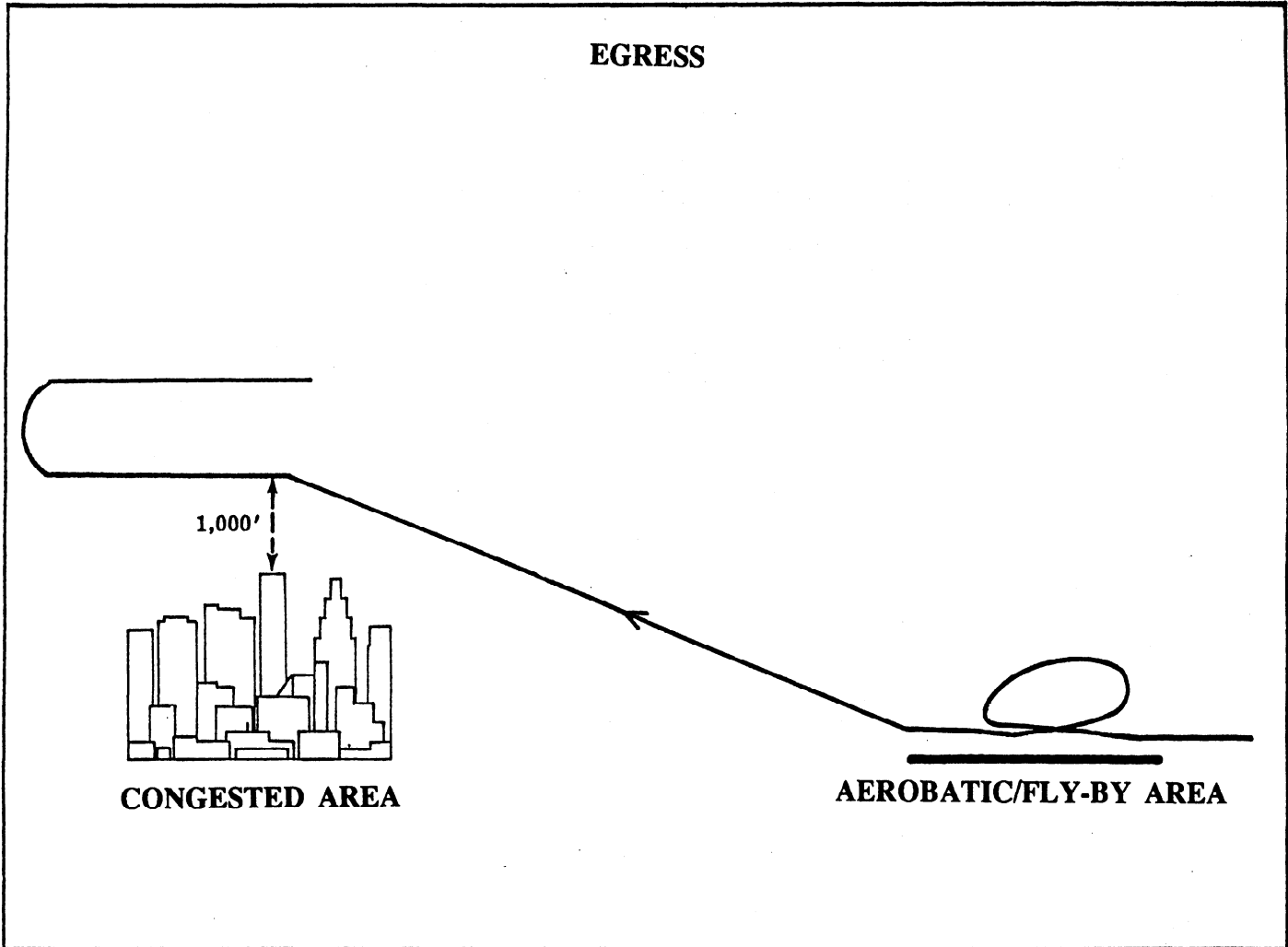



Figure 4. Sample of FAA Form 8710-7, Statement of Aerobatic Competency

FRONT

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION STATEMENT OF ACROBATIC COMPETENCY	
PILOT Tommy Cartwright	
TYPE CERTIFICATE/NUMBER Commercial 765438284	
ISSUANCE DATE 10-30-89	EXPIRATION DATE 10-31-90
GENERAL AVIATION OPERATIONS INSPECTOR (Signature)  Donald R. Blackwell ASW-FSDO-1	

FAA Form 8710-7 (5-78)

BACK

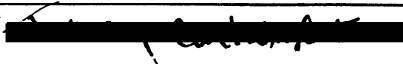
MANEUVER LIMITATIONS None	
ALTITUDE LIMITATIONS Per Waiver/FAR	AUTHORIZED AIRCRAFT Pitts Special
I understand that this statement of competency does not authorize deviation from FAR 91 except as defined by waiver thereto, or to the terms of Special Provisions contained in any waiver to FAR 91.	
PILOT (Signature) 	

Figure 5. Category I Showline - Optimum Layout

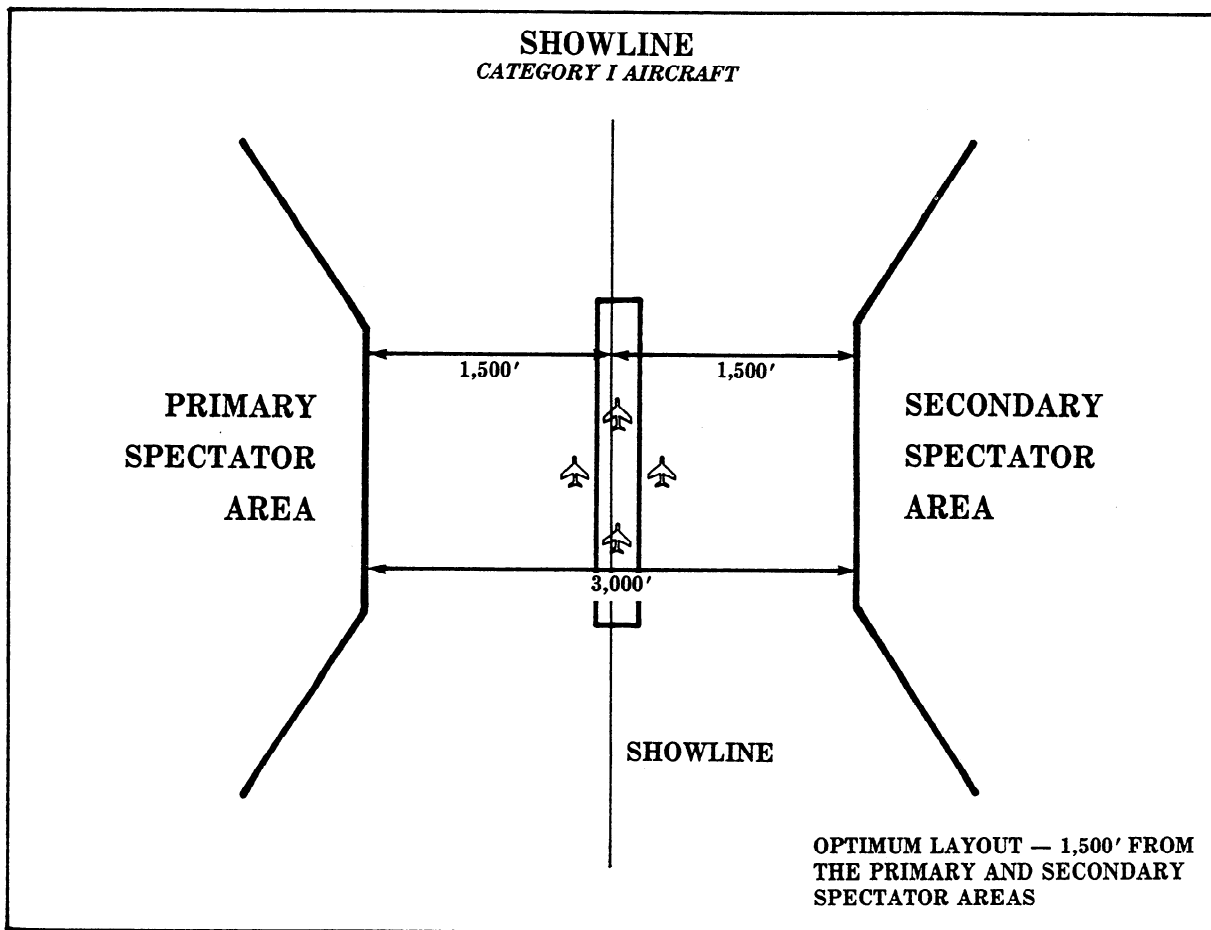


Figure 6. Category I Showline - Moved Closer To
Primary Spectator Area

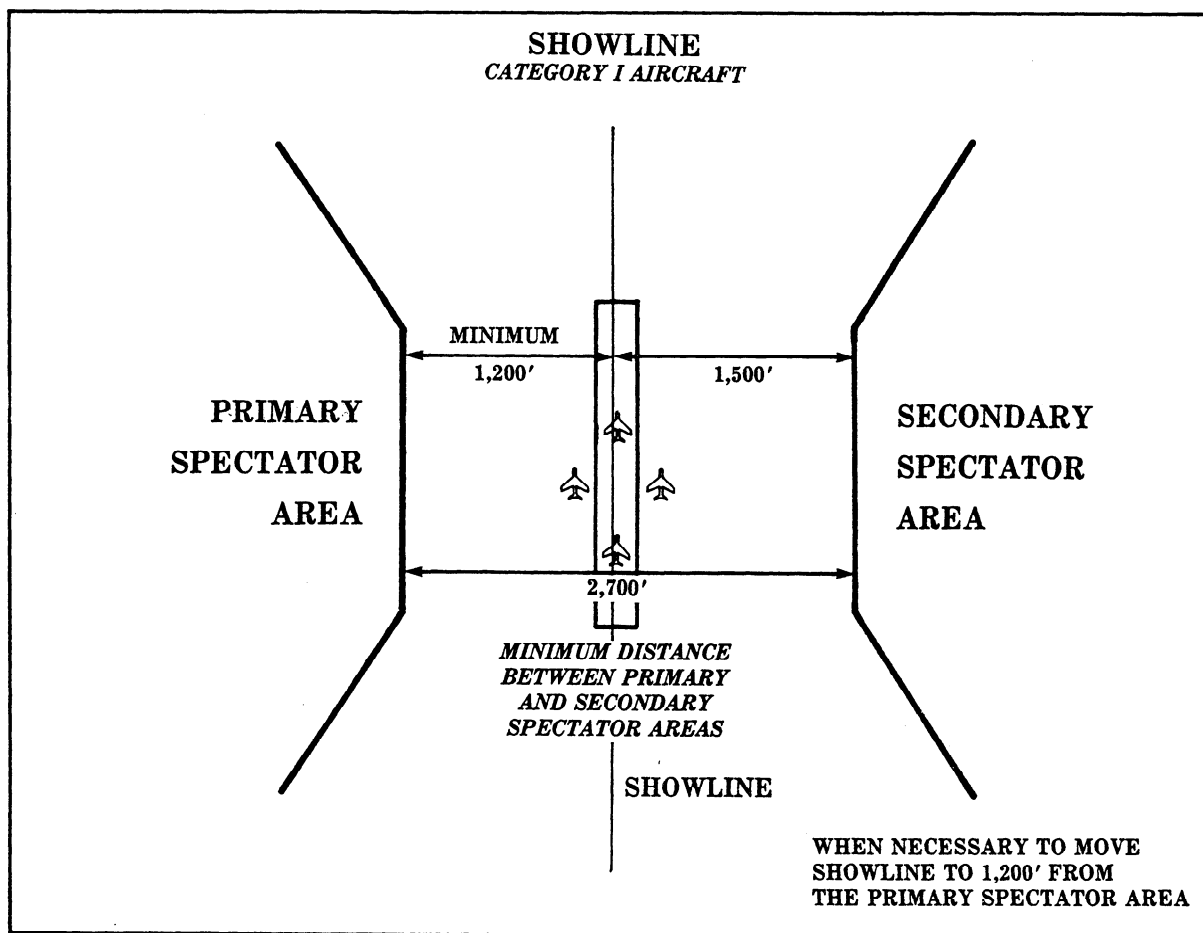


Figure 7. Category I Showline - Moved Closer To
Secondary Spectator Area

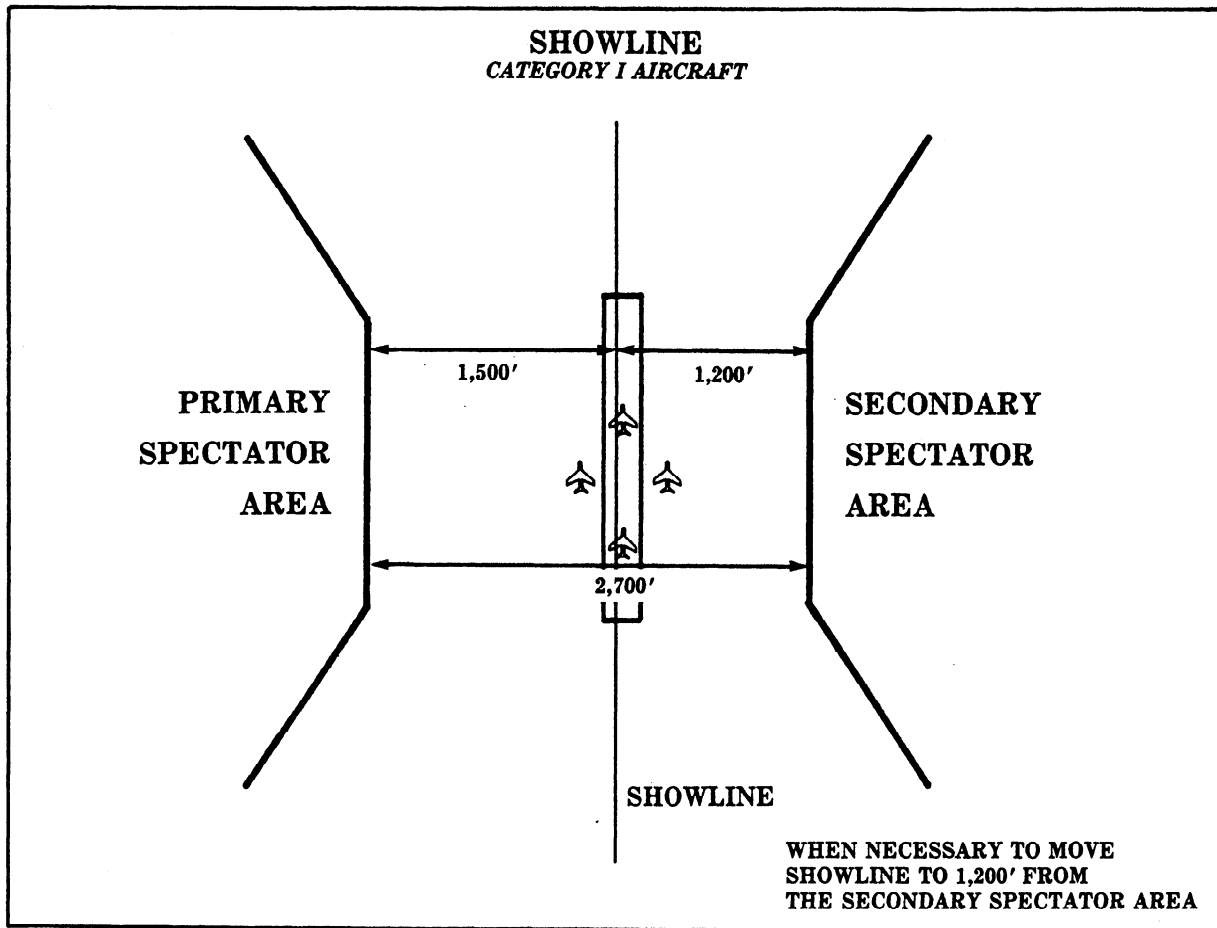


Figure 8. Category II Showline

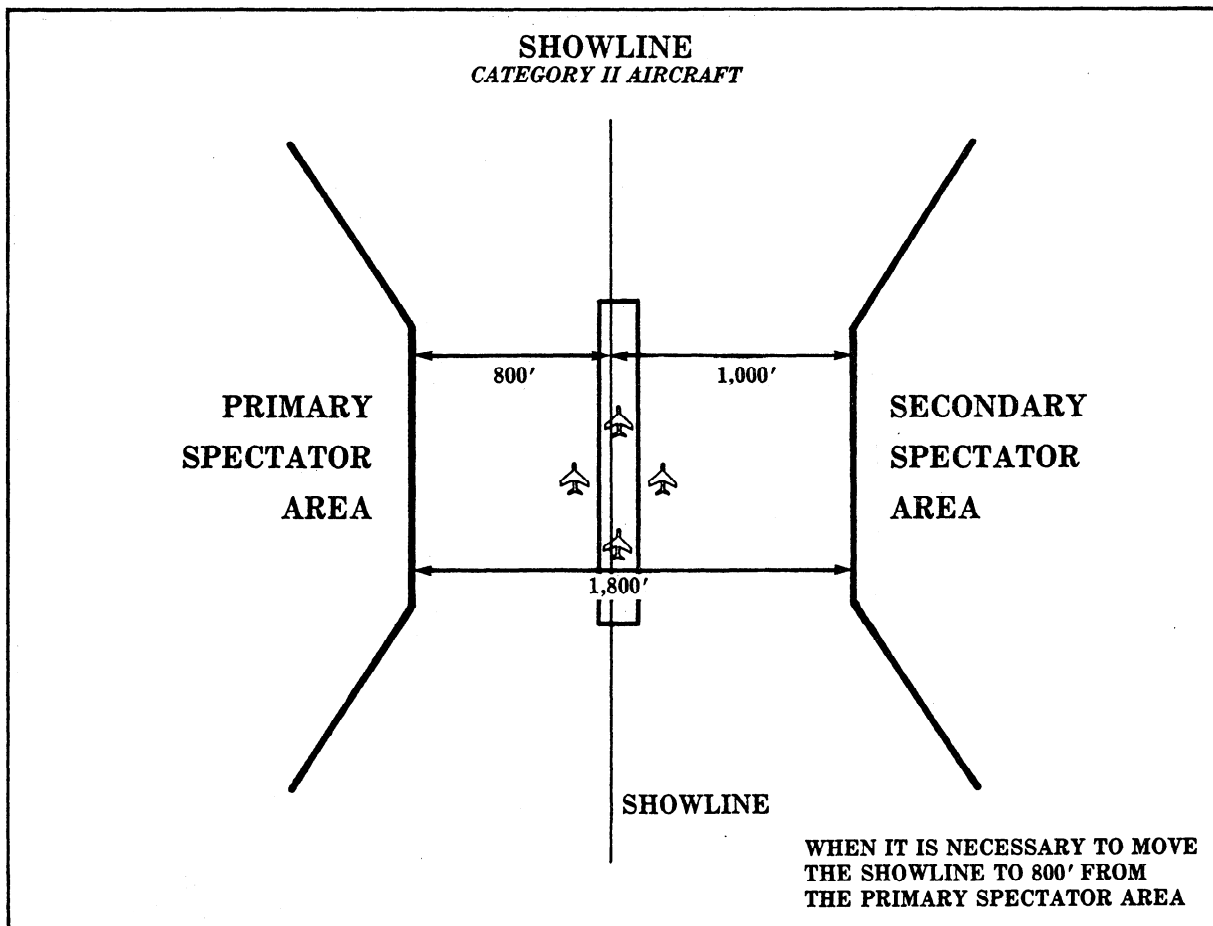


Figure 9. Category III Showline

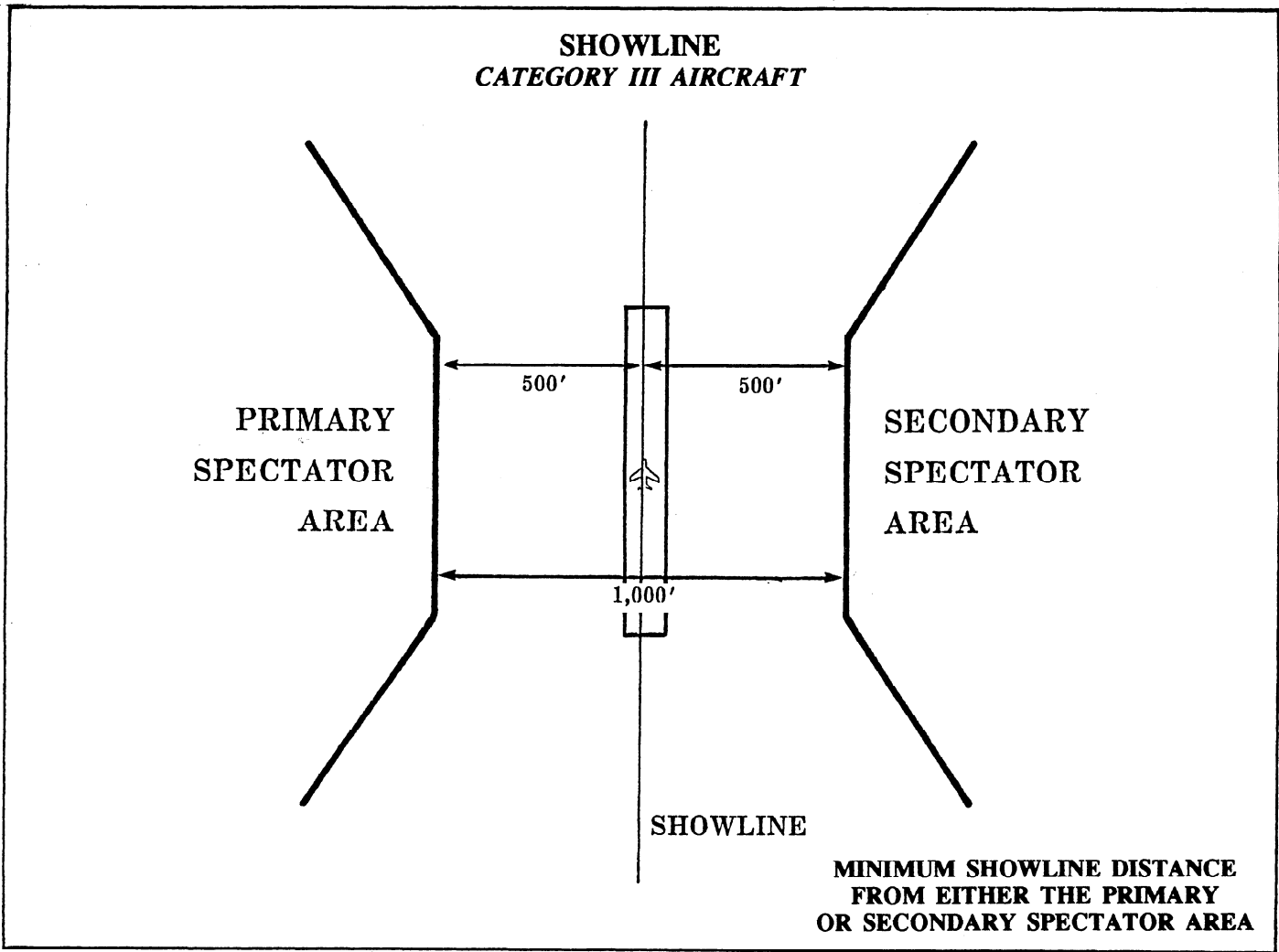


Figure 10. Aerobatic Maneuvers After Takeoff (I)

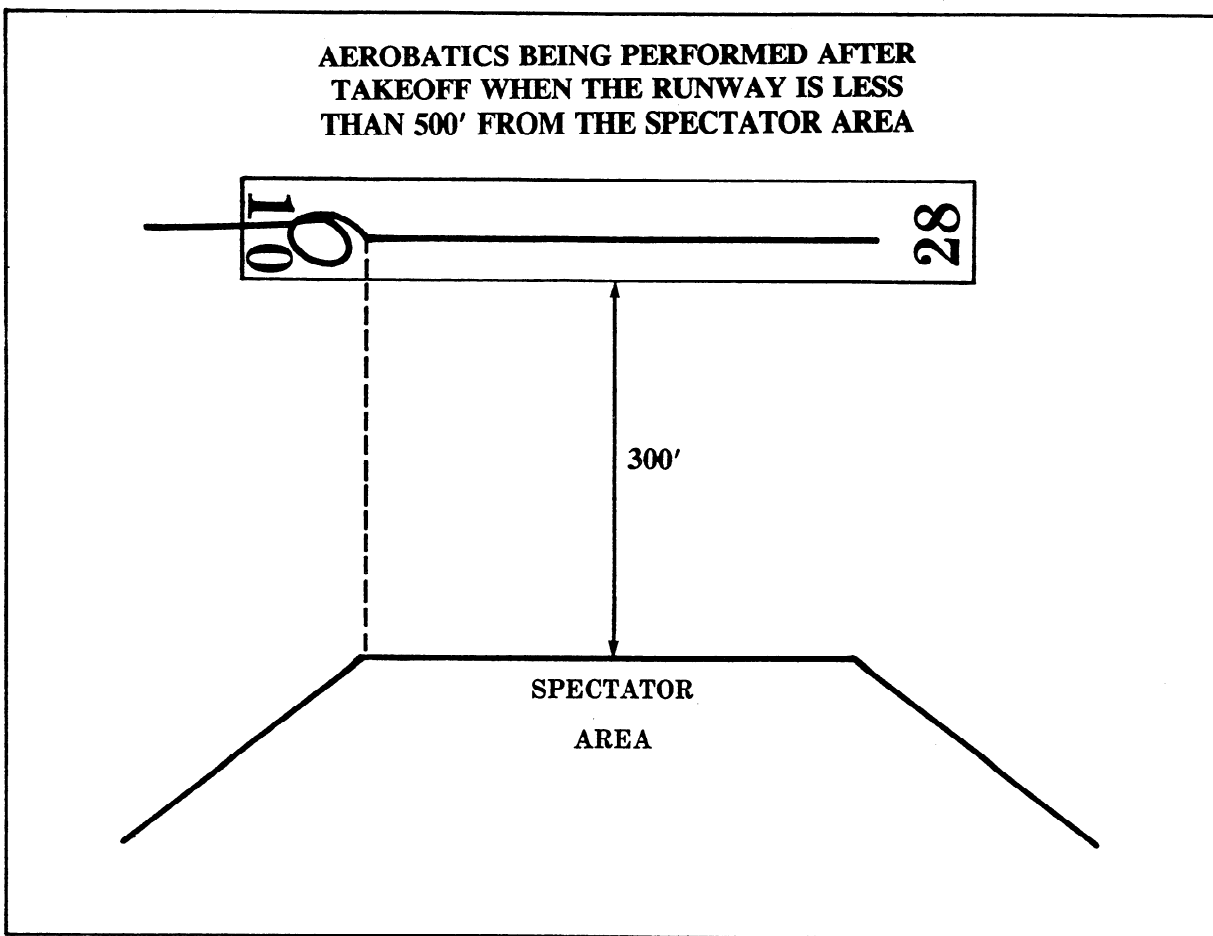
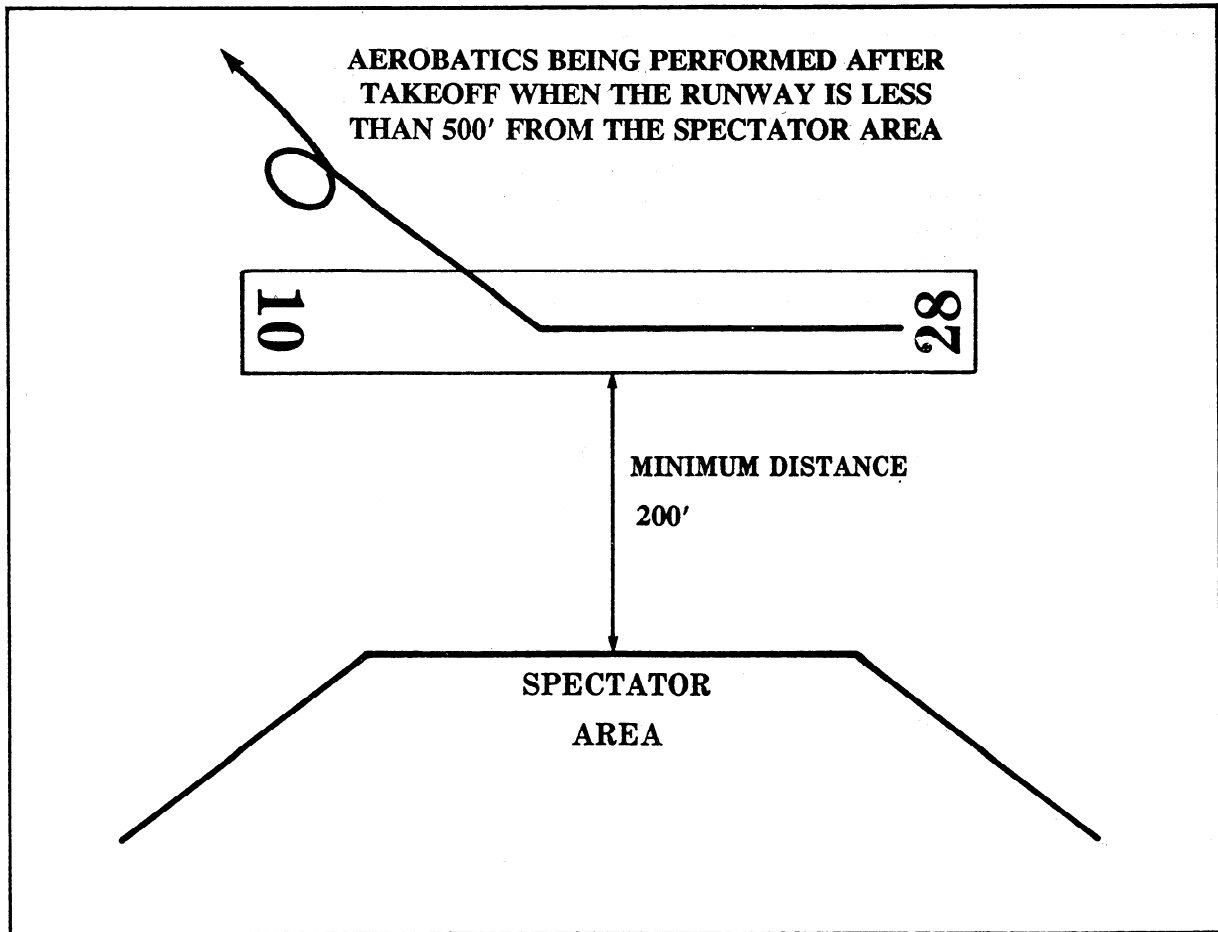


Figure 11. Aerobatic Maneuvers After Takeoff (II)



**Figure 12. Takeoff and Landing Area - Normal Landing
Speed >100 Knots and "Flying Farmer" Acts**

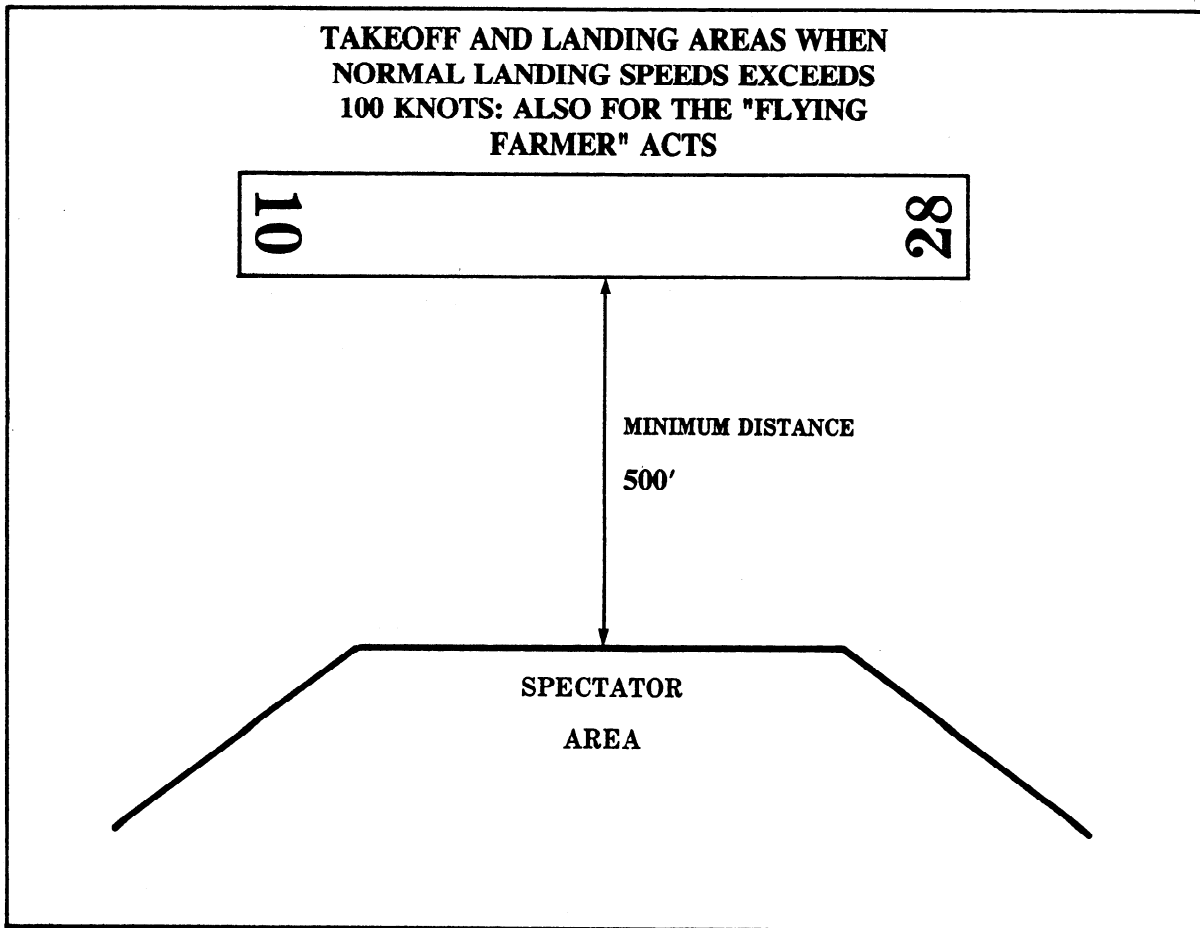


Figure 13. Takeoff and Landing Area - Normal
Landing Speed <100 Knots.

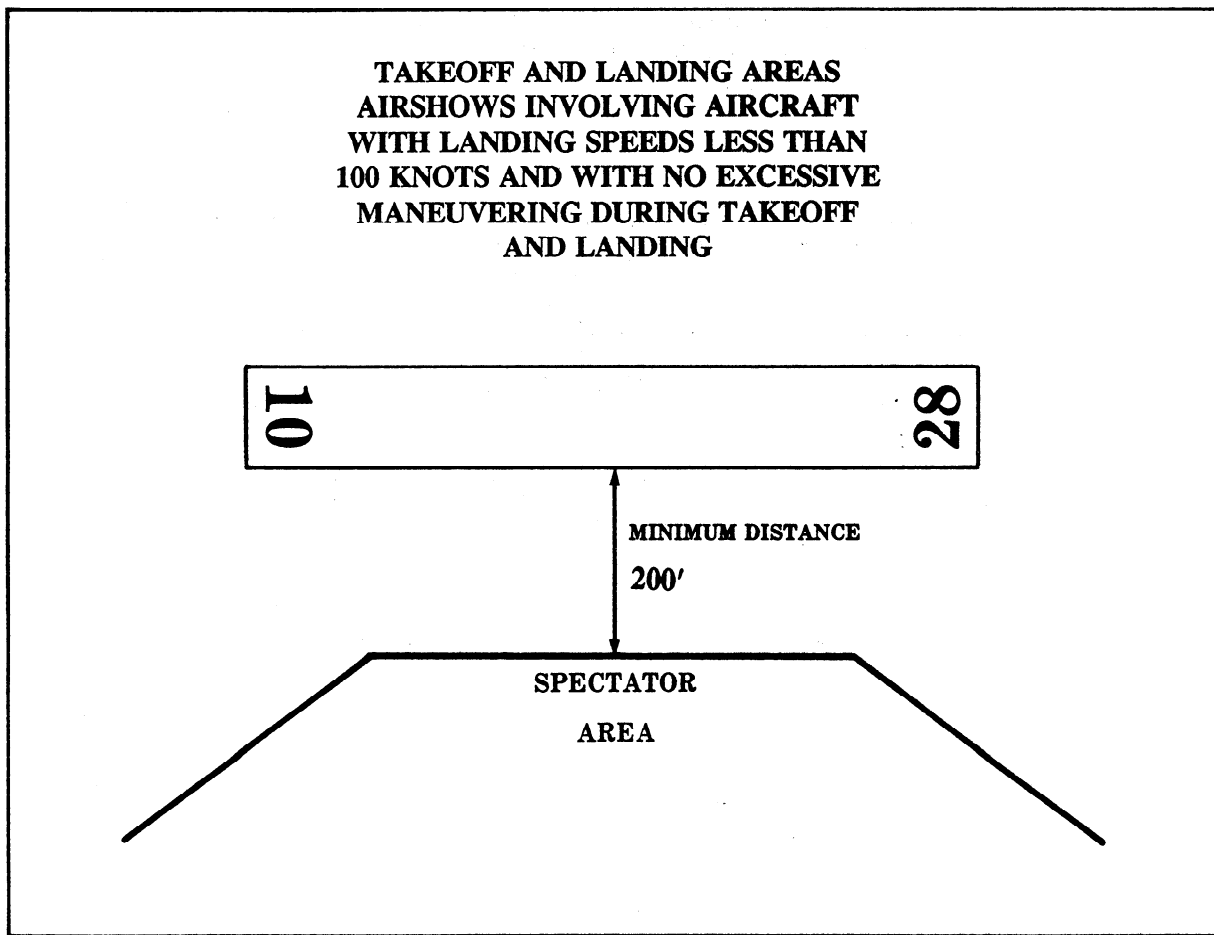


Figure 14. Sailplane/Airplane Takeoff Area (I)

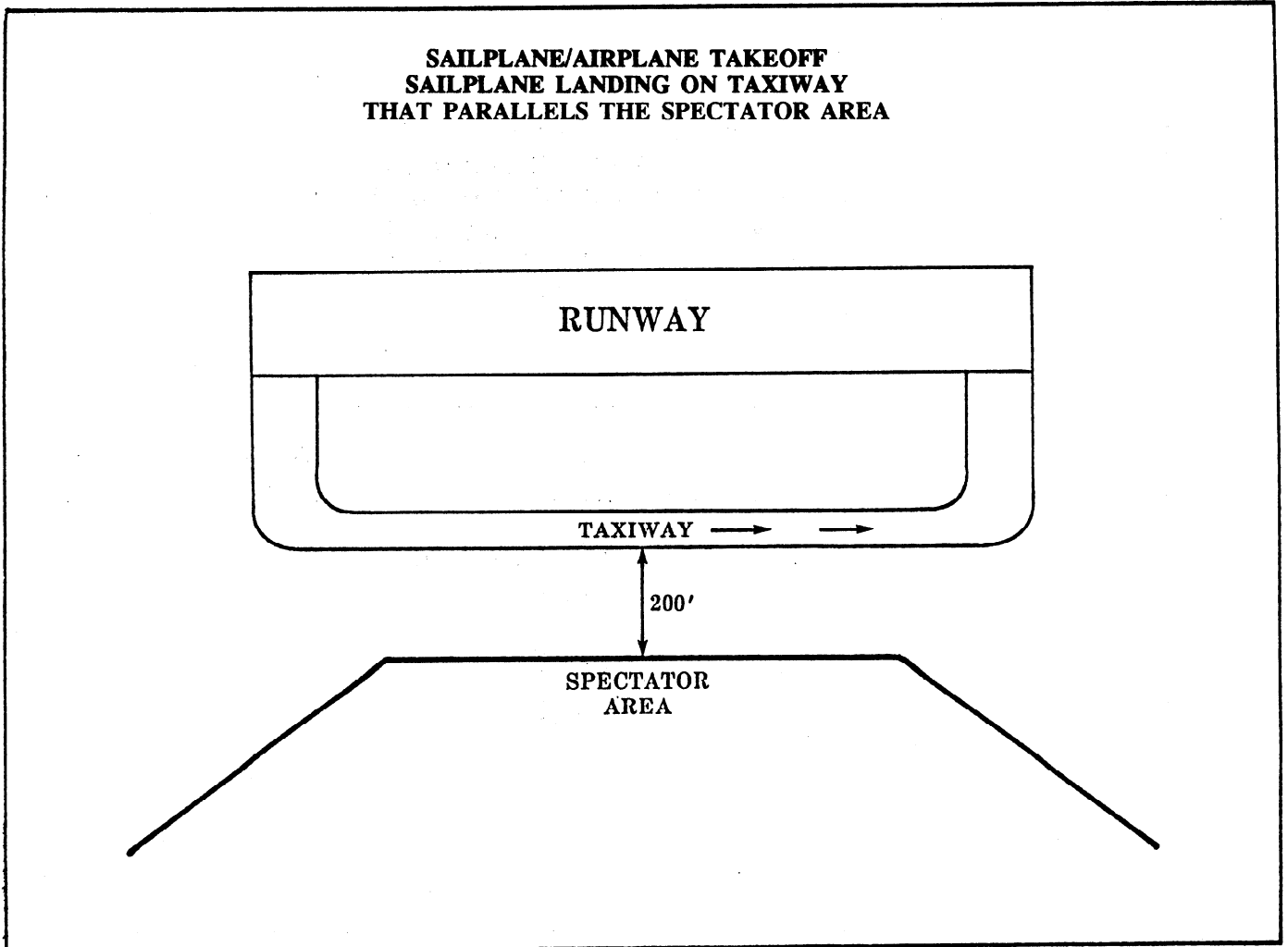


Figure 15. Sailplane/Airplane Takeoff Area (II)

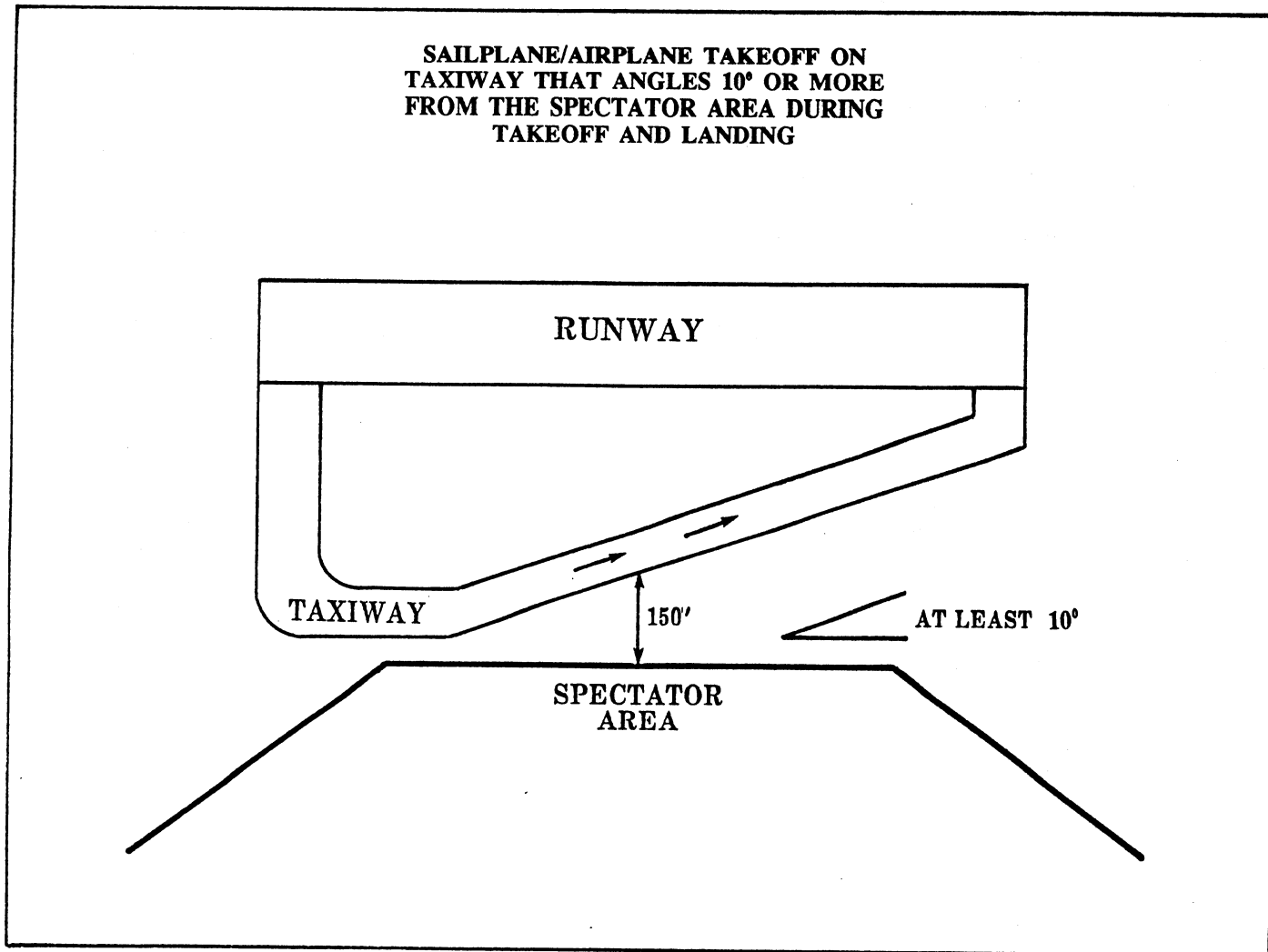


Figure 16. Instructions for Completion of FAA Form 7711-2

1. **PREPARING FAA FORM 7711-2.** Items from the form are discussed below for purposes of clarity and uniformity of its use.

a. **Items 1 and 2, Name of Organization/Name of Responsible Person.** If you are a representative of an organization, then the organization's name should appear in Item 1 and your name, as the organization's representative, for application purposes should appear in Item 2. If you are not representing an organization, the term N/A should be entered in Item 1 and the applicant's name in Item 2.

b. **Item 3, Permanent Mailing Address.** Self-explanatory.

c. **Item 4, FAR Section and Number to be Waived.**

(1) All applicable FAR sections and numbers must be listed in this item. If you are unsure which FAR sections have to be waived, consult the FSDO for guidance before filling out this section.

(2) An application for a parachuting operation should state that authorization is requested in accordance with FAR §§ 105.15 or 105.19.

d. **Item 5, Detailed Description of Proposed Operation.** It is sufficient to use the terms "airshow," "aerobatic contest," "aerobatic practice area," "parachute demonstration jump," or "air race" to describe the event.

e. **Item 6, Area of Operation.** The description must depict the flight maneuvering area as a cubic or cylindrical cell of airspace, e.g., "a rectangle bounded by the N/S runway (or other definable geographical reference) and a point 5,000 feet east from the surface to 7,000 feet." At off-airport sites, the boundaries should be described using easily identifiable landmarks. Current, properly marked charts, maps, drawings, or photographs of the area of operation (not required for parachute demonstration jumps at aviation events) must accompany the application. The FAA recommends that sponsors use a 7.5 series Topographic Quadrangle Map, published by the U.S. Geological Survey (Scale 1:24,000). Any depiction submitted must include to-scale indications of the flight lines, showlines, race courses, the location of the aviation event control point, police dispatch, ambulance, and firefighting equipment. Photographs and to-scale diagrams may be submitted as supplemental material to aid in the FAA's evaluation of a particular site. All flight operations conducted under the waiver shall be limited to the area defined in the FAA-approved application.

f. **Item 7, Time Period.** List the dates requested for the aviation event and for any press previews that are scheduled. Alternate event dates should also be included in this item.

g. **Item 8, Aircraft Make and Model.** If the type of aircraft and/or the names of the pilots are not known at the time the application is submitted, the FAA shall accept the application with a statement, "list of aircraft and/or pilot's names will be furnished on [date.]" Once the list has been supplied, last-minute substitutions (parachutists or pilots) must show appropriate qualifications to the FAA inspector-in-charge at the aviation event before they are allowed to perform.

h. **Item 9, Sponsorship.** Self-explanatory.

i. **Item 10, Permanent Mailing Address of Sponsor.** Self-explanatory.

j. **Item 11, Policing.** Furnish a detailed explanation of how crowd control will be handled.

k. **Item 12, Emergency Facilities.**

Figure 16. Instructions for Completion of FAA Form 7711-2 - continued

(1) *Place an "X" in the appropriate box or boxes.*

(2) *Other:* A sponsor seldom needs to fill in this block. However, the following is an example of how the "Other" block might prove useful. In one event, the sponsor had a helicopter and pilot continually ready for emergency transportation of spectators or performers who might be injured on the airport or who may become ill during the event. Additionally, a military-trained firefighter and a medic were standing by the helicopter with extinguishers in case an aircraft had an accident anywhere in the operating area. In this particular case, by describing this "Other" emergency facility, the applicant could have been relieved of having to show anything in the preceding blocks.


1. *Item 13, Air Traffic Control.* Describe the method or methods of radio communication frequencies and/or the prearranged ground-to-air signals to be used during the aviation event. A description of the ground-to-air recall signal must also be included.

m. *Item 14, Schedule of Events.* List the performers in the order that they will appear. (See paragraph 19 this AC for more detail.)

n. *Item 15, Certification.* The applicant must sign in this block and on each page of the application.

Figure 16. Sample FAA Form 7711-2, Application for Certificate of Waiver or Authorization (Front) - continued

No certificate may be issued unless a completed application form has been received (14 C.F.R. §1, 101, and 105).

 U.S. Department of Transportation Federal Aviation Administration		Form Approved: O.M.B. No. 2120-0027				
		APPLICANTS — DO NOT USE THESE SPACES				
		Region		Date		
		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 8 only and the certification, item 15, on the reverse.						
1. Name of organization			2. Name of responsible person			
3. Permanent mailing address	House number and street or route number	City	State and ZIP code	Telephone No.		
4. FAR section and number to be waived						
5. Detailed description of proposed operation (Attach supplement if needed)						
6. Area of operation (Location, altitudes, etc.)						
7a. Beginning (Date and hour)			b. Ending (Date and hour)			
8. Aircraft make and model (a)	Pilot's Name (b)	Certificate number and rating (c)	Home address (Street, City, State) (d)			

FAA Form 7711-2 (6-86) Supersedes Previous Edition

Figure 16. Sample FAA Form 7711-2, Application for Certificate of Waiver or Authorization (Reverse) - continued

ITEMS 9 THROUGH 14 TO BE FILLED OUT FOR AIR SHOW/AIR RACE WAIVER REQUESTS ONLY.				
9. The air event will be sponsored by:				
10. Permanent mailing address	House number and street or route number	City	State and ZIP code	Telephone No.
11. Policing (Describe provisions to be made for policing the event.)				
12. 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 type="checkbox"/> Other — Specify _____ <input type="checkbox"/> Ambulance <input type="checkbox"/> Crash wagon _____				
13. Air Traffic control (Describe method of controlling traffic, including provision for arrival and departure of scheduled aircraft.)				
14. Schedule of Events (Include arrival and departure of scheduled aircraft and other periods the airport may be open.)				
Hour (a)	Date (b)	Event (c)		
<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>				
<div style="display: flex; align-items: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; width: 20px; height: 20px; margin-right: 5px;"></div> <div style="font-size: 0.8em; margin-left: 5px;"> Please Read </div> </div> <div style="margin-left: 25px; font-size: 0.8em;"> 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. </div>				
15. Certification — I CERTIFY that the foregoing statements are true.				
Date	Signature of applicant			
Remarks				

FAA Form 7711-2 (6-96) Supersedes Previous Edition

Figure 17. Sample FAA Form 7711-1, Certificate of Waiver or Authorization

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION	
CERTIFICATE OF WAIVER OR AUTHORIZATION	
ISSUED TO	
ADDRESS	
<p>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.</p>	
OPERATIONS AUTHORIZED	
LIST OF WAIVED REGULATIONS BY SECTION AND TITLE	
STANDARD PROVISIONS	
<ol style="list-style-type: none"> 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. 	
<p><small>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</small></p>	
SPECIAL PROVISIONS	
<p>Special Provisions Nos. _____ to _____, inclusive, are set forth on the reverse side hereof.</p>	
<p>This certificate is effective from _____ to _____, inclusive, and is subject to cancellation at any time upon notice by the Administrator or his authorized representative.</p>	
BY DIRECTION OF THE ADMINISTRATOR	
_____	_____
<small>(Region)</small>	<small>(Signature)</small>
_____	_____
<small>(Date)</small>	<small>(Title)</small>

Figure 18. Typical Air Race Site

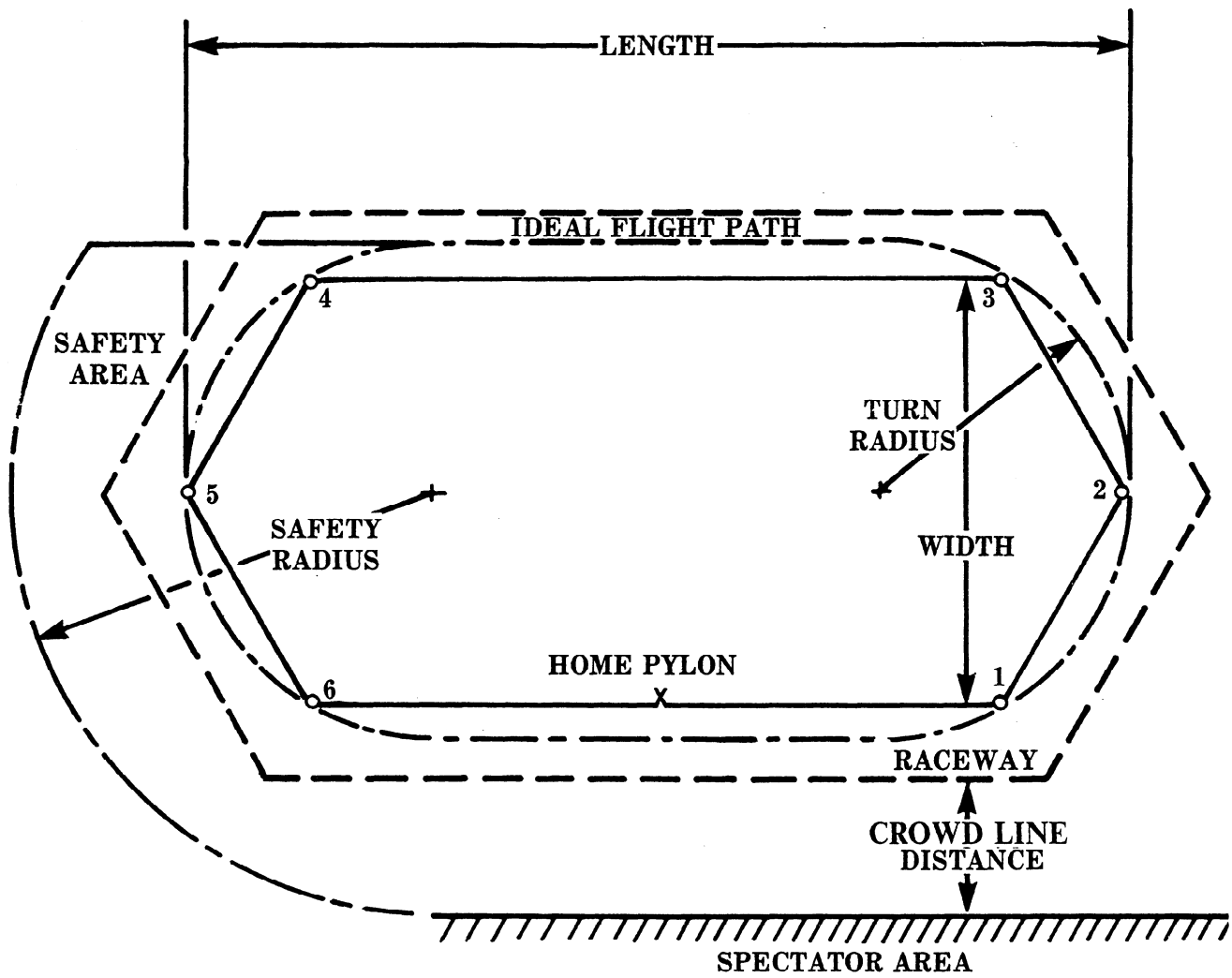


Figure 19. Reno, NV, Race Course

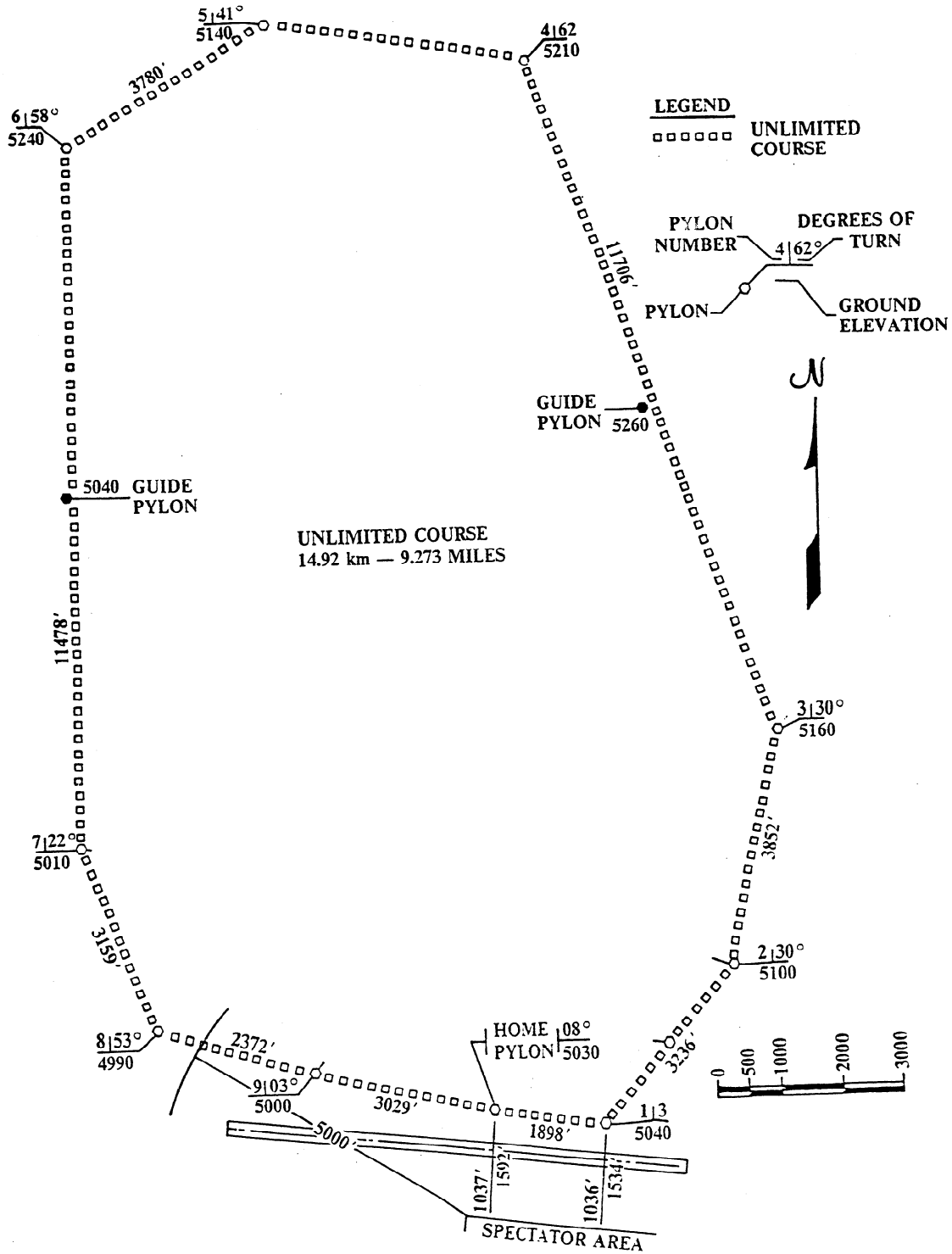


Figure 20. Examples of Air Race Courses

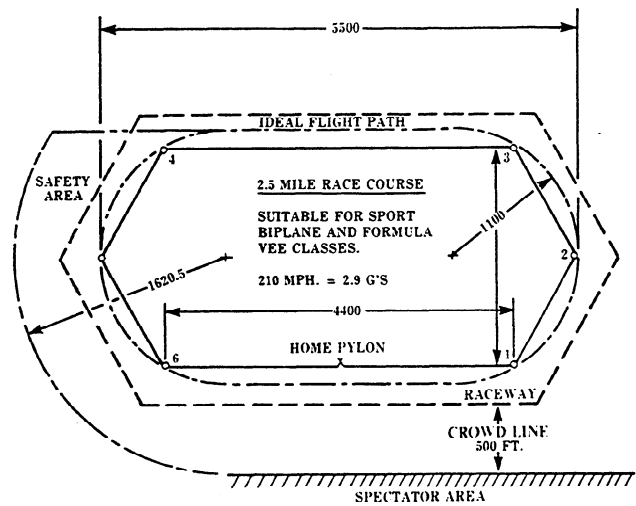
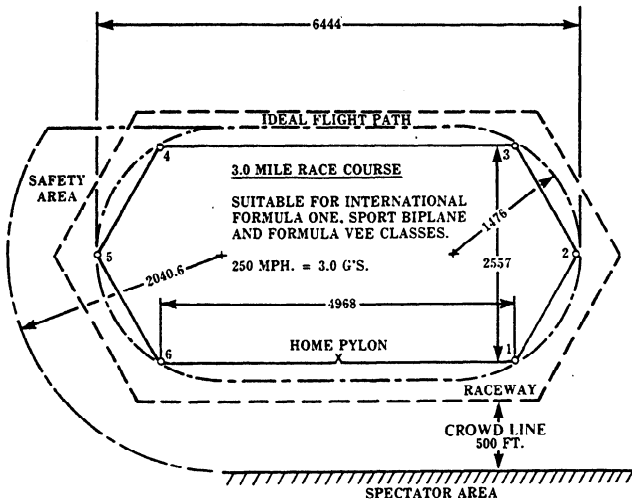
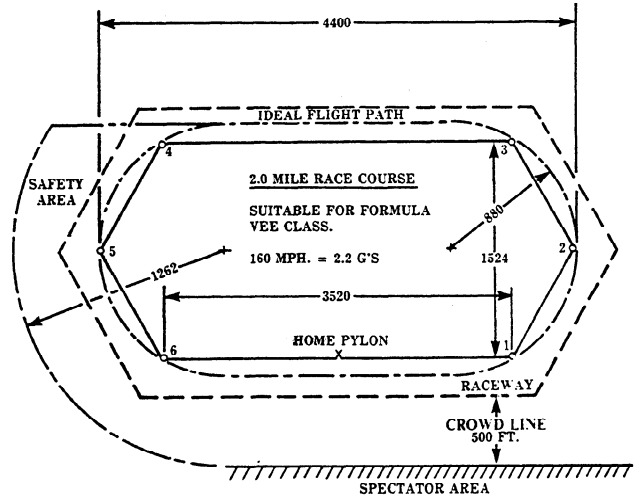
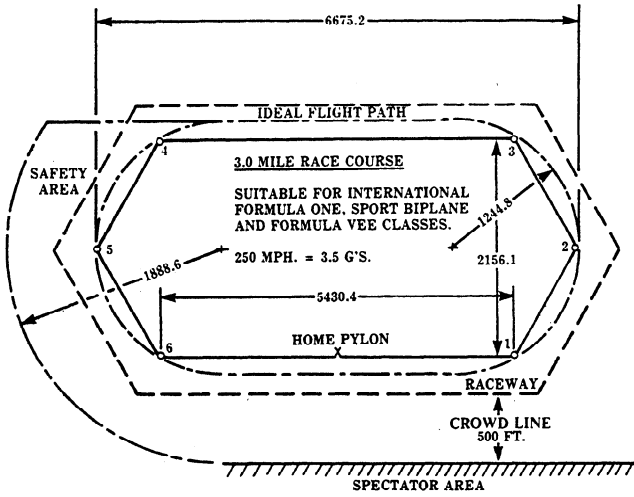


Figure 21. Pylon Air Racing (Race Course Design Parameters)

	Formula Vee	Sport Biplane	AT-6/ SNJ	Int'l Formula 1	Unlimited
1. Maximum Speed (mph)	160.0	210.0	225.0	250.0	450.0
2. Maximum Speed (ft/sec)	234.0	308.0	330.0	336.7	660.0
3. Minimum Turning Radius (R) for 3.5g turn (ft)	509.9	878.4	1008.3	1244.8	4033.3
4. Scatter Distance (S) (ft) 250 altitude	---	---	1300.4	---	4799.1
150 altitude	716.4	940.1	---	1119.3	---
5. Scatter Radius (ft) (Sr) for minimum turn radius	878.9	1286.6	1645.1	1674.0	4799.1
6. Safety Radius (ft) (Sfr) for minimum turn radius	1063.4	1490.7	1964.1	1888.6	5182.0
7. Crowd-to-Showline (ft)	500.0	500.0	500.0	500.0	500.0

Figure 22. Typical Hot Air Balloon

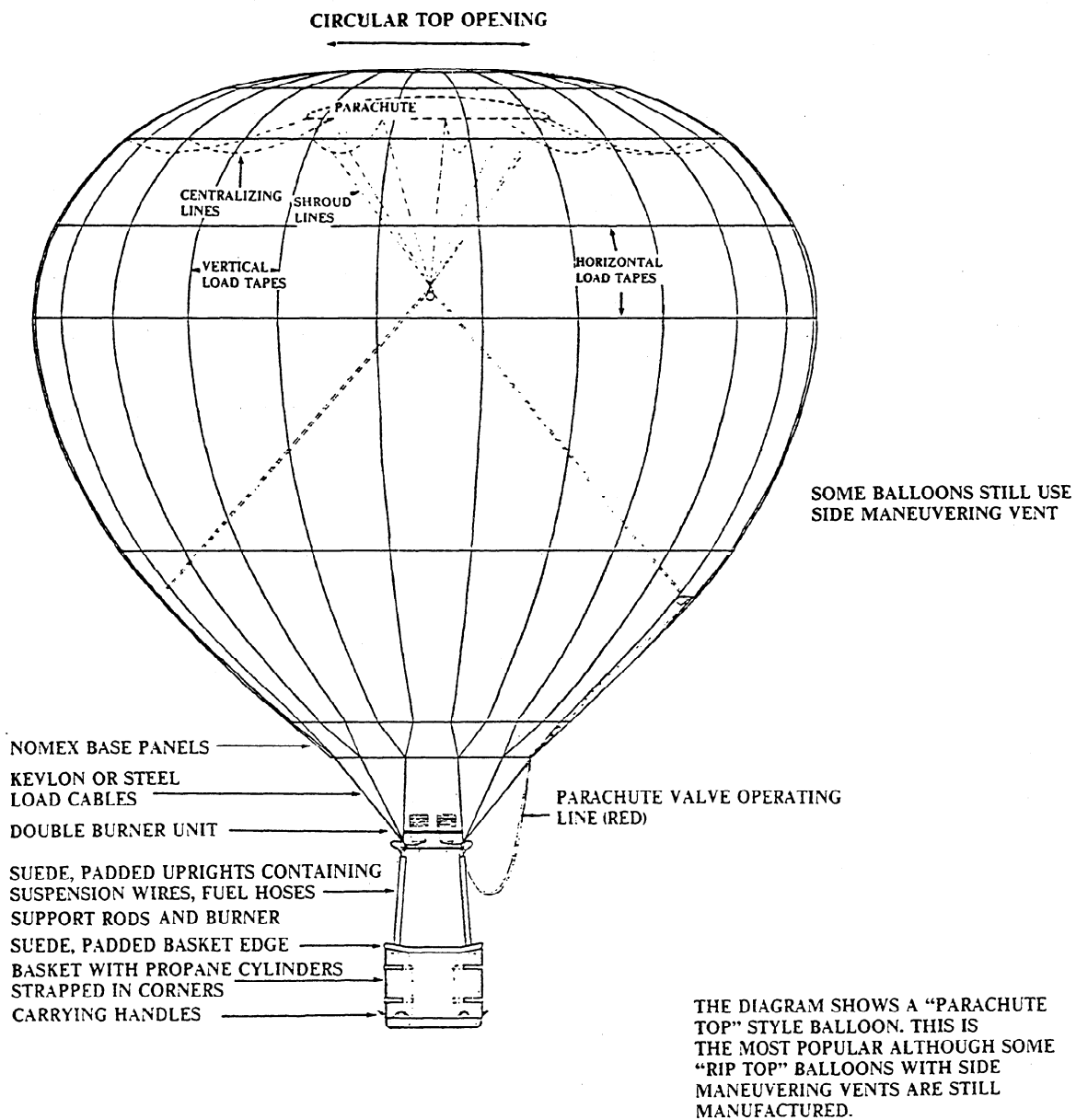


Figure 23. Balloon Terminology

BLAST VALVE	A high pressure fuel valve either full on or full off.
BULK TANK	Used for fuel storage and transfer to supply tanks.
DEFLATION PORT	Refers to the rip panel or envelope section removed for envelope deflation.
DRAG ROPE	A heavy rope tapered and weighted at one end which is used as recoverable ballast.
DROP LINE	A handling line carried in the basket to allow assistance by the ground crew when required.
ENVELOPE	The rubberized fabric or plastic material enclosing the lifting source.
EQUILIBRIUM	That point when lift equals weight and the balloon is neither climbing nor descending.
FALSE LIFT	Refers to the venturi effect of the wind that causes the balloon to lift before true equilibrium is reached.
FUEL	Generally propane.
GORE	Series of panels running from apex to mouth.
LOAD TAPES	Vertical or horizontal stress bearing nylon webbing.
MANEUVERING VENT	The envelope section that can be opened and closed to control the ascent or descent.
PANEL	A fabric section sewn as part of a gore.
PARACHUTE TOP	A combination deflation port and maneuvering vent that is self-sealing when opened in flight.
SKIN TEMPERATURE	The temperature of the fabric envelope.
STEP CLIMB	A series of climbs and level-offs in ascent or descent.
SUPER HEAT	The temperature of the gas inside the envelope exceeding the temperature of the ambient air outside the envelope.
TETHERED	Refers to a balloon on one or more tether lines.

APPENDIX 2. GENERAL PROVISIONS

- a. The holder of the FAA Form 7711-1, Certificate of Waiver or Authorization, shall retain sole responsibility for safeguarding persons and property on the surface and shall inform the issuing FAA office in writing of the person named to ensure overall safety of the event.
- b. The holder of the FAA Form 7711-1 shall ensure that participants are thoroughly briefed on special field rules, manner and order of events, and are available for briefing on the provisions of the waiver before beginning the activities. No person may participate in any event unless that person has received a briefing on the provisions of the waivers.
- c. The holder shall notify the FAA Flight Service Station of the date, time, place, areas, altitudes, nature of the activity, and the duration of the operations and request that a Notice to Airmen (NOTAM) be issued. Such action shall be accomplished at least 48 hours before the event.
- d. All civil aircraft and pilots participating in the demonstration shall be available for FAA inspection before the scheduled event.
- e. For civilian aircraft, only required flight crewmembers (specified in aircraft operating limitations) or those persons actively participating in the demonstration (wingwalkers and stunt persons, etc.) will be carried on any aircraft engaged in demonstrations authorized by this waiver.
- f. A control point shall be established from which the holder, or his or her representative, shall direct the demonstration and be continuously available to the FAA and the person designated as responsible for the overall safety of the event.
- g. A showline (man-made or natural) clearly visible to the performers/pilots shall be provided to assist them in compliance with the approved distances from the spectator area.
- h. Airplanes which operate at speeds of less than 156 knots shall perform no closer than 500 feet horizontally from a spectator area.
- i. Airplanes which operate at speeds of more than 156 knots, but less than 245 knots, shall perform no closer than (safety line distances will be inserted by the FAA FSDO) horizontally from a spectator area. The showline is (geographic description, i.e., runway edge, runway centerline, etc., will be inserted by the FAA FSDO).
- j. Airplanes which operate at speeds of more than 245 knots, and turbojet airplanes, shall perform no closer than (safety line distances will be inserted by the FAA FSDO) horizontally from a spectator area. The showline is (the FAA FSDO will place geographic description in this space).
- k. Helicopters may perform aerobatic maneuvers no closer than 1,000 feet horizontally from a spectator area. These maneuvers are described as a 90° pitch down, split "S," loop, and barrel roll. Performers proposing to use these maneuvers in an airshow must produce evidence of approval by AFS-20.
- l. Helicopters may perform agility maneuvers no closer than 500 feet horizontally from a spectator area. These maneuvers are described as pedal turns, sideward and rearward flight maneuvers, out-of-ground effect hovering, and turns not exceeding 90° of bank.
- m. Helicopters performing aerobatic maneuvers shall have a valid and current special airworthiness certificate issued in the experimental category for the purpose of exhibition. Nothing contained in these general provisions shall contravene any operating or special limitation issued as a part of that special airworthiness certificate.

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- n. All aircraft shall operate at subsonic speed (less than the speed of sound).
 - o. Adequate communications capability (oral or visual) must be provided to advise spectators and participants that the aerial demonstration has been halted or cancelled, or to otherwise communicate to maintain a safe operation.
 - p. A physical barrier and adequate policing shall be provided to confine the spectators to designated areas. The number of personnel involved in crowd control will depend on the type of barrier. (More people will be required for a rope barrier than for a snow fence.)
 - q. The demonstration may be halted when unauthorized persons, vehicles, or aircraft enter the operations area, or for any other reason in the interest of safety. Only those persons necessary to support the operation should be authorized in the operating area. The holder of the FAA Form 7711-1 assumes responsibility for persons that enter the operations area.
 - r. The FAA has the authority to cancel or delete any or all acts or events if, in its opinion, the safety of persons or property on the ground or in the air is in jeopardy, or there is a contravention of the terms of the waiver.
 - s. Aircraft engines shall not be started and aircraft will not be taxied in designated spectator areas or static display areas unless adequate measures are taken to protect the spectators. Areas where engines, propellers, or rotors will be turning must be at least 100 feet from the spectator areas unless they are protected by a barrier that will prevent entry by unauthorized personnel.
 - t. Persons or aircraft not appearing on the FAA Form 7711-2, and approved on the FAA Form 7711-1, may not participate without specific approval by the FAA.
 - u. In the event of an accident considered to be the result of a course deficiency or racing procedure, flight operations will be cancelled until the deficiency has been corrected and accepted by the person designated responsible for the overall safety of the event.

APPENDIX 3. SPECIAL PROVISIONS

- a. Ceiling, visibility, and wind limitations shall be appropriate to the type of exhibitions involved.
- b. Aerobatic maneuvers may not be directed toward any spectator area. Certain related maneuvers and procedures, however, may be authorized as outlined below:
- (1) Rolling 360° turns with a segment toward the spectator area, but beyond the required separation from the showline.
 - (2) "Approved maneuvers" that are completed beyond a point that the rollout and trajectory of the aircraft will not endanger the spectators. "Approved maneuvers" are maneuvers that have been approved by AFS-20 for a specific performer. Upon request from the FAA, performers are required to present evidence of the approval.
 - (3) For military demonstration teams, approved maneuvers may include level or climbing nonaerobatic flight over designated spectator areas; however, in no case shall the altitude of the aircraft be less than 500 feet Above Ground Level (AGL) over a designated spectator area. All other performers must be at 1,000 feet AGL, or above, over designated spectator areas unless they hold approval for the maneuver from AFS-20.
 - (4) Maneuvers on an oblique line that pass 500, 1,000, or 1,500 feet, as appropriate, to either side of a spectator area.
- c. No aerobatic demonstrations shall be authorized or scheduled during such time as a suspension of airport traffic or diversion of other aircraft traffic will cause a hardship to scheduled air carrier operations.
- d. The "arrival demonstration" is not authorized unless an "advance member" of the demonstration team has been briefed on the showline and pertinent special provisions contained in FAA Form 7711-1, Certificate of Waiver or Authorization, and this information has been relayed to the team leader before the arrival demonstration.
- e. The following are some examples of facilities that could be required dependent upon the type of aviation event. They must be readily available at the demonstration site.
- (1) Ambulance (air and/or ground).
 - (2) Firetruck.
 - (3) Crash Wagon.
 - (4) Physician.
 - (5) Other equivalent emergency equipment.
- f. If the event is conducted at an airport, a closed field signal in the form of a large "X," colored aviation yellow, and readily visible from 3,000 feet above the surface must be displayed on the landing areas when the aerial demonstration is in progress. The closed field signal is necessary at most uncontrolled airports, but may not be required at FAA controlled facilities.
- g. The holder of the FAA Form 7711-1 shall ensure that roads under the specified flight maneuvering area are devoid of vehicular traffic or spectators.
- h. Racing flight operations are not authorized when the reported (or observed) flight visibility is less than

3 miles. This value should be adjusted upward for racing speeds above 300 knots.

- i. In the event of an accident considered to be the result of a course deficiency or racing procedures, flight operations will be cancelled until the deficiency has been corrected and accepted by the person designated responsible for the overall safety of the event.
- j. Rotorcraft takeoff and landing areas must be protected in a manner that will prevent unauthorized persons from entering the helipad area. The pads should be located so the aircraft will not pass over spectators during takeoff or landing.
- k. Spectator areas may not be located closer than 500 feet from any takeoff and landing runway/area when the normal landing speed ($1.3 V_{LO}$) of any aircraft is 100 knots or more; 200 feet if speed is less than 100 knots. Airshow acts that involve excessive maneuvering immediately after takeoff, or just before landing, must also be separated from the spectator area by at least 500 feet.

SPECIAL PROVISIONS FOR AEROBATIC COMPETITION/ PRACTICE AREA

- a. This waiver is not valid if the visibility is less than (insert distance) or the ceiling is less than (insert ceiling value). Aerobatic maneuvers shall be conducted at least 1,000 feet below the ceiling.
- b. Each pilot using the aerobatic practice area shall notify (name of Air Traffic facility) by telephone (insert number) at least 30 minutes before operation begins, and again when the flight activity is completed.
- c. Aerobatic flight shall be conducted only between the hours of official sunrise and sunset.
- d. Each pilot using the aerobatic practice area must be briefed by the holder of FAA Form 7711-1 before use on the confines of the waived space and the terms of the waiver.
- e. The holder of FAA Form 7711-1 shall advise the (Name of FSS) Flight Service Station before commencing aerobatic flight operations of the duration of the activity and request that a Notice to Airmen (NOTAM) be issued.
- f. The holder of FAA Form 7711-1 is responsible for the conduct of all aerobatic operations within the operating area. The certificate holder shall also maintain a record of pilots and aircraft using the aerobatic practice area, indicating name, certificate type and number, and aircraft type and registration number.
- g. Before performing any aerobatic sequence, level clearing turns to the left and to the right shall be made and the area scanned thoroughly. Every reasonable action shall be taken to assure that the area is clear before executing any aerobatic maneuver.
- h. The holder of FAA Form 7711-1 has the responsibility to halt or cancel activity if at anytime the safety of persons or property on the ground or in the air is in jeopardy, or if there is a contravention of the terms or conditions of the waiver. The pilot is responsible for halting operations if unauthorized persons enter the operating area.
- i. For waivers involving aerobatic practice areas, the holder of the FAA Form 7711-1 must obtain, and hold on a continuing basis throughout the duration of this waiver, the permission of the airport manager and the property owner over which aerobatic flights are being conducted.
- j. Aerobatics conducted under the provisions of this waiver are limited to those aircraft and pilots approved by appointed officials named by the applicant on FAA Form 7711-2. Such approving officials shall assure that:

- (1) Each aircraft using the area is airworthy and properly certificated.
 - (2) Pilots using the area are properly certificated and briefed on the confines of the waived airspace and terms of the waiver.
- k. Mr./Ms. _____ shall ensure that participants are thoroughly briefed on the provisions of this waiver.

SPECIAL PROVISIONS FOR PARACHUTE DEMONSTRATION JUMPS

- a. For jumps into congested areas, two-way radio communication between the aircraft airlifting the parachutists and the landing area shall be continuously maintained for all jumps.
- b. Provisions shall be made by the holder of FAA Form 7711-1 to keep spectators out of the landing area.
- c. The parachute jump shall not be conducted when the ceiling is less than 2,500 feet and the visibility less than 5 miles.
- d. Use the appropriate landing area provision based on the qualifications of the jumper. Landing areas will be divided into two distinct categories:
 - (1) Parachutists who hold a USPA Class C or D license, or are members of a DOD-sanctioned parachute demonstration team, must select a landing area that will permit the jumper to land not closer than 50 feet from any spectator and will not involve passing over persons on the surface at an altitude of less than 250 feet.
 - (2) Parachutists who hold a USPA Class D license with an exhibition rating, or are members of a DOD-sanctioned parachute demonstration team, who certify that they will use a steerable square main and reserve canopy, will be permitted to exit over or into a congested area. The selected landing area must not permit the jumper to land closer than 15 feet from any spectator and will not involve passing over persons on the surface at an altitude of less than 50 feet.
- e. The holder of FAA Form 7711-1 shall brief the pilot in command of the aircraft and the jumpers on the terms of this authorization.
- f. The FAA inspector may wish to develop a provision that directs the pilot in command or the holder of FAA Form 7711-1 to use a specific Air Traffic Control facility and frequency.

SPECIAL PROVISIONS FOR BALLOON EVENTS

- a. FAR §§ 91.79 (b) and (c) are waived to the extent necessary to allow participating balloons to compete in (insert the name of the balloon event here) under the terms and conditions set forth in the FAA-approved procedures section of the (insert the name of the balloon event manual here).
- b. The (insert the name of the balloon event manual) is incorporated into this FAA Form 7711-1 and becomes a special provision thereof. A contravention of the terms, controls, procedures, and conditions pertaining to safety set forth in the FAA-approved procedures could be the basis for cancellation of this waiver.
- c. The holder of FAA Form 7711-1 shall ensure that each participating flight crewmember has read and understands the FAA-approved procedures section of the (insert the name of the balloon event manual) and the special provisions of this waiver.

